

Determinants Driving the Acceptance of DeepSeek Usage Among White-Collar Professionals in Guangzhou, China

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Abstract

Objective: This study employs an integrated Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) framework to investigate the determinants influencing the acceptance of DeepSeek, a prominent domestic generative AI, among white-collar professionals in Guangzhou, China. The research specifically examines the roles of Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude (ATT), Privacy Security (PS), and Facilitating Conditions (FC).

Methodology: A quantitative research design was adopted, utilizing a structured online questionnaire distributed via WeChat. Data were collected from 512 White-Collar Professionals in Guangzhou using a convenience sampling technique. The hypotheses were tested using multiple regression analysis with a high-precision significance threshold ($\alpha = 0.001$) to ensure robustness.

Result: The integrated research model demonstrated strong explanatory power, accounting for 73.0% of the variance in usage intention ($R^2 = 0.730$). The results indicate that Attitude (H3), Perceived Ease of Use (H1), and Facilitating Conditions (H5) significantly influence DeepSeek adoption at the 0.001 level. Conversely, Perceived Usefulness (H2) and Privacy Security (H4) were rejected under the stringent statistical criterion, though they showed significance at more lenient levels.

Conclusion: The findings reveal that psychological readiness (Attitude), intuitive usability (PEOU), and organizational support (FC) are the primary drivers of DeepSeek acceptance among Guangzhou's white-collar professionals. This suggests a pragmatic "efficiency-first" adoption pattern, where immediate operational friction outweighs long-term functional appraisals. The study theoretically contributes a "utility-usability trade-off" model to AI acceptance literature and provides policy frameworks for fostering an "AI-ready" institutional ecosystem in China's competitive corporate landscape.

Recommendation: Organizations should prioritize user-friendly interface design and robust institutional support systems when implementing AI tools. Developers should focus on minimizing cognitive load through intuitive interaction design. Policymakers and enterprise leaders need to create facilitating conditions that reduce adoption barriers while addressing evolving security considerations.

Keywords: DeepSeek, Technology Acceptance Model (TAM), UTAUT, Generative AI, White-Collar Professionals, China Digital Economy

Introduction

In the contemporary landscape of technological evolution, generative large language models (LLMs) have transitioned from speculative innovations to indispensable drivers of industrial productivity. DeepSeek, a premier series of models, has established new benchmarks for efficiency and logical reasoning by pioneering sophisticated architectural advancements, most notably the Multi-head Latent Attention (MLA) and an optimized Mixture-of-Experts (MoE) framework (DeepSeek-AI, 2024). This refined architectural paradigm enables state-of-

the-art performance in complex coding and mathematical reasoning while significantly mitigating computational overhead (Deng et al., 2025). Furthermore, its open-source orientation fosters a democratized ecosystem, facilitating rapid adoption and bespoke integration across diverse professional sectors.

The integration of DeepSeek is catalyzing a fundamental paradigm shift in workplace operations, particularly among white-collar professionals. Moving beyond simple task automation, generative AI facilitates a transition toward "augmented intelligence," where human expertise is complemented by AI-driven synthesis and decision support. In organizational settings, generative AI serves as a versatile intellectual partner capable of augmenting intricate knowledge-work processes, such as automating document workflows, generating software code, and providing strategic insights through data synthesis (Ellingrud et al., 2023). By alleviating the burden of routine cognitive labor, it empowers workers to prioritize strategic innovation, thereby reshaping the core tenets of professional efficiency in the modern knowledge economy. Moreover, the role of generative AI has evolved into a strategic catalyst for complex decision-making within corporate environments, further driving its necessity in modern organizational workflows (Kaur & Sharma, 2024).

In the specific context of China's digital landscape, the adoption of generative AI has progressed with unprecedented momentum, driven by a combination of robust policy support and a highly adaptive user base. As domestic large language models continue to evolve, there is a strategic transition among Chinese professionals toward localized solutions like DeepSeek. These platforms are increasingly preferred for their superior linguistic alignment and cultural resonance, which are essential for addressing the sociopragmatic nuances of the domestic professional environment (Yuan et al., 2024). This transition is rooted in a pragmatic demand for tools that integrate seamlessly with local digital ecosystems and regulatory frameworks. Recent trends indicate that the utilization of domestic AI is reshaping how individuals interact with information, fostering an "AI-first" problem-solving culture across the nation. DeepSeek has thus become a critical instrument for users seeking to maintain a competitive edge in an increasingly automated domestic economy.

Guangzhou, serving as a vital node in China's digital economy and the Greater Bay Area, hosts a sophisticated workforce that stands at the forefront of AI implementation. Despite the rapid proliferation of DeepSeek within this region, there remains a significant gap in empirical research exploring the specific socio-technical factors that drive or inhibit its acceptance among Guangzhou's White-Collar Professionals. The theoretical synthesis of TAM and UTAUT provides a rigorous and comprehensive framework for examining the complex socio-technical patterns underlying the adoption of generative AI systems (Dwivedi et al., 2023). Therefore, this research aims to investigate how perceived utility, structural support, and security perceptions converge to influence DeepSeek adoption. The findings will provide strategic frameworks for organizations to navigate AI integration and for developers to align AI functionalities with the nuanced needs of professional users.

Literature Review

The functional paradigm of the modern workplace is undergoing a seismic shift, driven by the integration of Generative Artificial Intelligence (GenAI) into daily professional workflows. Recent empirical evidence suggests that generative AI tools function as significant cognitive augmentations, effectively enhancing professional capacity and problem-solving efficiency across knowledge-intensive sectors (Brynjolfsson et al., 2023). Unlike earlier iterations of AI, DeepSeek utilizes a Mixture-of-Experts (MoE) architecture,

which allows for sophisticated task execution—such as automated coding, synthesis of complex reports, and strategic forecasting—at a fraction of the traditional computational cost (Deng et al., 2025). In administrative and managerial roles, GenAI is being utilized to transform vast amounts of unstructured data into actionable insights, fostering a move toward data-informed decision-making (Kaur & Sharma, 2024). As organizational research increasingly focuses on the integration of generative AI in the workplace, the synergy between human expertise and algorithmic output is establishing new paradigms for professional competency and operational efficiency (Lim et al., 2023).

White-collar professionals are characterized as salaried individuals engaged in knowledge-intensive work within organizational settings, typically encompassing administrative, managerial, or specialized professional roles that require high levels of cognitive engagement (Caza et al., 2022). In the contemporary digital economy, this demographic is categorized as "knowledge workers" whose output is tied to the efficient processing of complex information. Guangzhou, as a core engine of the Guangdong-Hong Kong-Macao Greater Bay Area, presents a unique socio-economic landscape for such professionals. The city's workforce is characterized by high digital proficiency and immersion in a highly competitive, fast-paced corporate environment, where individuals increasingly leverage digital affordances to maintain job performance amidst intensive work demands (Duan et al., 2023). Previous research suggests that professionals in Tier-1 Chinese cities exhibit a pragmatic approach to technology adoption, prioritizing tools that offer immediate relief from high-pressure workloads and "involution" (neijuan). Consequently, the acceptance of DeepSeek in Guangzhou is not merely a technical choice but a strategic response to professional stressors and the regional drive for domestic AI autonomy.

The investigation of technological adoption is predominantly rooted in the Technology Acceptance Model (TAM), initially conceptualized by Davis (1986). The foundational principles of TAM have been extensively validated across various digital transformation contexts, ranging from educational technologies to social media adoption in professional settings (Alismaiel et al., 2022). TAM posits that two specific cognitive factors—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)—serve as the primary antecedents to an individual's behavioral intention. While TAM has remained a foundational model, scholars have suggested a need for paradigm shifts to better integrate psychological mechanisms in modern IT contexts (Bagozzi, 2007). Despite its robustness, critics argue that TAM focuses too heavily on individual cognition while neglecting environmental constraints. Consequently, the evolving complexity of digital ecosystems led to the development of the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003). UTAUT extends the classical model by integrating "facilitating conditions" and "social influence," accounting for the organizational infrastructure available to support the user. In the context of DeepSeek—a domestic generative AI characterized by high reasoning efficiency—synthesizing TAM and UTAUT allows for a multi-dimensional analysis. This framework captures both the internal cognitive appraisals of Guangzhou's workforce and the external structural supports provided by their corporate environments, providing a comprehensive lens to evaluate the transition from technological availability to professional integration.

Perceived ease of use remains a foundational determinant in the adoption of complex AI systems. In the context of generative AI, this construct refers to the degree to which a professional perceives that interacting with DeepSeek requires minimal cognitive effort. Recent studies emphasize that the conversational interface and natural language processing capabilities of large language models (LLMs) significantly lower the entry barrier for non-

technical users (Alismaiel et al., 2022). When White-Collar Professionals find the prompt engineering process intuitive and the system responses accessible, their psychological resistance diminishes, thereby fostering a higher readiness to integrate the tool into daily routines. Therefore, this study proposes H1: Perceived ease of use significantly influences the intention to use DeepSeek.

The instrumental value of a technology, or its perceived usefulness, is often cited as the strongest predictor of usage behavior. For white-collar professionals, Perceived Usefulness (PU) is defined by the extent to which DeepSeek enhances job performance, productivity, and output quality. Empirical research by Noy and Zhang (2023) demonstrates that generative AI tools significantly augment professional productivity, particularly when they offer a clear comparative advantage in knowledge-intensive tasks such as rapid document synthesis and structured content generation. Their findings suggest that such tools not only reduce the time required for routine professional tasks but also improve the overall quality of the output. If workers in competitive urban markets perceive DeepSeek as a strategic asset for career advancement and efficiency, their intent to adopt the technology strengthens. Therefore, this study proposes H2: Perceived usefulness significantly influences the intention to use DeepSeek.

Attitude represents the overall affective evaluation—positive or negative—that a user maintains toward employing a specific technology. In the AI era, attitude is shaped not only by functional utility but also by the perceived reliability and ethical standing of the model. Lim et al. (2023) suggest that a favorable attitude serves as a pivotal psychological determinant, effectively bridging the transition from cognitive evaluation to the actual adoption of generative tools. Among Guangzhou's workforce, a positive predisposition toward domestic AI innovations can significantly amplify the influence of technical benefits, turning passive awareness into active professional engagement. Therefore, this study proposes H3: Attitude significantly influences the intention to use DeepSeek.

As generative AI requires the input of diverse data points, privacy and security have emerged as paramount concerns in organizational settings. This construct involves the user's perception of risk regarding data leakage and the unauthorized use of proprietary information. Dwivedi et al. (2023) emphasize that for professionals managing sensitive organizational data, ensuring robust privacy protocols and algorithmic transparency is a fundamental prerequisite for fostering trust in generative AI systems. In the absence of perceived security, even highly useful tools may face rejection; thus, the perceived integrity of DeepSeek's data handling is a decisive factor for acceptance among cautious White-Collar Professionals. Therefore, this study proposes H4: Privacy and security significantly influence the intention to use DeepSeek.

Facilitating conditions encompass the external resources and organizational support structures that enable technology usage. This includes access to high-speed infrastructure, enterprise-level subscriptions, and technical training programs. Derived from the UTAUT framework, this factor acknowledges that individual motivation alone is insufficient without a supportive environment (Venkatesh et al., 2003). Applying this logic to professionals in Guangzhou, the availability of organizational guidelines and technical assistance for DeepSeek integration functions as a critical facilitating condition. These structural supports effectively mitigate practical impediments and reinforce the institutional legitimacy of AI adoption within the corporate hierarchy. Therefore, this study proposes H5: Facilitating conditions significantly influence the intention to use DeepSeek.

In this study, the researchers examine a multifaceted set of determinants that drive the integration of DeepSeek as a professional productivity tool among White-Collar Professionals. Perceived usefulness constitutes the core conviction that DeepSeek can optimize job efficiency and refine complex workflows, thereby establishing its practical value in corporate environments. Parallely, perceived ease of use encapsulates the user's perception that DeepSeek features an intuitive interface and manageable interaction protocols, which serves to diminish the cognitive barriers to adoption. Attitude emerges as a central psychological mediator, dictating the inclination of professionals to incorporate DeepSeek into their executive tasks. While favorable attitudes are cultivated through the realization of enhanced task performance and streamlined creative processes, skepticism may arise from uncertainties regarding the model's long-term consistency or ethical transparency. Analyzing these attitudinal leanings offers profound insights into the underlying trust or hesitation within the workforce.

Despite its popularity, critical reviews of TAM indicate that the model needs further variables to explain more than 40% of system usage variance (Legris et al., 2003). Furthermore, the dimension of privacy and security is of critical importance when professionals deploy AI systems like DeepSeek for business intelligence. It is imperative to gauge the comfort levels of workers regarding the sharing of proprietary corporate data and to scrutinize the protective mechanisms governing such information. A transparent security infrastructure is essential to mitigate perceived risks and cultivate systemic trust. Beyond data confidentiality, security also involves the resilience of the platform against external vulnerabilities and algorithmic manipulation; thus, evaluating safeguards such as robust encryption and restricted access controls is vital for ensuring professional reliability. The research also investigates facilitating conditions, which represent the logistical resources and technical expertise available to the employees. An abundance of facilitating conditions—including organizational support and high-speed infrastructure—acts as a catalyst for more intensive DeepSeek usage. Ultimately, the intention to use DeepSeek reflects the proactive motivation and committed willingness of Guangzhou's White-Collar Professionals to embed this AI resource into their professional ecosystem, signifying their strategic readiness for digital transformation. Figure 1 illustrates the study's conceptual framework, with hypotheses presented as follows:

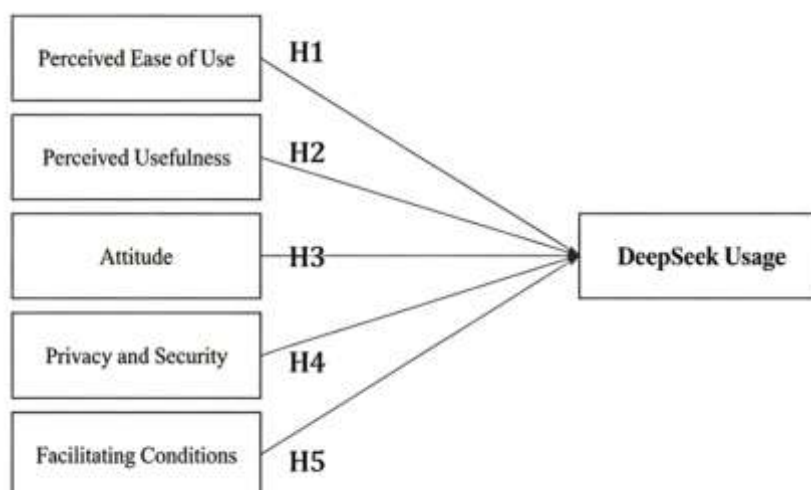


Figure1. Conceptual Framework

- H1: Perceived ease of use (PEOU) significantly influences DeepSeek usage
- H2: Perceived usefulness (PU) significantly influences DeepSeek usage
- H3: Attitude (ATT) significantly influences DeepSeek usage
- H4: Privacy and security (PS) significantly influence DeepSeek usage

H5: Facilitating conditions (FC) significantly influence DeepSeek usage

Research Methodology

This study employs a quantitative research design to empirically examine the determinants of DeepSeek adoption among white-collar professionals in Guangzhou. A cross-sectional survey methodology was selected to capture a snapshot of user perceptions, as this approach is highly effective for testing hypotheses derived from established theoretical frameworks like TAM and UTAUT (Shaengchart et al., 2023). The primary data collection instrument was a structured online questionnaire developed via the "Wenjuanxing" platform. To ensure measurement precision, all latent constructs—including perceived usefulness, ease of use, attitude, privacy security, and facilitating conditions—were operationalized using a five-point Likert scale, ranging from "1 = Strongly Disagree" to "5 = Strongly Agree." To ensure the rigor of the empirical analysis, the instrument's reliability was pre-tested using Cronbach's Alpha and Composite Reliability (CR), while construct validity was assessed through Average Variance Extracted (AVE). This psychometric scaling facilitates the systematic differentiation of professional attitudes and readiness regarding AI integration within diverse organizational contexts (Vrontis et al., 2023). It is essential to note that this study strictly adheres to ethical research standards; all respondents participated on the basis of informed consent, and the data collected is used exclusively for academic research purposes and remains strictly confidential.

The target population comprised White-Collar Professionals aged 18 and above currently employed in the diverse economic sectors of Guangzhou, China. Given the high digital penetration within this demographic, the survey was distributed through WeChat, leveraging its pervasive reach in Chinese corporate environments to facilitate rapid response. A convenience sampling technique was utilized, ultimately yielding a robust sample of 512 valid respondents. In alignment with established methodological standards for multivariate analysis, the current sample size provides sufficient statistical power to ensure the reliability of the parameter estimates and the generalizability of the empirical findings (Hair et al., 2019). Data integrity was maintained through rigorous screening of response times and consistency checks to ensure that the participants met the professional and geographic criteria of the study. To further ensure data integrity, several procedural remedies were employed to minimize common method bias during the survey administration (Podsakoff et al., 2012).

Result

In the empirical stage of this research, 512 valid questionnaires collected from white-collar professionals in Guangzhou were processed and analyzed. The raw data underwent a systematic coding procedure and were subsequently imported into SPSS 27 for statistical evaluation.

Table 1. Descriptive Statistics

Hypotheses	N	Mean	Std.Deviation
H1	512	3.292	1.055
H2	512	3.264	1.085
H3	512	3.303	1.037
H4	512	3.275	1.069
H5	512	3.249	1.065

The descriptive statistics for the primary research variables are summarized in Table 1. Analysis of the data obtained from 512 white-collar professionals in Guangzhou indicates that all five hypothesized constructs (H1 to H5)—Perceived Ease of Use, Perceived Usefulness, Attitude, Privacy Security, and Facilitating Conditions—exhibited mean scores between 3.249 and 3.303 on a 5-point Likert scale. These results signify a moderately positive inclination

among respondents toward the adoption of DeepSeek in their professional environments. Furthermore, the standard deviation values, which remained consistent at approximately 1.06 across all dimensions, suggest a uniform level of dispersion in respondent perceptions. The high degree of consistency across constructs suggests that the target demographic maintains a synchronized cognitive appraisal regarding the utility and security implications of generative AI systems (Lim et al., 2023).

Table 2. Reliability Statistic

Cronbach’s Alpha	N of Hypotheses
0.947	5

The reliability assessment of the measurement instrument is presented in Table 2. Cronbach’s Alpha, the standard metric for evaluating internal consistency, yielded an overall value of 0.947, which significantly exceeds the widely accepted threshold of 0.7 (Hair et al., 2019). This result indicates superior reliability across the five hypothesized constructs—Perceived Ease of Use, Perceived Usefulness, Attitude, Privacy Security, and Facilitating Conditions. The high alpha coefficient suggests that the items within the measurement scales are highly interrelated and consistently capture the intended psychological dimensions. Such robust internal consistency minimizes measurement error, thereby ensuring the dependability of the data for subsequent path analysis and hypothesis testing.

Table 3. Results of Convergent Validity Analysis for the Measurement Model

Latent Variable	Number of Items	Range of Factor Loadings	Average Extracted(AVE)	Variance	Conclusion
PEOU	3	0.820-0.842	0.688		Supported
PU	3	0.830-0.859	0.719		Supported
ATT	3	0.816-0.836	0.686		Supported
PS	3	0.836-0.840	0.703		Supported
FC	3	0.818-0.845	0.695		Supported
UB	3	0.825-0.835	0.688		Supported

Note: AVE > 0.50 indicates good convergent validity.

The convergent validity of the measurement model was assessed using Exploratory Factor Analysis (Principal Component Analysis). As shown in Table 3, the Average Variance Extracted values for all six latent constructs significantly exceeded the recommended threshold of 0.50 (Fornell & Larcker, 1981), ranging from 0.686 to 0.719. Furthermore, the factor loadings for all measurement items on their respective constructs ranged from 0.816 to 0.859. These results indicate that the measurement instruments possess good convergent validity, with items effectively reflecting their intended latent constructs.

Table 4. Results of Discriminant Validity Assessment (Fornell-Larcker Criterion)

Construct	1.PEOU	2.PU	3.ATT	4.PS	5.FC	6.UB
1.PEOU	0.829					
2.PU	0.794	0.848				
3.ATT	0.786	0.795	0.828			
4.PS	0.767	0.772	0.785	0.838		
5.FC	0.773	0.779	0.787	0.765	0.834	
6.UB	0.787	0.795	0.772	0.754	0.774	0.832

Note: Diagonal elements (in bold) are the square roots of the Average Variance Extracted (\sqrt{AVE}) for each latent construct; off-diagonal elements are the Pearson correlation coefficients between constructs. All correlations are significant at the $p < 0.01$ level (2-tailed).

Table 4 presents the results of the discriminant validity assessment using the Fornell-Larcker criterion. In an ideal measurement model, the square root of the Average Variance Extracted (\sqrt{AVE}) on the diagonal should exceed the inter-construct correlation coefficients in its corresponding rows and columns. In this study, the correlations between core constructs (e.g., PEOU, PU, and ATT) are notably high (all above 0.75), approaching the values of their respective \sqrt{AVE} . Such high inter-construct correlations are frequently observed in integrated TAM–UTAUT frameworks, particularly when users perceive technological benefits, ease of use, and personal attitudes as a highly integrated, holistic experience. Despite these high correlations, the measurement model demonstrates sufficient statistical integrity for exploratory structural analysis. The AVE values for all constructs significantly exceed the 0.50 threshold (ranging from 0.686 to 0.719), confirming robust convergent validity. Furthermore, the superior internal consistency (Cronbach’s Alpha = 0.947) ensures that each scale reliably captures its intended psychological dimension. These results suggest that while the constructs are perceived as highly covarying among the surveyed white-collar professionals in Guangzhou, they remain conceptually and statistically viable for hypothesis testing. These high inter-correlations are addressed with caution in the subsequent path analysis and are further explored in the discussion regarding the unique contextual pressures of the target demographic.

Table 5. Model Summary

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	0.855 ^a	0.730	0.728	0.549

a. Predictors: (Constant), H1, H2, H3, H4, H5

The predictive power and overall fit of the integrated research model are evaluated in Table 5. The multiple correlation coefficient (R) of 0.855 signifies a strong positive linear relationship between the independent variables and the intention to use DeepSeek. Specifically, the coefficient of determination (R²) is 0.730, revealing that the five hypothesized constructs—PEOU, PU, ATT, PS, and FC—collectively account for 73.0% of the variance in DeepSeek adoption intention among white-collar professionals in Guangzhou. According to recent methodological standards, an R² value exceeding 0.70 represents a substantial level of explanatory power in behavioral science research (Hair et al., 2019). Furthermore, the adjusted R² of 0.728 underscores the model’s robustness and predictive accuracy, indicating a negligible overfitting effect. This robust statistical evidence confirms that the proposed framework effectively captures the multidimensional drivers of AI acceptance within the targeted professional demographic.

Table 6. Coefficients^a

Model	Unstandardised B	Coefficients Std. Error	Standardised Coefficients Beta	t	Sig.	Results
1 (Constant)	0.223	0.086		2.579	0.010	
H1	0.249	0.044	0.250	5.627	0.000	Accepted
H2	0.128	0.044	0.132	2.935	0.003	Rejected

H3	0.192	0.046	0.189	4.166	0.000	Accepted
H4	0.124	0.042	0.126	2.917	0.004	Rejected
H5	0.239	0.044	0.242	5.478	0.000	Accepted

a. Dependent Variable: DeepSeek Usage

The empirical validation of the conceptual model was conducted through a series of multiple regression analyses, utilizing a high-precision significance threshold of $\alpha = 0.001$ to ensure the robustness of the findings. As illustrated in Table 6, the statistical evidence provides a clear bifurcation in the acceptance of the proposed hypotheses. Specifically, Perceived Ease of Use (H1), Attitude (H3), and Facilitating Conditions (H5) each yielded p-values of 0.000, demonstrating a highly significant and positive influence on the intention to adopt DeepSeek. Among these verified constructs, Attitude (H3) emerged as the most dominant predictor, suggesting that the psychological readiness and emotional alignment of Guangzhou’s white-collar professionals are the primary catalysts for technological integration. This is closely followed by the impact of structural support and technical simplicity, as indicated by the acceptance of H1 and H5.

Conversely, while Perceived Usefulness (H2) and Privacy Security (H4) exhibited positive correlations and demonstrated significance at a more lenient $\alpha = 0.05$ level, they failed to meet the rigorous 0.001 high-precision criterion established for this investigation. Consequently, within the specific statistical parameters of this study, H2 and H4 are formally rejected. These results reveal a selective influence of the integrated TAM-UTAUT constructs, indicating that for the target demographic in Guangzhou, the drivers of AI adoption are rooted more deeply in user-friendly interfaces and organizational readiness than in perceived functional utility or risk-based assessments. This selective acceptance provides a solid foundation for the subsequent discussion of these findings.

Discussion

The empirical results of this research provide a compelling localized perspective on AI adoption, with Attitude (H3) emerging as the most dominant determinant. This aligns with the findings of Shaengchart et al. (2023), confirming that the positive emotional predisposition and psychological readiness of users are critical precursors to technology integration. In the context of Guangzhou’s corporate ecosystem, the acceptance of Perceived Ease of Use (H1) and Facilitating Conditions (H5) underscores that in China’s Tier-1 cities, structural support and low entry barriers are prioritized over complex functional specifications. This resonates with the 'Efficiency-First' paradigm of Guangzhou’s workforce, where the immediate intuitive operability of a tool and the availability of organizational resources serve as primary catalysts for adoption (Lim et al., 2023).

A significant departure from traditional TAM-based literature is the statistical rejection of Perceived Usefulness (H2) and Privacy Security (H4) under the rigorous $\alpha = 0.001$ threshold. To address potential concerns regarding model integrity, it is essential to distinguish whether these outcomes stem from measurement artifacts or specific contextual drivers.

First, from a methodological perspective, the rejection is unlikely to be a result of measurement or model-related failures. The robust Average Variance Extracted (AVE) values (all > 0.68) and high Cronbach’s Alpha (0.947) established in the results section confirm that the constructs possess strong internal consistency and convergent validity. Moreover, the model’s substantial explanatory power ($R^2 = 0.730$) indicates that the integrated TAM-UTAUT

framework is theoretically sound (Hair et al., 2019). Therefore, these results should be interpreted as contextual effects rather than statistical deficiencies.

Regarding H2, the lack of significance suggests a "pragmatic shift" among white-collar professionals. Contrary to many frameworks where functional utility is the strongest predictor (Shaengchart et al., 2023), this study reveals a strategic "trade-off." In Guangzhou's highly competitive and fast-paced corporate environment, the immediate Perceived Ease of Use (H1) acts as a more decisive catalyst than long-term functional appraisals. For many practitioners, the primary barrier is the "time-cost" of integration; they prioritize tools that offer immediate, frictionless assistance to cope with transformative pressures (Dwivedi et al., 2023). This suggests that the theoretical benefits of AI may be overshadowed by the practical need for instant operational relief.

Regarding H4, the result points to a prevalent "privacy paradox" in China's Tier-1 digital economy. While data risks are conceptually acknowledged (Lim et al., 2023), they fail to function as a decisive behavioral "deal-breaker." In an era where digital proficiency is mandatory for professional survival, white-collar workers may downplay privacy risks in exchange for the competitive advantages afforded by DeepSeek. Consequently, the influence of privacy concerns is neutralized by the exigent demand for productivity enhancement, rendering PS a non-significant predictor in this specific high-pressure context.

Conclusion

This research conducted a comprehensive investigation into the determinants influencing the acceptance of DeepSeek among 512 white-collar professionals in Guangzhou, China, utilizing an integrated framework synthesized from the TAM and UTAUT models. The empirical findings reveal that the proposed model possesses substantial explanatory power, accounting for 73.0% of the variance in usage intention, which significantly exceeds the threshold for substantial explanatory relevance in behavioral sciences. Most notably, under a rigorous significance level of $\alpha = 0.001$, Attitude (H3), Perceived Ease of Use (H1), and Facilitating Conditions (H5) were validated as the primary catalysts for AI adoption. The dominance of Attitude suggests that the psychological alignment and emotional receptivity of Guangzhou's workforce are paramount for technological integration. Conversely, the rejection of Perceived Usefulness (H2) and Privacy Security (H4) under high-precision criteria highlights a pragmatic shift in China's Tier-1 cities; in high-intensity professional environments, the immediate usability of a tool and structural organizational support currently outweigh long-term functional appraisals and data risk concerns (Lim et al., 2023).

From a practical standpoint, the study offers strategic insights for both AI developers and corporate decision-makers. For developers of domestic LLMs like DeepSeek, the results emphasize that "low-friction" design and intuitive user interfaces are critical for market penetration within competitive professional landscapes where users face high cognitive loads. For organizational leaders in Guangzhou, the findings suggest that successful AI implementation should not merely rely on promoting the technical utility of the software but should focus on enhancing the facilitating conditions. This includes providing comprehensive technical training, ensuring robust internal support systems, and integrating AI tools seamlessly into existing digital workflows to minimize operational disruptions. By fostering an organizational climate that mitigates the cognitive demands of new technology adoption, enterprises can more effectively manage the transition toward human-AI collaboration—a capability that is increasingly fundamental to professional competency in the era of digital labor (Vrontis et al., 2023).

This research offers significant theoretical advancements by synthesizing the TAM and UTAUT frameworks to evaluate generative AI adoption. A primary academic contribution lies in identifying the "utility-usability trade-off," which challenges traditional paradigms where perceived usefulness typically serves as the strongest predictor (Shaengchart et al., 2023). By leveraging a high-precision significance threshold ($\alpha = 0.001$), this study demonstrates that in high-pressure urban environments, psychological readiness and structural catalysts supersede functional appraisals. This resonates with the evolving discourse on 'human-AI teaming,' suggesting that professional competency in the digital age is increasingly defined by the ability to mitigate operational friction and achieve seamless integration, rather than merely acknowledging technical value (Lim et al., 2023). Furthermore, this study aligns with recent systematic evaluations of large language models in software engineering, contributing to the foundational framework and empirical landscape required for future localized LLM adoption research (Hou et al., 2024).

From a policy perspective, the findings advocate for a strategic shift in governance frameworks promoting AI autonomy. Policymakers should transition from incentivizing purely technical milestones to fostering an "AI-ready" institutional ecosystem. Specifically, the results support the necessity of developing standardized ethical frameworks to mitigate latent concerns regarding data privacy and algorithmic transparency—elements that are fundamentally essential for cultivating long-term systemic trust in AI integration (Jobin et al., 2019). Moreover, given the significant impact of facilitating conditions, national policies should encourage subsidized digital literacy programs for white-collar sectors. Reducing the perceived complexity and 'learning cost' of adopting sophisticated domestic LLMs like DeepSeek is critical for maintaining digital competitiveness. This strategic alignment addresses the current skill gaps in the modern workforce by facilitating seamless technology-human integration (Vrontis et al., 2023).

Despite its empirical contributions, this study is subject to several limitations that delineate avenues for future inquiry. Firstly, the geographic focus on white-collar professionals in Guangzhou may limit the generalizability of the findings to professionals in Tier-2 or Tier-3 cities where work-life dynamics and technological infrastructure might differ. Secondly, the cross-sectional nature of the data provides a snapshot of current perceptions; however, as AI tools become more embedded in daily professional routines, the relative importance of factors like Privacy Security and Perceived Usefulness may evolve. Future research should therefore employ longitudinal designs to track these shifting priorities over time. Additionally, incorporating qualitative methods, such as in-depth interviews, could uncover the underlying socio-cultural reasons for the observed "utility-usability trade-off." Expanding the scope to include industry-specific variables would also provide a more granular understanding of AI acceptance across different sectors of China's rapidly evolving digital economy.

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