

The Adoption of ChatGPT in SME Human Resource Practices: Integrating TOE-TAM with Trust as a Mediator and Religiosity as a Moderator

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KEYWORDS	ABSTRACT
Keywords: ChatGPT adoption; trust mediation; religiosity moderation; Indonesian SMEs; technology acceptance model; TOE framework Conflict of Interest Statement: The author(s) declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. Copyright © 2026 AMAR. All rights reserved.	Purpose: The development of artificial intelligence technology, particularly ChatGPT, presents both opportunities and challenges for Small and Medium-sized Enterprises (SMEs) in enhancing the efficiency of human resource management practices. However, the level of adoption of this technology is still influenced by various complex factors, not only technical but also psychological and individual values. This study aims to analyse the factors influencing the adoption of ChatGPT in SMEs through the integration of the Technology-Organisation-Environment (TOE) framework and the Technology Acceptance Model (TAM), whilst considering the mediating role of trust and the moderating role of religiosity. Research Design and Methodology: This study employs a quantitative approach using a survey method targeting SME operators in Central Java, East Java, and the Special Region of Yogyakarta (DIY). The sampling technique utilised purposive sampling, with a sample size of 200 SME operators meeting the study criteria. Data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with the assistance of SmartPLS software. Findings and Discussion: The results indicate that technological, organisational, and environmental factors, as well as perceptions of ease and utility, play a role in shaping trust in ChatGPT. This trust serves as the primary determinant in driving technology adoption, whilst religiosity was found to strengthen the relationship between trust and usage decisions. These findings confirm that ChatGPT adoption among SMEs is influenced not only by functional aspects but also by psychological factors and individual values. Implications: The implications of this research contribute to the development of a more context-specific technology adoption model based on artificial intelligence, whilst providing practical recommendations for SME stakeholders, technology developers, and policymakers in promoting the effective and sustainable utilisation of ChatGPT.

Introduction

The development of generative artificial intelligence, particularly ChatGPT, has transformed the way organisations manage information, make decisions, and carry out operational functions more quickly, adaptively, and cost-effectively. In the context of human resource management (HRM), AI-based technology is becoming increasingly relevant as it can assist with recruitment processes, job description drafting, training, performance evaluation, internal communication, and administrative decision-making more efficiently. For SMEs, the presence of ChatGPT is particularly significant as it brings digital capabilities previously accessible only to large corporations. However, various studies

also indicate that AI adoption in small businesses still faces major challenges, including resource constraints, organisational readiness, environmental uncertainty, trust issues, and ethical considerations. Consequently, research into the adoption of ChatGPT in HRM practices within SMEs is urgently needed, particularly as digital transformation is no longer merely a strategic choice but a necessity for maintaining business competitiveness amidst rapid changes in the business environment ([Benabou et al., 2025](#); [Pedrami & Vaezi, 2025](#); [Rajaram & Tinguely, 2024](#); [Schwaeke et al., 2025](#)).

The selection of SMEs in Indonesia as the research subject has a strong foundation, both theoretically and contextually. Firstly, Indonesian SMEs constitute a highly heterogeneous group in terms of digital literacy, technological readiness, human resource quality, and managerial capacity, thereby offering a rich context for testing technology adoption models. Secondly, compared to large companies which generally already have more established digital HR systems, SMEs face limitations in organisational structure, budget, and technical expertise; consequently, decisions to adopt technologies such as ChatGPT tend to be more sensitive to technological, organisational, environmental, and user perception factors. Thirdly, the Indonesian context differs from many previous studies because business decision-making in SMEs is often influenced by social, cultural, and religious dimensions. A number of studies in Indonesia have shown that technology adoption among SMEs is strongly influenced by perceived benefits, ease of use, external support, and trust, whilst in a more religiously nuanced context, the variable of religiosity has also proven relevant in shaping technology adoption behaviour. It is this uniqueness that makes Indonesian SMEs not only suitable but also important to select as the subject of research ([Nugraha et al., 2022](#); [Trinugroho et al., 2022](#); [Usman et al., 2022](#); [Widyanto et al., 2022](#)).

Conceptually, this study is built upon the integration of the Technology-Organisation-Environment (TOE) framework and the Technology Acceptance Model (TAM) to explain decisions regarding the adoption of ChatGPT in SME HRM practices. The TOE framework is used to explain how technological, organisational, and environmental factors shape readiness and external pressures for innovation adoption, whilst the TAM explains how perceived ease of use and perceived usefulness influence users' acceptance of technology. In the context of AI and ChatGPT, the relationships between these constructs become increasingly important because perceptions of benefits and the ' ' of ease of use do not always directly drive adoption; rather, they often operate through trust as a psychological mechanism that bridges assessments of the technology with actual usage decisions. The literature also indicates that trust is a central element in the acceptance of digital systems, particularly when the technology is new, complex, and high-risk. On the other hand, in a religious society such as Indonesia, religiosity can strengthen or weaken the influence of trust on adoption decisions, as the acceptance of technology is based not only on instrumental rationality but also on alignment with users' moral values and beliefs. Thus, the relationships between variables in this study are systemic: TOE and TAM factors influence trust, trust influences ChatGPT adoption, and religiosity moderates the strength of trust's influence on adoption ([Awa et al., 2015](#); [Davis, 1989](#); [Gefen et al., 2003](#); [Shahzad et al., 2024](#); [Natakusumah et al., 2023](#)).

Although research on technology adoption, AI, and ChatGPT is developing rapidly, there remains a significant research gap. Both classical and contemporary studies have extensively discussed TOE and TAM in the contexts of e-commerce, fintech, mobile payments, and the general adoption of digital technology among SMEs, but few have specifically examined ChatGPT adoption for HRM practices. Research on ChatGPT itself remains heavily dominated by educational contexts and student behaviour, for example in the studies by [Shahzad et al. \(2024\)](#), [Habibi et al. \(2024\)](#), and other ChatGPT adoption studies focusing on learning contexts, rather than business practitioners. On the other hand, studies on AI in HRM tend to remain in the form of systematic reviews, bibliometric analyses, or meta-syntheses that map general issues regarding AI adoption in the HR field; few offer integrated empirical testing within SMEs. Recent studies such as [Schwaeke et al. \(2025\)](#), [Sánchez et al. \(2025\)](#), [Pedrami and Vaezi \(2025\)](#), and [Benabou et al. \(2025\)](#) actually emphasise that AI research on SMEs and HRM still requires more context-specific empirical testing, particularly regarding organisational factors, trust, implementation readiness, and user values. In other words, there is a gap at the intersection of ChatGPT, HRM, Indonesian SMEs, trust as a mediator, and religiosity as a moderator that has not yet

been extensively addressed within a single integrated model ([Benabou et al., 2025](#); [Habibi et al., 2024](#); [Pedrami & Vaezi, 2025](#); [Sánchez et al., 2025](#); [Schwaeke et al., 2025](#); [Shahzad et al., 2024](#)).

Given this gap, the novelty of this study lies in the attempt to integrate the TOE-TAM framework to explain the adoption of ChatGPT in HRM practices within SMEs in Indonesia, by positioning trust in ChatGPT as a mediating variable and religiosity as a moderating variable. This model offers a theoretical contribution by expanding the technology adoption literature from its previously dominant rational-technological focus to a more contextual approach by incorporating psychological and value dimensions. Practically, this research is beneficial for SME practitioners, technology developers, business mentors, and policymakers in designing AI implementation strategies that are not only easy and useful but also trusted and aligned with user characteristics. Therefore, the objectives of this study are to analyse the influence of technological, organisational, and environmental factors, as well as perceived ease of use and perceived usefulness, on trust in ChatGPT; to test the influence of trust on ChatGPT adoption; to assess the role of trust as a mediator; and to test religiosity as a moderator in the relationship between trust and ChatGPT adoption within SME HRM practices in Indonesia ([Davis, 1989](#); [Gefen et al., 2003](#); [Natakusumah et al., 2023](#); [Usman et al., 2022](#); [Widyanto et al., 2022](#)).

Literature Review

Adoption of ChatGPT

Technology adoption refers to the process of accepting and using an innovation by individuals or organisations in their operational activities. In the context of this study, ChatGPT adoption is defined as the level of acceptance and use of artificial intelligence-based technology in human resource management practices within SMEs. Technology adoption is determined not only by the availability of the system but also by user readiness, perceptions of benefits, and environmental factors that support the implementation of the technology.

According to [Rogers \(2003\)](#), innovation adoption is influenced by innovation characteristics such as relative advantage, compatibility, complexity, trialability, and observability. In recent developments, the adoption of AI-based technologies such as ChatGPT exhibits more complex dynamics as it involves aspects of trust, algorithmic transparency, and risk perception. Research by [Dwivedi et al. \(2021\)](#) confirms that the adoption of AI within organisations is influenced by a combination of technical, organisational, and social factors that interact dynamically.

In the context of SMEs, the adoption of ChatGPT plays a strategic role as it can enhance operational efficiency and the quality of decision-making, particularly in HRM functions which are often still carried out manually. Therefore, understanding the determinants of technology adoption is crucial in driving digital transformation within the SME sector.

Technological Factors

Technological factors constitute one of the primary dimensions within the Technology-Organisation-Environment (TOE) framework, which explains how technological characteristics influence adoption decisions. These factors encompass aspects such as system complexity, technological compatibility, and the organisation's infrastructure readiness.

[Tornatzky and Fleischer \(1990\)](#) state that technology that is easy to integrate with existing systems and has a low level of complexity tends to be more readily adopted. A recent study by Oliveira and Martins (2011) indicates that technology quality and infrastructure readiness are key factors in driving the adoption of digital technology within organisations, particularly in the small business sector.

In the context of ChatGPT, technological factors relate not only to the system's technical capabilities but also encompass aspects of reliability, data security, and the system's ability to provide relevant and accurate outputs. The higher the perceived quality of the technology, the greater the likelihood that an organisation will develop trust in it.

Organisational Factors

Organisational factors reflect the internal conditions of an organisation that influence its readiness to adopt new technologies. These variables include support from top management, human resource readiness, organisational structure, and an organisational culture that is adaptable to change.

According to [Baker \(2012\)](#), organisations with a strong commitment to innovation and supported by visionary leadership tend to adopt new technologies more quickly. [Research by Zhu and Kraemer \(2005\)](#) also indicates that organisational readiness, including financial capacity and human resource competencies, has a significant influence on the adoption of digital technologies.

In the context of SMEs, organisational factors present a major challenge as resource constraints often hinder technology implementation. However, organisations capable of creating a work environment that supports innovation will find it easier to integrate technologies such as ChatGPT into their operational activities.

Environmental Factors

Environmental factors reflect external influences that affect an organisation's decision to adopt technology. These factors include competitive pressures, government regulations, and support from the business ecosystem.

According to [Zhu et al. \(2006\)](#), pressure from the external environment, such as industry competition and market demands, can be a key driver of technology adoption. Furthermore, government regulations and policies also play a role in creating an environment conducive to the implementation of digital technology.

In the context of SMEs in Indonesia, environmental factors play a significant role as business owners are often influenced by market trends, competitive pressures, and support from government programmes for SME digitalisation. Consequently, the external environment can act as both a driver and a barrier to ChatGPT adoption.

Perceived Ease of Use

Perceived ease of use is defined as the degree of confidence a person has that using a system does not require significant effort. This concept is one of the main constructs in the Technology Acceptance Model (TAM).

According to [Venkatesh and Bala \(2008\)](#), ease of use has a significant influence on technology acceptance as it can reduce cognitive barriers to using the system. A user-friendly system enhances user comfort and accelerates the adaptation process to new technology.

In the context of ChatGPT, ease of use is a crucial factor because users do not need to possess high technical expertise to utilise this technology. The conversation-based interface allows users to interact intuitively, thereby increasing the likelihood of adoption among SMEs with limited digital literacy.

Perceived Usefulness

Perceived usefulness refers to the extent to which a person believes that using a technology will improve their performance. This variable is a key determinant in explaining technology acceptance behaviour.

According to [Venkatesh et al. \(2003\)](#), perceived usefulness has a direct influence on the intention to use technology, as individuals tend to adopt technologies that add value to their activities. Research by [Tarhini et al. \(2017\)](#) also indicates that perceived usefulness plays a significant role in enhancing the effectiveness of digital technology use.

In the use of ChatGPT in HRM, the perceived benefits may include increased work efficiency, reduced administrative burden, and improved decision-making quality. Therefore, the higher the perceived benefits, the greater the likelihood that the technology will be adopted by SMEs.

Trust in ChatGPT

Trust is a crucial psychological factor in technology adoption, particularly for AI-based systems. Trust is defined as the belief that the technology can operate reliably, safely, and in line with user expectations.

According to [McKnight et al. \(2011\)](#), trust in technology comprises several dimensions: competence, integrity, and benevolence. In the context of AI, trust is also influenced by system transparency, clarity of output, and prior user experience.

Research by [Siau and Wang \(2018\)](#) indicates that trust is a key determinant in the acceptance of AI-based technology, as users often face uncertainty regarding how the system works. In the context of ChatGPT, trust serves as a crucial factor bridging the gap between users' perceptions of the technology and their decision to actually use it.

Religiosity

Religiosity refers to the level of religious belief, values, and practices held by an individual. In the context of consumer and organisational behaviour, religiosity can influence how individuals make decisions, including regarding the use of technology.

According to [Worthington et al. \(2003\)](#), religiosity is not only related to religious practices but also reflects moral and ethical values that influence individual behaviour. Research by Vitell et al. (2005) indicates that religiosity has a significant influence on ethical decision-making in a business context.

In the context of ChatGPT adoption, religiosity may act as a moderating factor influencing the relationship between trust and adoption decisions. Individuals with high levels of religiosity tend to consider moral and ethical aspects when using technology; thus, religiosity may strengthen or weaken the influence of trust on technology adoption.

Hypothesis Development

The Relationship between Environmental Factors and Trust in ChatGPT

Within the Technology-Organisation-Environment (TOE) framework, environmental factors reflect external pressures, ecosystem support, competitive dynamics, regulation, and market uncertainty that influence organisational decisions regarding technology. In the context of AI adoption in SMEs, the external environment not only determines the urgency of technology use but also shapes perceptions of whether the technology is trustworthy, safe, and aligned with business demands. Studies on technology adoption in SMEs indicate that environmental factors are key determinants in shaping organisational responses to digital innovation, whilst research on AI in SMEs confirms that environmental pressures and readiness also influence how technology is evaluated and responded to by business operators ([Faiz et al., 2024](#); [Sánchez et al., 2025](#); [Schwaeke et al., 2025](#)). In the context of ChatGPT, a supportive environment—such as the normalisation of AI use, competitive pressure to be more efficient, and exposure to digital business practices—tends to strengthen SME entrepreneurs' belief that ChatGPT is a technology worth using. Conversely, an unsupportive environment may give rise to doubts. Therefore, environmental factors are theoretically related to trust in ChatGPT.

H1: Environmental factors influence trust in ChatGPT.

The Relationship Between Organisational Factors and Trust in ChatGPT

Organisational factors within the TOE emphasise an organisation's internal readiness, including managerial support, human resource quality, a culture of innovation, and the organisation's ability to manage change. The literature on technology adoption among SMEs indicates that organisations with strong managerial support, structural readiness, and a sound digital culture are more open to new technologies ([Faiz et al., 2024](#)). In the context of AI, recent studies also indicate that organisational capabilities are a key driver of successful implementation, as AI is not merely a tool but a system requiring continuous adoption, learning, and control ([Sánchez et al., 2025](#); [Schwaeke et al., 2025](#)). When SMEs feel that their organisation is ready, has leadership support, and possesses the capacity to manage the use of ChatGPT, their level of trust in the technology tends to increase. Thus, organisational factors are seen to influence trust in ChatGPT.

H2: Organisational factors have a positive influence on trust in ChatGPT.

The Relationship Between Technological Factors and Trust in ChatGPT

Technological factors relate to the characteristics of the technology itself, such as compatibility, system maturity, reliability, output quality, and ease of integration. In the TOE, technological characteristics form the primary basis for an organisation's initial assessment of an innovation. In the context of AI, recent meta-analytical research indicates that elements of the TOE, particularly the technological dimension, significantly influence an organisation's adoption of AI, as the decision to adopt technology is highly dependent on perceptions of its readiness and technical quality ([Sánchez et al., 2025](#); TOE meta-analysis 2025). For ChatGPT, the quality of responses, stability of use, and system capabilities help users assess whether the technology is competent and reliable. When its technological characteristics are rated highly, trust in ChatGPT is more easily established. Therefore, technological factors are hypothesised to have a positive influence on trust in ChatGPT.

H3: Technological factors have a positive influence on trust in ChatGPT.

The Relationship Between Perceived Ease of Use and Trust in ChatGPT

In the Technology Acceptance Model (TAM), perceived ease of use is the belief that a technology can be used without significant effort. [Davis \(1989\)](#) identifies perceived ease of use as the primary determinant of technology acceptance, as technology that is easy to understand reduces users' psychological barriers. In subsequent literature, ease of use has also been shown to be linked to the formation of trust, as systems that are simple, clear, and unambiguous tend to be perceived as safer and more reliable ([Gefen et al., 2003](#)). In the context of ChatGPT, recent empirical studies indicate that perceived ease of use remains a key factor in the adoption process, and in several ChatGPT-related studies, trust plays a significant role in explaining how user perceptions translate into actual adoption ([Shahzad et al., 2024](#); MDPI study 2025). Consequently, when SME operators feel that ChatGPT is easy to learn and operate, their trust in the technology tends to increase.

H4: Perceived ease of use has a positive effect on trust in ChatGPT.

The Relationship Between Perceived Usefulness and Trust in ChatGPT

Perceived usefulness refers to the belief that the use of technology will improve user performance. In TAM, this construct is a central determinant of technology acceptance because individuals tend to accept technology that is perceived to provide tangible benefits for their tasks ([Davis, 1989](#)). In the extension of TAM to include trust, research indicates that perceived benefits can strengthen users' confidence in technology, as when technology tangibly aids work, users tend to perceive it as competent and trustworthy ([Gefen et al., 2003](#)). In the context of ChatGPT, benefits such as work efficiency, time savings, ease of document creation, and decision-making support can reinforce trust. Studies on ChatGPT adoption also indicate that perceived benefits are a key predictor in shaping adoption, and can work in tandem with trust to explain usage behaviour ([Shahzad et al., 2024](#); ChatGPT study 2025). Therefore, perceived usefulness is hypothesised to have a positive influence on trust in ChatGPT.

H5: Perceived usefulness has a positive influence on trust in ChatGPT.

The Relationship Between Trust in ChatGPT and the Adoption of ChatGPT

Trust is the belief that a technology possesses sufficient competence, reliability, and integrity for use. In the context of AI-based technology, trust becomes increasingly crucial as users are faced with systems that are complex, autonomous, and not always transparent. The classical TAM literature, integrated with trust, indicates that trust plays a significant role in enhancing the intention and behaviour of technology use ([Gefen et al., 2003](#)). More specifically, empirical studies on ChatGPT have found that trust has a positive influence on intent to use and actual use; thus, the higher the users' trust in ChatGPT, the greater their tendency to actually use the technology ([Choudhury & Shamszare, 2023](#)). Other studies on ChatGPT adoption also indicate that trust is a central factor in the process of adopting generative AI technology ([Shahzad et al., 2024](#); the 2024 study on teachers and ChatGPT). In

the context of SMEs, trust is crucial because adoption decisions are based not only on utility but also on the belief that the system can be relied upon to support HRM practices.

H6: Trust in ChatGPT has a positive influence on the adoption of ChatGPT.

The Relationship Between Religiosity and the Adoption of ChatGPT

Religiosity describes the extent to which religious values, beliefs, and orientations influence how individuals think and act. In the context of technology behaviour, religiosity is not merely a personal attribute, but a value system that can influence evaluations of the usefulness, appropriateness, and acceptance of innovations. Research in Indonesia indicates that religiosity can be integrated into technology adoption models and plays a role in explaining digital system usage behaviour, particularly in contexts rich in values and ethical considerations ([Usman et al., 2022](#)). Contemporary studies also confirm that value-based factors can influence the acceptance of AI beyond purely rational explanations, particularly when users assess technology through the lens of morality, identity, and social responsibility (studies on religiosity and AI 2025). In this study, religiosity is positioned as a factor that can drive the adoption of ChatGPT when the technology is perceived as aligning with moral values, ethics, and the common good. Therefore, religiosity is hypothesised to have a positive influence on the adoption of ChatGPT.

H7: Religiosity has a positive influence on the adoption of ChatGPT.

The Moderating Role of Religiosity in the Relationship Between Trust in ChatGPT and the Adoption of ChatGPT

The relationship between trust and technology adoption is not always uniform; in certain contexts, its strength may depend on the user's value system. Religiosity, as a value orientation, is believed to influence how individuals translate trust into adoption behaviour. Usman et al. (2022) demonstrate that religiosity can be integrated with trust within a technology acceptance model in Indonesia, indicating that trust in technology can be strengthened or weakened by users' religious values. Recent literature on AI also suggests that value and identity factors can influence technology acceptance both independently and interactively with other acceptance constructs (studies on religiosity and AI 2025). In the context of Indonesian SMEs, many of which are run by entrepreneurs with a strong value orientation, religiosity has the potential to strengthen the relationship between trust and the adoption of ChatGPT. This means that when SME entrepreneurs trust ChatGPT and simultaneously perceive its use as aligned with their religious values, the tendency to adopt ChatGPT will be higher.

H8: Religiosity moderates the influence of trust in ChatGPT on the adoption of ChatGPT.

The Mediating Role of Trust in ChatGPT in the Relationship Between Environmental Factors and the Adoption of ChatGPT

In technology adoption models, environmental factors often do not influence usage directly, but rather first shape users' psychological perceptions of the technology. The TOE literature explains that the external environment shapes an organisation's interpretative conditions regarding innovation, whilst research on trust in the context of ChatGPT indicates that trust can serve as a key pathway to actual usage ([Choudhury & Shamszare, 2023](#)). Thus, an environment that promotes the legitimacy of AI use and reduces uncertainty can increase trust, which in turn drives adoption. Therefore, trust in ChatGPT is hypothesised to mediate the relationship between environmental factors and the adoption of ChatGPT.

H9: Trust in ChatGPT mediates the influence of environmental factors on the adoption of ChatGPT.

The Mediating Role of Trust in ChatGPT in the Relationship Between Organisational Factors and the Adoption of ChatGPT

Organisational readiness, managerial support, and the quality of internal resources essentially foster the belief that technology can be managed and utilised effectively. From an organisational behaviour perspective, favourable internal conditions strengthen user trust before ultimately influencing adoption decisions. Studies on SMEs show that organisational capabilities play a crucial

role in technology acceptance, whilst ChatGPT studies indicate that trust is a central mechanism linking user evaluation with actual usage ([Faiz et al., 2024](#); [Choudhury & Shamszare, 2023](#)). Thus, the influence of organisational factors on adoption is hypothesised to operate through trust in ChatGPT. H10: Trust in ChatGPT mediates the influence of organisational factors on the adoption of ChatGPT.

The Mediating Role of Trust in ChatGPT in the Relationship Between Technological Factors and the Adoption of ChatGPT

Good technological characteristics will first foster user confidence in the technology before driving actual usage. In the context of AI, reliability, output quality, and system compatibility are factors that influence whether the technology is perceived as trustworthy. Once trust is established, the likelihood of adoption increases. This pattern aligns with the integration of TOE and trust, and is reinforced by studies on ChatGPT that position trust as a key determinant of technology use ([Choudhury & Shamszare, 2023](#); [Sánchez et al., 2025](#)). Therefore, trust in ChatGPT is hypothesised to mediate the influence of technological factors on the adoption of ChatGPT.

H11: Trust in ChatGPT mediates the influence of technological factors on the adoption of ChatGPT.

The Mediating Role of Trust in ChatGPT in the Relationship between Perceived Ease of Use and the Adoption of ChatGPT

In TAM, perceived ease of use generally increases technology acceptance because an easy-to-use system reduces cognitive load and user resistance. However, in the context of AI technologies such as ChatGPT, ease of use does not always directly lead to adoption; often, ease of use first enhances trust because users perceive the system as more understandable, controllable, and predictable. The integration of trust into TAM suggests that user-friendly systems can strengthen users' confidence in the technology, and this trust subsequently drives usage ([Gefen et al., 2003](#)). Empirical studies on ChatGPT also indicate that generative AI adoption models become stronger when trust is included as a mediating or moderating variable ([MDPI study 2025](#); [Shahzad et al., 2024](#)). Therefore, trust in ChatGPT is hypothesised to mediate the influence of perceived ease of use on the adoption of ChatGPT.

H12: Trust in ChatGPT mediates the effect of perceived ease of use on the adoption of ChatGPT.

The Mediating Role of Trust in ChatGPT in the Relationship Between Perceived Usefulness and the Adoption of ChatGPT

Perceived usefulness describes the belief that technology can enhance effectiveness and performance. In many technology acceptance studies, perceived benefits are the primary driver of usage intention. However, with AI technologies, perceived benefits often only translate into adoption behaviour if users also trust the technology. If users perceive ChatGPT as beneficial but do not yet trust its accuracy, security, or consistency, the decision to adopt it may be delayed. The TAM-trust literature confirms that perceived benefits and trust often work simultaneously in shaping technology acceptance ([Gefen et al., 2003](#)). Recent ChatGPT studies also position trust as a key variable in bridging the gap between perception determinants and adoption or usage intention ([Choudhury & Shamszare, 2023](#); [MDPI 2025 study](#)). Consequently, trust in ChatGPT is hypothesised to mediate the influence of perceived usefulness on the adoption of ChatGPT.

H13: Trust in ChatGPT mediates the influence of perceived usefulness on the adoption of ChatGPT.

Research Design and Methodology

This study employs a quantitative approach with an explanatory research design aimed at testing causal relationships between variables within the research model. This approach was chosen because the study focuses on testing hypotheses developed from the integration of the Technology-Organisation-Environment (TOE) framework and the Technology Acceptance Model (TAM), and involves mediating and moderating variables within a single complex structural model.

Data analysis was conducted using Partial Least Squares-based Structural Equation Modelling (PLS-SEM) with the aid of SmartPLS software. This method was chosen due to its robust capability in analysing complex relationships between latent constructs, including the simultaneous testing of

direct, indirect (mediation) and interaction (moderation) effects. Furthermore, PLS-SEM does not require a normal data distribution and is more flexible in handling relatively moderate sample sizes, making it suitable for research in the context of new technologies such as ChatGPT ([Hair et al., 2022](#); [Sarstedt et al., 2020](#)).

Location, Time, and Research Subjects

This study was conducted among Small and Medium Enterprises (SMEs) operating in three provinces in Indonesia, namely Central Java, East Java, and the Special Region of Yogyakarta (DIY). The selection of these regions was based on the high concentration of SMEs and the diversity in levels of digital technology adoption across each area. These conditions provide a representative and relevant context for examining the acceptance of artificial intelligence-based technologies, particularly ChatGPT, in human resource management practices.

The research focuses on SME operators who are already familiar with or use digital technology in their business activities. This aims to ensure that respondents possess a basic understanding of technology use, thereby enabling them to provide a more accurate assessment of the factors influencing the adoption of ChatGPT.

Data collection was conducted between June and July 2025 via an online questionnaire survey distributed using the Google Forms platform. This approach was chosen to reach a wider range of respondents across various regions, as well as to enhance efficiency and speed in the data collection process. Furthermore, the use of an online questionnaire also enables researchers to obtain data in real-time with a high degree of flexibility.

Population and Sampling Technique

The population for this study comprises all Small and Medium Enterprises (SMEs) operating in three provinces—Central Java, East Java, and the Special Region of Yogyakarta (DIY)—that possess the potential or experience in utilising digital technology within their business operations. The selection of this population is based on the high level of SME economic activity in these regions and the diversity in the adoption of digital technology, thereby providing a relevant context for examining the acceptance of artificial intelligence-based technologies such as ChatGPT.

The sampling technique used in this study was purposive sampling, namely the selection of respondents based on specific criteria aligned with the research objectives. The respondent criteria include: (1) SME owners or managers, (2) possessing a basic understanding of digital technology, and (3) having used or at least being aware of ChatGPT or similar artificial intelligence-based technologies. The selection of these criteria aims to ensure that respondents possess relevant experience and sufficient understanding to provide valid assessments of the variables under investigation.

The determination of the sample size is based on the approach used in Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis, namely a minimum of ten times the number of the largest indicators within a single construct or ten times the number of the largest structural paths in the model ([Hair et al., 2022](#)). Furthermore, to enhance the statistical power and reliability of the results, this study also considered the recommended minimum sample size of between 100 and 200 respondents, as suggested in the methodological literature ([Kock & Hadaya, 2018](#)).

Based on these considerations, the sample size used in this study was 200 respondents, which was deemed sufficient to support the structural model analysis and produce stable and reliable estimates in hypothesis testing.

Data Sources and Types

This study utilised primary data obtained directly from respondents via the distribution of a questionnaire. The data collected comprised quantitative data reflecting respondents' perceptions, attitudes, and experiences regarding the use of ChatGPT in human resource management practices within SMEs.

Variables were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). This scale was chosen as it is capable of capturing respondents' perceptions more flexibly and is commonly used in technology behaviour research ([Joshi et al., 2015](#)).

Research Instrument

The research instrument used in this study was a structured questionnaire designed based on validated indicators from previous research, subsequently adapted to the context of ChatGPT usage in SMEs.

The questionnaire consists of two main sections: the first section containing respondent profile information, and the second section containing questions to measure each research variable. All variables were measured using reflective indicators that comprehensively describe the latent constructs.

The technological factors variable is measured using six indicators representing system quality, technological reliability, and integration capabilities within business operations. The organisational factors variable is also measured using six indicators reflecting the organisation's internal readiness, including management support and resource readiness.

Furthermore, the environmental factors variable is measured using five indicators that describe the influence of the external environment, such as competitive pressure and regulation. The perceived usefulness and perceived ease of use variables are each measured using five indicators that reflect the benefits and ease of use of ChatGPT in work activities.

The 'trust in ChatGPT' variable is measured using seven indicators representing trust in the technology's reliability, security, and consistency. The 'religiosity' variable is measured using six indicators reflecting respondents' values, beliefs, and religious orientation regarding technology use. Meanwhile, the 'adoption of ChatGPT' variable is measured using six indicators describing the level of acceptance and use of the technology in business operations.

Furthermore, this study also includes a moderation variable in the form of the interaction between religiosity and trust in ChatGPT, which is incorporated into the structural model to test the moderating effect.

Operational Definitions of Variables

The following are the operational definitions of the variables in this study:

Table 1. Operational Variables of the Study

Variable	Code	Operational Definition	Indicator	Item	Scale
Technological Factors	X1	MSME operators' perceptions of the quality and readiness of ChatGPT technology in supporting operational activities, particularly in terms of reliability, compatibility, and ease of access.	System quality	X1.1	Likert 1-5
			Accuracy of information	X1.2	
			Technology compatibility	X1.3	
			System reliability	X1.4	
			Accessibility	X1.5	
			Performance support	X1.6	
Organisational Factors	X2	The level of internal readiness of SMEs to adopt ChatGPT, encompassing management support, resource readiness, and organisational structure.	Management support	X2.1	Likert 1-5
			Resource availability	X2.2	
			Human resource competence	X2.3	

			Organisational structure	X2.4	
			Culture of innovation	X2.5	
			Organisational readiness	X2.6	
Environmental Factors	X3	The influence of the external environment on SME decisions regarding the use of ChatGPT, including competitive pressures, regulations, and business dynamics.	Environmental support	X3.1	Likert 1-5
			Competitive pressure	X3.2	
			Efficiency demands	X3.3	
			Regulatory support	X3.4	
			External influences	X3.5	
Perceived Usefulness	X4	The level of confidence that using ChatGPT provides tangible benefits in improving work performance and efficiency.	Work efficiency	X4.1	Likert 1-5
			Productivity	X4.2	
			Work speed	X4.3	
			Quality of work	X4.4	
			Decision support	X4.5	
Perceived Ease of Use	X5	The level of confidence that ChatGPT is easy to learn, use and operate without significant effort.	Ease of learning	X5.1	Likert 1-5
			Ease of use	X5.2	
			Ease of interaction	X5.3	
			Minimal effort	X5.4	
			Ease of operation	X5.5	
Trust in ChatGPT	Z	The level of trust SME operators have in ChatGPT regarding reliability, security, and the consistency of the results provided.	Reliability	Z.1	Likert 1-5
			Security	Z.2	
			Consistency	Z.3	
			Usability	Z.4	
			System Competence	Z.5	
			Low risk	Z.6	
			Confidence of use	Z.7	
Religiosity	M	The level of religious values and beliefs that influence an individual's behaviour in the use of technology, particularly in moral and ethical aspects.	Religious values	M.1	Likert 1-5
			The influence of beliefs	M.2	
			Moral values	M.3	
			Ethical considerations	M.4	

			Religious values	M.5	
			The influence of religiosity	M.6	
Adoption of ChatGPT	Y	Levels of acceptance and use of ChatGPT in human resource management practices within SMEs.	Actual usage	Y.1	Likert 1-5
			Intention to use	Y.2	
			Dependence on use	Y.3	
			Intensity of use	Y.4	
			Recommendations	Y.5	
			Implementation	Y.6	

Data Analysis Techniques

Data analysis in this study was conducted using the Partial Least Squares Structural Equation Modelling (PLS-SEM) approach with the aid of SmartPLS software. The analysis procedure was carried out in stages, beginning with the evaluation of the measurement model and proceeding to the structural model.

The measurement model (outer model) was evaluated to test the validity and reliability of the constructs, which included testing convergent validity via outer loading values (> 0.70), discriminant validity, as well as composite reliability (> 0.70) and Average Variance Extracted (AVE > 0.50).

Subsequently, the structural model (inner model) was evaluated to test the relationships between latent variables using path coefficients, R-squared values, and the significance of the relationships, which were tested using the bootstrapping technique. Additionally, effect size (f^2) tests were conducted to measure the magnitude of the influence of each independent variable on the dependent variable.

Mediation testing was carried out by analysing the indirect effect, whilst moderation testing was conducted by including interaction variables in the structural model. This approach enables the simultaneous analysis of complex relationships between variables and provides robust results in research on technology adoption behaviour (Hair et al., 2022).

Model Fit Tests

To ensure the quality and suitability of the research model, several additional tests were carried out, including a multicollinearity test using the Variance Inflation Factor (VIF) with a maximum threshold of 5, as well as a predictive relevance test (Q^2) to assess the model's predictive ability.

These tests aim to ensure that the model used is not only valid and reliable but also possesses good predictive power in explaining the phenomenon of ChatGPT adoption among SMEs.

Findings and Discussion

Findings

Respondent Characteristics

Respondent characteristics are a crucial aspect of quantitative research as they provide an overview of the profiles of the individuals serving as the research data source. This information not only serves to ensure that respondents meet the research criteria but also aids in understanding the demographic and geographical contexts that may influence respondents' perceptions and behaviour regarding technology adoption, particularly ChatGPT in human resource management practices.

In this study, the respondents were Small and Medium Enterprises (SMEs) operating in three provinces in Indonesia, namely Central Java, East Java, and the Special Region of Yogyakarta (DIY), who met the research criteria, namely having an understanding of digital technology and being aware of or having used ChatGPT or similar technologies. Respondent characteristics are presented based on five main aspects, namely business location, gender, age, educational level, and length of business operation, which are considered representative in describing the profile of SME operators in the context of digital technology adoption.

Table 2. Respondent Characteristics

Characteristics	Category	Number	Percentage (%)
Business Location	Central Java	75	37.5%
	East Java	80	40%
	DIY	45	22.5%
Gender	Male	110	55%
	Female	90	45%
Age	Under 25	30	15%
	25-35 years	85	42.5
	36-45 years	55	27.5
	> 45 years	30	15
Education	Secondary school	70	35%
	Diploma	40	20%
	Bachelor's degree	75	37.5%
	Postgraduate	15	7.5%
Length of business	< 2 years	50	25
	2-5 years	80	40%
	6-10 years	45	22.5
	> 10 years	25	12.5

Based on Table 2, the distribution of respondents by business location indicates that the majority of SME operators are from East Java (40%), followed by Central Java (37.5%) and the Special Region of Yogyakarta (22.5%). This distribution reflects a fairly proportional representation of the three study regions, which are known for their high levels of SME economic activity and variations in digital technology adoption. This geographical diversity provides a more comprehensive picture of ChatGPT adoption behaviour within a regional context.

In terms of gender, the majority of respondents were male (55%), whilst females accounted for 45%. This composition indicates that respondent participation is relatively balanced, although there remains a male dominance in SME management. This suggests that the role of women in entrepreneurship is also becoming increasingly significant, including in the utilisation of digital technology.

In terms of age, the majority of respondents were in the 25-35 age group (42.5%), followed by the 36-45 age group (27.5%). The dominance of this productive age group suggests that SME operators who are relatively more adaptable to technological developments form the main group in this study. This age group tends to have a higher level of digital literacy and openness to innovation, making them more likely to adopt ChatGPT.

In terms of educational attainment, the majority of respondents held a bachelor's degree (37.5%) or had completed upper secondary school (35%). This indicates that respondents possess sufficient cognitive capacity to understand and evaluate the benefits of digital technology. Higher educational attainment also contributes to greater readiness to adopt artificial intelligence-based technology.

Meanwhile, based on the duration of business operation, the majority of respondents have been running their businesses for 2-5 years (40%), indicating that most SME operators are in the business growth phase. At this stage, business operators tend to be more open to innovation and actively seek solutions to improve efficiency and competitiveness through the use of technology.

Overall, the characteristics of the respondents indicate that the research sample is dominated by SME owners located in regions with high economic activity, of working age, with adequate educational levels, and in a developing business phase. These conditions reinforce the relevance of the research in examining the adoption of ChatGPT, as this group represents the segment most likely to embrace and implement digital technology in human resource management practices.

Data Analysis

Assessing the Outer Model or Measurement Model

In the application of data analysis techniques using SmartPLS, the assessment of the outer model is based on three main criteria, namely Convergent Validity, Discriminant Validity, and Composite Reliability. These three criteria are used to ensure that the indicators used are capable of accurately

reflecting the constructs, clearly distinguishing between constructs, and demonstrating internal consistency among indicators within a single latent variable.

Convergent Validity

Convergent validity in a measurement model with reflective indicators is evaluated based on the strength of the correlation between the item scores or component scores generated by the SmartPLS software and the construct being measured. A reflective indicator is considered to have good convergent validity if its correlation value exceeds 0.70. This indicates that the indicator is capable of adequately explaining the latent variable, as its contribution to the construct is sufficiently strong and consistent.

Table 3. Outer Loadings (Measurement Model)

	s ChatGP T Adopti on (Y)	Enviro nment al Factors (X3)	Organi sationa l Factors (X2)	Percei ved Ease of Use (X5)	Percei ved Useful ness (X4)	Religio sity (M)	Techno logical- al Factors (X1)	Trust in ChatGP T (Z)	Religio sity (M) × Trust in ChatGP T's (Z)
M.1						0.848			
M.2						0.933			
M.3						0.936			
M.4						0.907			
M.5						0.947			
M.6						0.946			
X1.1							0.916		
X1.2							0.935		
X1.3							0.933		
X1.4							0.944		
X1.5							0.929		
X1.6							0.944		
X2.1			0.929						
X2.2			0.953						
X2.3			0.948						
X2.4			0.947						
X2.5			0.959						
X2.6			0.950						
X3.1		0.929							
X3.2		0.949							
X3.3		0.948							
X3.4		0.954							
X3.5		0.943							
X4.1					0.899				
X4.2					0.959				
X4.3					0.956				
X4.4					0.944				
x4.5					0.956				
X5.1				0.942					
X5.2				0.941					
X5.3				0.942					
X5.4				0.938					
X5.5				0.935					
Y.1	0.894								
Y.2	0.903								
Y.3	0.912								
Y.4	0.907								
Y.5	0.895								
Y.6	0.895								
Z.1								0.936	
Z.2								0.939	
Z.3								0.934	
Z.4								0.933	

Z.5	0.931	
Z.6	0.886	
Z.7	0.954	
Religiosity (M)		1,000
× Trust in ChatGPT (Z)		

This study demonstrates that the adoption of ChatGPT in human resource management practices within SMEs is strongly influenced by technological, organisational and environmental factors, as well as perceptions of the ease and benefits of using the system, as reflected by the very high loading values of the indicators across all constructs. Trust in ChatGPT acts as a key mediating mechanism bridging the influence of these factors on adoption decisions, confirming that confidence in the technology's reliability and security is key to acceptance. Furthermore, religiosity functions as a moderating variable shaping the strength of the relationship between trust and adoption, thereby indicating that the values and beliefs of individual SME practitioners also influence the technology adoption process, rather than merely technical and functional considerations.

Discriminant Validity

A discriminant validity test was conducted to ensure that each construct of the latent variables is truly unique and does not overlap with other constructs. A model is said to have good discriminant validity if each indicator has the highest loading value on the construct it measures compared to the loadings on other constructs. The results of the discriminant validity test are shown as follows:

Table 4. Discriminant Validity Values (Fornell-Larcker)

	Adoption of ChatGPT (Y)	Environmental Factors (X3)	Organisational Factors (X2)	Perceived Ease of Use (X5)	Perceived Usefulness (X4)	Religiosity (M)	Technological Factors (X1)	Trust in ChatGPT (Z)
Adoption of ChatGPT (Y)	0.901							
Environmental Factors (X3)	0.955	0.945						
Organisational Factors (X2)	0.949	0.966	0.948					
Perceived Ease of Use (X5)	0.928	0.953	0.981	0.939				
Perceived Usefulness (X4)	0.929	0.961	0.981	0.986	0.943			
Religiosity (M)	0.953	0.977	0.978	0.971	0.980	0.920		
Technological Factors (X1)	0.969	0.994	0.976	0.962	0.969	0.984	0.934	
Trust in ChatGPT (Z)	0.945	0.962	0.986	0.995	0.989	0.979	0.972	0.931

Composite Reliability.

The validity and reliability of a construct can also be evaluated through the construct reliability value and the Average Variance Extracted (AVE) value for each construct. A construct is considered to have adequate reliability if its reliability value reaches at least 0.70 and its AVE value exceeds 0.50. This indicates that the construct is not only consistent in measuring what it is intended to measure

but is also capable of explaining the majority of the variance in its indicators, thereby serving as a valid representation of the concept in question.

Table 5. Composite Reliability Values

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average Variance Extracted (AVE)
Adoption of ChatGPT (Y)	0.954	0.955	0.963	0.812
Environmental Factors (X3)	0.970	0.970	0.976	0.892
Organisational Factors (X2)	0.977	0.977	0.981	0.898
Perceived Ease of Use (X5)	0.967	0.967	0.974	0.883
Perceived Usefulness (X4)	0.969	0.970	0.976	0.889
Religiosity (M)	0.963	0.964	0.971	0.847
Technological Factors (X1)	0.970	0.971	0.976	0.871
Trust in ChatGPT (Z)	0.974	0.974	0.978	0.866

Referring to Table 5, it can be concluded that all constructs have met the reliability criteria. This is evident from the composite reliability values exceeding 0.70 and the AVE values above 0.50, in line with the recommended thresholds for validity and reliability testing.

Structural Model Testing (Inner Model)

Testing of the inner model or structural model aims to assess the relationships between constructs, the level of significance, and the R-squared value of the model constructed. The structural model is evaluated by examining the R-squared value for the dependent construct, as well as testing the t-statistic and significance of the path coefficients linking the latent variables.

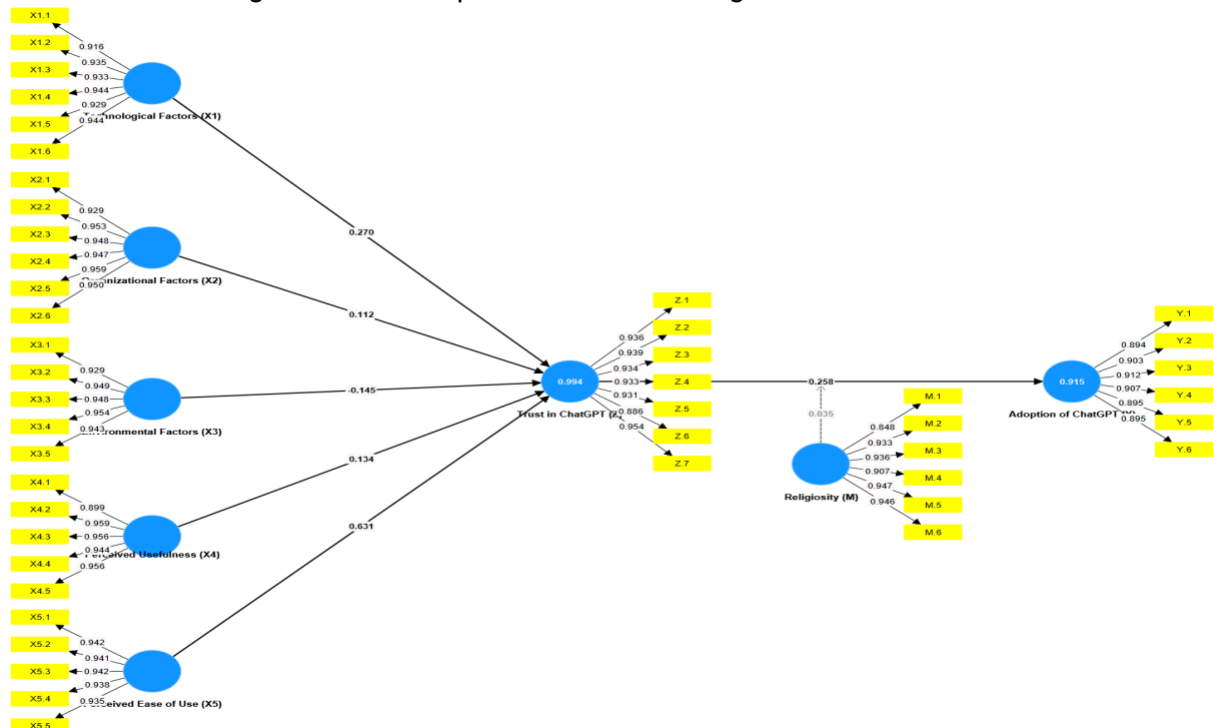


Figure 1. The tested structural model

When assessing a model using PLS, the process begins by examining the *R-squared* value for each dependent latent variable. Table 6 presents the estimated *R-squared* values using SmartPLS.

Table 6. R-Square Values

	R-squared	Adjusted R-squared
Adoption of ChatGPT (Y)	0.915	0.914
Trust in ChatGPT (Z)	0.994	0.994

Table 6 shows that the R-squared and adjusted R-squared values indicate a very strong explanatory power of the model. The Adoption of ChatGPT variable has an R-squared of 0.915 and an

adjusted R-squared of 0.914, meaning that 91.5% of the variation in ChatGPT adoption among SMEs can be explained by technological, organisational, and environmental factors, as well as perceptions of ease of use, perceived benefits, trust, and the moderating interaction of religiosity, whilst the remainder is explained by factors outside the model. Meanwhile, Trust in ChatGPT has an R-squared and adjusted R-squared of 0.994, indicating that 99.4% of the variation in trust in ChatGPT can be explained by the exogenous variables within the model, thereby confirming the strength of the TOE-TAM framework in explaining the formation of trust as the primary foundation for technology adoption among SMEs.

Hypothesis Test Results

Direct (Partial) Effect

Table 7. Results of the Direct (Partial) Effect Hypothesis Test

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T-statistic (O/STDEV)	P-values	Alpha	Conclusion
Environmental Factors (X3) -> Trust in ChatGPT (Z)	-0.145	-0.148	0.060	2.443	0.015	0.05	Significant Positive Significant
Organisational Factors (X2) -> Trust in ChatGPT (Z)	0.112	0.113	0.037	3.044	0.002	0.05	Significantly Positive Influence
Perceived Ease of Use (X5) -> Trust in ChatGPT (Z)	0.631	0.622	0.047	13.349	0.000	0.05	Significantly Positive Influence
Perceived Usefulness (X4) -> Trust in ChatGPT (Z)	0.134	0.143	0.056	2.382	0.017	0.05	Significantly Positive Influence
Religiosity (M) -> Adoption of ChatGPT (Y)	0.724	0.734	0.084	8.625	0.000	0.05	Significantly Positive
Technological Factors (X1) -> Trust in ChatGPT (Z)	0.270	0.272	0.074	3.627	0.000	0.05	Significantly Positive Effect
Trust in ChatGPT (Z) -> Adoption of ChatGPT (Y)	0.258	0.249	0.082	3.148	0.002	0.05	Significantly Positive Effect
Religiosity (M) x Trust in ChatGPT (Z) -> Adoption of ChatGPT (Y)	0.035	0.036	0.013	2.729	0.006	0.05	Significantly Positive Effect

Table 7 shows that the results of the partial tests for the variables under investigation all have t-statistics greater than the critical t-value of 1.968 and P-values less than 0.05, indicating a significant effect:

1. The Effect of Environmental Factors on Trust in ChatGPT
Environmental factors have a significant effect on trust in ChatGPT, with a t-statistic of 2.443—greater than the critical t-value of 1.968—and a P-value of 0.015, which is less than 0.05. These results indicate that external environmental conditions such as regulation, competitive pressure, and industry norms play a tangible role in shaping SME actors' trust in ChatGPT. Negative path coefficients suggest that an increasingly unfavourable environment tends to reduce trust levels, although the effect remains statistically significant.
2. The Influence of Organisational Factors on Trust in ChatGPT

Organisational factors were found to have a positive and significant influence on trust in ChatGPT, as demonstrated by a t-statistic of 3.044, which exceeds the critical t-value of 1.968, and a P-value of 0.002, which is less than 0.05. This indicates that management support, resource readiness, and a sound organisational structure are capable of enhancing SMEs' trust in the use of ChatGPT within HRM practices.

3. The Effect of Perceived Ease of Use on Trust in ChatGPT
Perceived ease of use has a positive and significant influence on trust in ChatGPT, with a t-statistic value of 13.349—far greater than 1.968—and a P-value of 0.000, which is less than 0.05. This finding confirms that ease of use is the most dominant factor in building trust, as technology that is easy to understand and operate reduces perceived risk and increases user confidence.
4. The Effect of Perceived Usefulness on Trust in ChatGPT
Perceived usefulness has a positive and significant effect on trust in ChatGPT, as evidenced by a t-statistic of 2.382, which is greater than 1.968, and a P-value of 0.017, which is less than 0.05. This indicates that the perception of tangible benefits from ChatGPT, such as improved efficiency and effectiveness in HR management, fosters growing trust among SME operators in the technology.
5. The Effect of Religiosity on the Adoption of ChatGPT
Religiosity has a positive and significant effect on the adoption of ChatGPT, with a t-statistic of 8.625, which exceeds the critical t-value of 1.968, and a P-value of 0.000, which is less than 0.05. This finding indicates that the religious values held by SME operators play a significant role in driving the acceptance of ChatGPT, particularly when the technology is perceived to align with the moral and ethical principles they believe in.
6. The Influence of Technological Factors on Trust in ChatGPT
Technological factors have a positive and significant influence on trust in ChatGPT, as indicated by a t-statistic of 3.627, which is greater than 1.968, and a P-value of 0.000, which is less than 0.05. This confirms that technological quality, system reliability, and infrastructure compatibility form a crucial foundation for building SMEs' trust in ChatGPT.
7. The Influence of Trust in ChatGPT on the Adoption of ChatGPT
Trust in ChatGPT has a positive and significant influence on the adoption of ChatGPT, with a t-statistic value of 3.148, which is greater than 1.968, and a P-value of 0.002, which is less than 0.05. These results indicate that the higher the level of trust in ChatGPT, the greater the tendency for SME practitioners to adopt it in human resource management practices.
8. The Moderating Influence of Religiosity and Trust in ChatGPT on the Adoption of ChatGPT
The interaction between religiosity and trust in ChatGPT has a positive and significant effect on the adoption of ChatGPT, as evidenced by a t-statistic of 2.729, which exceeds 1.968, and a p-value of 0.006, which is less than 0.05. This finding indicates that religiosity reinforces the influence of trust on the adoption of ChatGPT; thus, at higher levels of religiosity, trust has an increasingly strong impact on driving the decision to adopt the technology.

Mediating Effect

In this analysis, we will examine the magnitude of both direct and indirect influence coefficients. A mediation test is conducted to explore in greater depth whether the mediating variable successfully mediates the influence of the independent variable on the dependent variable. If the *P-value* is less than 0.05, the independent variable influences the dependent variable; this can be explained in the *indirect effect* output, indicating that the influence on the dependent variable occurs via the mediating variable. Results of the path analysis in the *indirect effect output*: if the *P-value* is less than 0.05, mediation occurs (Sofyani, 2013).

Table 8. Results of the Hypothesis Test on Mediation Effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T-statistic (O/STDEV)	P-values	Notes
Environmental Factors (X3) -> Trust in ChatGPT (Z) ->	-0.037	-0.036	0.018	2.053	0.040	Mediating

Adoption of ChatGPT (Y)						
Organisational Factors (X2) -> Trust in ChatGPT (Z) -> Adoption of ChatGPT (Y)	0.029	0.029	0.015	1.955	0.051	No mediation
Perceived Ease of Use (X5) -> Trust in ChatGPT (Z) -> Adoption of ChatGPT (Y)	0.163	0.156	0.054	2.995	0.003	Mediating
Perceived Usefulness (X4) -> Trust in ChatGPT (Z) -> Adoption of ChatGPT (Y)	0.035	0.034	0.016	2.213	0.027	Mediating
Technological Factors (X1) -> Trust in ChatGPT (Z) -> Adoption of ChatGPT (Y)	0.070	0.067	0.028	2.486	0.013	Mediating

Based on the results in the table, the following can be explained:

1. Mediation of Trust in ChatGPT on the Influence of Environmental Factors on the Adoption of ChatGPT
The test results indicate that Trust in ChatGPT mediates the influence of environmental factors on the adoption of ChatGPT, with a t-statistic value of 2.053, which is greater than the critical t-value of 1.968, and a P-value of 0.040, which is less than 0.05. Negative path coefficients indicate that external environmental conditions influence the adoption of ChatGPT indirectly through the formation of trust, whereby a less conducive environment can lower the level of trust and ultimately hinder adoption.
2. Mediation of Trust in ChatGPT on the Influence of Organisational Factors on the Adoption of ChatGPT
Trust in ChatGPT does not mediate the influence of organisational factors on the adoption of ChatGPT, as indicated by a t-statistic of 1.955, which is smaller than the critical t-value of 1.968, and a P-value of 0.051, which is greater than 0.05. These results indicate that although organisational factors have a direct influence on trust, their indirect influence via trust is not yet strong enough to significantly drive the adoption of ChatGPT.
3. Mediation of Trust in ChatGPT on the Effect of Perceived Ease of Use on the Adoption of ChatGPT
Trust in ChatGPT was found to mediate the effect of perceived ease of use on the adoption of ChatGPT, with a t-statistic of 2.995, which is greater than 1.968, and a P-value of 0.003, which is less than 0.05. This finding indicates that ease of use increases ChatGPT adoption through enhanced trust, thereby making trust a crucial mechanism bridging the perception of ease with the adoption decision.
4. Mediation of Trust in ChatGPT on the Effect of Perceived Usefulness on the Adoption of ChatGPT
Trust in ChatGPT mediates the effect of perceived usefulness on the adoption of ChatGPT, with a t-statistic of 2.213, which is greater than the critical t-value of 1.968, and a P-value of 0.027, which is less than 0.05. This confirms that the perceived benefits of ChatGPT drive adoption indirectly through the development of trust among SME operators in the technology.
5. Mediation of Trust in ChatGPT on the Effect of Technological Factors on the Adoption of ChatGPT
Trust in ChatGPT was found to mediate the influence of technological factors on the adoption of ChatGPT, with a t-statistic of 2.486—greater than 1.968—and a P-value of 0.013—smaller than 0.05. These results indicate that technological characteristics and readiness influence the decision to adopt ChatGPT by increasing trust, meaning that trust acts as the primary link between technological aspects and adoption behaviour among SMEs.

Effect Size (f-square)

Effect size (f^2) is used to assess the magnitude of the specific influence of an independent variable on the predictive power of the dependent variable. The evaluation is carried out by comparing changes in the R^2 value when an independent variable is removed from the model. The f^2 value is interpreted as follows:

- $f^2 < 0.02$ indicates a very small or insignificant effect
- $0.02 \leq f^2 < 0.15$ indicates a small effect
- $0.15 \leq f^2 < 0.35$ indicates a moderate effect
- $f^2 \geq 0.35$ indicates a large effect

Based on the analysis results, the effect sizes for each variable are as follows:

Table 9. Effect Size (f-square)

	f-square
Environmental Factors (X3) -> Trust in ChatGPT (Z)	0.041
Organisational Factors (X2) -> Trust in ChatGPT (Z)	0.046
Perceived Ease of Use (X5) -> Trust in ChatGPT (Z)	1.603
Perceived Usefulness (X4) -> Trust in ChatGPT (Z)	0.067
Religiosity (M) -> Adoption of ChatGPT (Y)	0.242
Technological Factors (X1) → Trust in ChatGPT (Z)	0.098
Trust in ChatGPT (Z) -> Adoption of ChatGPT (Y)	0.032
Religiosity (M) × Trust in ChatGPT (Z) → Adoption of ChatGPT (Y)	0.036

Based on the results in the table, the following can be explained:

1. The influence of environmental factors on trust in ChatGPT
Environmental factors on trust in ChatGPT have an f^2 value of 0.041, which falls within the range $0.02 \leq f^2 < 0.15$, and is therefore interpreted as having a small effect. This indicates that external environmental conditions such as regulations, competitive pressure, and industry norms do contribute to shaping SME actors' trust in ChatGPT; however, their influence is relatively limited and supportive in nature compared to other variables in the model.
2. The Influence of Organisational Factors on Trust in ChatGPT
Organisational factors on trust in ChatGPT have an f^2 value of 0.046, which falls within the small effect category ($0.02 \leq f^2 < 0.15$). This finding indicates that organisational readiness, management support, and the availability of internal resources play a role in enhancing trust in ChatGPT, but their contribution is not yet dominant in explaining variations in trust.
3. The Effect of Perceived Ease of Use on Trust in ChatGPT
Perceived ease of use in relation to trust in ChatGPT has an f^2 value of 1.603, which falls within the $f^2 \geq 0.35$ category and is therefore interpreted as having a large effect. This confirms that ease of use is the strongest and most dominant factor in building trust in ChatGPT among SME practitioners, as a system that is easy to understand and operate significantly reduces perceived risk and increases user confidence.
4. The Effect of Perceived Usefulness on Trust in ChatGPT
The perceived usefulness of ChatGPT has an f^2 value of 0.067, which falls within the small effect category ($0.02 \leq f^2 < 0.15$). This finding indicates that the perceived benefits of using ChatGPT's ' ' feature, such as improved efficiency and quality of HR management, still contribute to building trust; however, its role is more supplementary compared to the ease-of-use factor.
5. The Effect of Religiosity on the Adoption of ChatGPT
The effect of religiosity on the adoption of ChatGPT has an f^2 value of 0.242, which falls within the range $0.15 \leq f^2 < 0.35$, and is therefore interpreted as having a moderate effect. This indicates that the religious values and beliefs of SME owners play a fairly strong role in driving the decision to adopt ChatGPT, particularly when the technology is perceived to align with the moral principles, ethics, and religious values they hold.
6. The Influence of Technological Factors on Trust in ChatGPT
The influence of technological factors on trust in ChatGPT has an f^2 value of 0.098, which falls within the category of a small effect ($0.02 \leq f^2 < 0.15$). This finding indicates that technological

quality, system compatibility, and infrastructure reliability contribute to increasing trust in ChatGPT, but their influence is not as strong as the perception of ease of use.

7. The Influence of Trust in ChatGPT on the Adoption of ChatGPT

Trust in ChatGPT on the adoption of ChatGPT has an f^2 value of 0.032, which falls within the small effect category ($0.02 \leq f^2 < 0.15$). This indicates that trust still plays a role in driving the adoption of ChatGPT among SMEs, but the decision to adopt is also heavily influenced by other factors such as religious values and perceptions of the technology itself.

8. The Moderating Effect of Religiosity and Trust in ChatGPT on the Adoption of ChatGPT

The interaction between religiosity and trust in ChatGPT on the adoption of ChatGPT has an f^2 value of 0.036, which falls within the small effect category ($0.02 \leq f^2 < 0.15$). This finding indicates that religiosity can strengthen the influence of trust on the adoption of ChatGPT; however, its moderating effect is relatively limited, thus acting as an additional reinforcing factor in the technology adoption model for SMEs.

Discussion

The Influence of Environmental Factors on Trust in ChatGPT

The results of this study indicate that environmental factors play a role in shaping SME operators' trust in ChatGPT. Conceptually, the external environment—which encompasses competitive pressures, market dynamics, and the legitimacy of digital technology use—also influences individuals' perceptions of the technology's reliability and suitability. In the context of SMEs, increasingly intensive digital transformation creates adaptive pressures, so that the use of artificial intelligence-based technologies, such as ChatGPT, is viewed as a strategic necessity for maintaining competitiveness.

These findings align with the Technology-Organisation-Environment (TOE) framework, which positions environmental factors as key determinants in technology adoption (Tornatzky & Fleischer, 1990; Oliveira & Martins, 2011). Recent studies also indicate that competitive pressures and digital ecosystem support contribute to the acceptance of AI-based technologies among SMEs (Awa et al., 2023).

However, this study found that the environmental influence on trust is negative. This suggests that an unstable or not yet fully supportive external environment can actually reduce the level of trust in the technology. This finding differs from some previous research, which tended to find a positive relationship (Baker, 2012). This discrepancy can be explained by the characteristics of generative AI technology, which is still relatively new and not yet fully understood by SME stakeholders. Uncertainty regarding regulations, the risk of system errors, and ethical issues surrounding the use of AI can create a perception of high risk, meaning that the environment functions not only as a driver but also as a source of doubt regarding the technology.

The Influence of Organisational Factors on Trust in ChatGPT

This study indicates that organisational factors play a role in shaping trust in ChatGPT. Management support, resource readiness, and an organisational culture open to innovation have proven to be key elements in enhancing users' confidence in the technology.

These findings are consistent with the TOE theory, which asserts that organisational readiness is a key factor in the successful adoption of technology (Tornatzky & Fleischer, 1990; Zhu et al., 2006). Recent research also indicates that organisational capabilities and digital leadership contribute significantly to driving the acceptance of AI-based technology (Bag et al., 2021).

However, some studies suggest that organisational factors are not always the primary determinants, particularly when users' direct experience with the technology is more dominant (Venkatesh et al., 2012). This discrepancy can be explained by the fact that this study positions trust as a mediating variable, meaning that organisational factors play a role in shaping initial perceptions before influencing adoption decisions. Thus, this study, ' ', expands the understanding that organisations not only provide resources but also shape beliefs regarding technology.

The Influence of Perceived Ease of Use on Trust in ChatGPT

The research findings indicate that perceived ease of use plays a crucial role in shaping trust in ChatGPT. Ease of use makes the technology easier to understand, thereby reducing uncertainty and enhancing user confidence.

This finding aligns with the Technology Acceptance Model (TAM), which identifies perceived ease of use as a key determinant in technology adoption (Davis, 1989). Studies integrating TAM with trust also indicate that ease of use significantly influences the formation of trust (Gefen et al., 2003).

However, some recent research suggests that the influence of ease of use is not always direct on adoption, but rather mediated through other variables such as perceived usefulness or user satisfaction (Chatterjee et al., 2023). In the context of Indonesian SMEs, varying levels of digital literacy make ease of use a crucial factor. Therefore, perceived ease of use in this study functions not only as a determinant of adoption but also as a key foundation for building trust in the technology.

The Influence of Perceived Usefulness on Trust in ChatGPT

This study demonstrates that perceived usefulness influences the formation of trust in ChatGPT. When technology is perceived to provide tangible benefits, such as improved operational efficiency and effectiveness, users' level of trust in the technology increases.

This finding is consistent with the Technology Acceptance Model (TAM), which identifies perceived usefulness as a key factor in technology adoption (Davis, 1989; Venkatesh & Davis, 2000). Research integrating trust also indicates that perceived benefits can reinforce confidence in the system (Gefen et al., 2003).

However, some studies suggest that perceived usefulness is more dominant in influencing usage intention than trust (Alalwan et al., 2017). This difference can be explained by the SME context, where benefits alone are insufficient to drive adoption. Business owners also require confidence that the technology is safe and reliable. Thus, perceived usefulness in this study operates through trust as a psychological mechanism prior to driving adoption.

The Influence of Technological Factors on Trust in ChatGPT

The research findings indicate that technological factors influence the formation of trust in ChatGPT. System quality, technological reliability, and compatibility with business needs are key elements in building user trust.

These findings align with the TOE theory and the diffusion of innovation theory, which emphasise that technological characteristics are the primary determinants of innovation adoption (Tornatzky & Fleischer, 1990; Rogers, 2003). Recent research also indicates that technological quality has a significant influence on trust in the use of AI (Dwivedi et al., 2021).

However, in organisations with a high level of digital maturity, technological factors are not always the primary determinants (Warner & Wäger, 2019). In the context of this study, SMEs have varying levels of technological readiness, meaning that technological quality remains a fundamental factor in shaping trust.

The Influence of Trust in ChatGPT on the Adoption of ChatGPT

This study indicates that trust is a key factor in driving the adoption of ChatGPT. Trust in the technology reflects the belief that the system is reliable, secure, and delivers the expected benefits.

These findings are consistent with research that identifies trust as the primary determinant in the adoption of digital technology, particularly in AI-based systems (Gefen et al., 2003; McKnight et al., 2011). Recent studies also confirm that trust plays a significant role in the acceptance of generative technologies such as ChatGPT (Dwivedi et al., 2023).

However, some studies suggest that trust does not always have a direct influence on adoption, but rather acts through other variables such as perceived value or satisfaction (Kim et al., 2009). In the context of SMEs, adoption decisions have direct implications for business operations, making trust a more dominant and direct factor in influencing technology usage decisions.

The Influence of Religiosity on the Adoption of ChatGPT

This study demonstrates that religiosity plays a role in influencing the adoption of ChatGPT. Individual values and beliefs have been shown to be key factors in determining technology acceptance.

These findings align with research showing that religiosity influences technology adoption behaviour, particularly in societies with high levels of religiosity (Aji et al., 2020). Furthermore, religiosity can shape perceptions of technology and influence usage decisions (Abdullah & Ward, 2016).

However, some research indicates that religiosity can act as a barrier to adoption if the technology is perceived as incompatible with moral values (Souiden & Rani, 2015). In this study, ChatGPT was perceived as a neutral and flexible technology; consequently, religiosity actually strengthened acceptance of the technology when users felt it did not conflict with their held values.

The Moderating Role of Religiosity in the Relationship Between Trust and Adoption

The research findings indicate that religiosity strengthens the relationship between trust and ChatGPT adoption. This suggests that trust in the technology is more effective in driving adoption when the technology aligns with an individual's values and beliefs.

This finding extends previous research, which generally treated religiosity solely as a direct variable (Aji et al., 2020). This study makes a new contribution by demonstrating that religiosity also functions as a moderating variable that strengthens the relationship between constructs within the technology adoption model.

Thus, this study confirms that psychological factors and individual values, particularly religiosity, not only directly influence adoption decisions but also reinforce the mechanism linking trust and technology usage behaviour.

Conclusion

This study aims to analyse the factors influencing the adoption of ChatGPT in human resource management practices within Small and Medium-sized Enterprises (SMEs) in Indonesia through the integration of the Technology-Organisation-Environment (TOE) framework and the Technology Acceptance Model (TAM), whilst considering the mediating role of trust and the moderating role of religiosity. The results indicate that the adoption of ChatGPT in SMEs is a complex and multidimensional phenomenon, influenced not only by technological, organisational, and environmental factors, but also by user perceptions and individual values. These factors play a role in shaping trust in the technology, which in turn becomes the key driver of adoption decisions. Perceived ease of use emerges as the most dominant factor in building trust, followed by the perceived benefits experienced by users. These findings confirm that, in the context of SMEs, technology is more readily accepted when it not only provides tangible benefits but is also easy to use in day-to-day operational activities. Furthermore, trust in ChatGPT has proven to be the primary determinant in driving adoption, indicating that confidence in the technology's reliability, security, and credibility are crucial factors in the process of accepting AI-based technology. Furthermore, religiosity plays a significant role, both as a direct factor influencing adoption and as a moderating variable that strengthens the relationship between trust and adoption. This indicates that, in the context of SMEs in Indonesia, decisions regarding technology use are not solely based on rational and functional considerations but are also influenced by alignment with individual values and beliefs.

Overall, this study confirms that trust is a key mechanism bridging the influence of technological, organisational, environmental, and user perception factors in shaping ChatGPT adoption behaviour, thereby yielding a more comprehensive and contextual technology adoption model. This study makes a theoretical contribution by integrating the TOE and TAM frameworks into a single, more comprehensive model to explain the adoption of artificial intelligence-based technology. This integration broadens our understanding of how structural factors (technology, organisation, and environment) interact with user perception factors in shaping adoption behaviour. Furthermore, this study enriches the TAM model by incorporating trust as a primary mediating variable, demonstrating that technology acceptance is not solely based on perceptions of ease and benefits, but also on the user's level of confidence in the technology. Another significant contribution is the inclusion of religiosity as a moderating variable, introducing a socio-cultural dimension to technology adoption studies. These findings suggest that individual values and beliefs can strengthen the relationship

between trust and adoption, thereby broadening the theoretical perspective in explaining technology acceptance within the context of developing countries, particularly Indonesia.

In practical terms, this research has important implications for various stakeholders. For SME operators, the findings underscore the importance of enhancing digital literacy and experience with technology to build trust in AI-based systems. Training programmes and mentoring in the use of ChatGPT could serve as effective strategies to boost adoption rates. For technology developers, these findings indicate that system design must not only focus on technical sophistication but also on ease of use, practical benefits, as well as security and transparency. Strengthening these elements will increase user trust in AI technology. Meanwhile, for governments and policymakers, the results of this study emphasise the importance of creating a conducive digital ecosystem through clear regulations, strengthening digital infrastructure, and sustainable technology literacy programmes. A policy approach that takes local and religious values into account is also important for increasing the acceptance of technology among SMEs.

This study has several limitations that should be noted. Firstly, this study employs a cross-sectional approach, meaning it is unable to capture the dynamics of changes in perceptions and technology adoption behaviour over the long term. Yet, the adoption of AI-based technology is a process that develops gradually. Secondly, the study's scope is limited to SMEs in Central Java, East Java, and the Special Region of Yogyakarta (DIY), so generalising the findings to other regions or countries must be done with caution. Thirdly, this study focuses on variables within the TOE and TAM frameworks, supplemented by trust and religiosity; consequently, there remains the possibility of other factors not yet accommodated within the model, such as psychological factors, user experience, or social influence. Fourthly, the data used is based on respondents' perceptions, and thus has the potential to contain subjective bias influenced by individuals' experiences and interpretations of the technology.

Given these limitations, future research is recommended to adopt a longitudinal approach to observe changes in technology adoption behaviour more dynamically over time. This approach will provide a deeper understanding of the process of AI-based technology acceptance. Furthermore, future research could expand the scope of the study to other sectors or conduct comparative studies across regions or countries to test the model's consistency in different contexts. Further research is also recommended to include other relevant variables, such as perceived risk, social influence, digital literacy, or innovation capability, to enrich the model and enhance its explanatory power. The use of a mixed-methods approach combining quantitative and qualitative data could also provide a more comprehensive insight into users' experiences in adopting technology. Finally, future research needs to pay greater attention to the ethical and governance aspects of artificial intelligence usage, given the rapid pace of technological development. This is important to ensure that technology adoption is not only operationally effective but also socially responsible and aligned with prevailing societal values.

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