



The Factors Shaping Artificial Intelligence (AI) Adoption in the South African Accounting Ecosystem

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Abstract: The rapid evolution of artificial intelligence (AI) continues to transform accounting practices worldwide, with a profound impact on professional roles, education, and ethical governance. This study explores these determinants that shape AI adoption within the South African accounting ecosystem, with more emphasis on technological readiness (TR), professional transformation, accounting education, and ethical tensions. Following a qualitative approach based on secondary data, the study synthesizes existing empirical studies, professional reports, and policy documents. The research reveals that while AI enhances efficiency, accuracy, and strategic decision-making in accounting, the adoption level remains uneven because of skill shortages, ethical tensions, and institutional readiness constraints. The study further highlights the misalignment between industry-driven technological change and accounting education curricula. Through the Technological-Organization-Environmental (TOE), Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of Innovation (DOI), and technology readiness frameworks integration, the study contributes to a contextualized comprehension of AI adoption in developing economies and provides actionable insights for educators, professional bodies, and policymakers seeking to promote responsible and sustainable AI integration in accounting.

Keywords: Artificial Intelligence, Accounting, Technology Readiness, Education

JEL Classification: M41, I23, O31, O33

1. Introduction

The rapid advancement of digital technologies continues to revolutionize the role of accountants and refine accounting practices globally, and the South African accounting profession is no exception (Moll & Yigitbasioglu, 2019). As a result of the emergence of technologies such as Artificial Intelligence (AI), Blockchain, and data analytics, the way accountants perform their duties has significantly changed over the years (SAICA, 2023). The evolution of AI from a theoretical lens in the 1950s to a core driver of digital transformation has shown its capabilities to imitate human intelligence in areas such as decision-making, pattern recognition, and communication (Dwivedi et al., 2021; Zhang et al., 2023). The

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integration of AI into accounting systems improves the predictive capacity, accuracy, and speed of financial analysis while enabling accountants to shift their focus to strategic decision-making and advisory functions (Bishop, 2020; Moloi & Obeid, 2024).

In the South African context, these developments in technology align closely with the country's digitalization objective under the Fourth Industrial Revolution (4IR), which emphasizes the importance of competitiveness, innovation, and inclusivity across all sectors (Maisera, 2024; SAICA, 2025). However, the degree to which the accounting practices and higher education institutions embrace these technological advancements largely depends on their TR and the ethical and governance frameworks guiding their adoption. The emergence of technology has outstripped the readiness of many accounting professionals and educational institutions in South Africa to adapt effectively. The accounting profession has undergone significant changes as a result of advancements in cognitive machine technologies, particularly in the development and application of AI (Anh et al., 2024). As a result, there is growing concern that the profession may face a widening skills and ethical gap between the technological capabilities required in practice and those cultivated through existing education and training systems.

The Adoption of AI positions the accounting workforce of South Africa within a global competitive economy and presents unprecedented opportunities and challenges (Handoko et al., 2019). AI systems are increasingly automating routine and repetitive tasks such as data entry, reconciliations, and basic reporting (Allioui & Mourdi, 2023), while accountants are faced with a dual responsibility to acquire advanced AI-related competencies and ensure ethical reasoning (Jackson et al., 2023). As AI continues to proliferate in domestic accounting practices, graduates risk lacking critical tech skills and AI literacy for success in accounting and tech-specialized roles. Several studies confirm that employers demand technological skills and proficiency from graduates (Cory & Pruske, 2012; Damerji & Salimi, 2021; Spraakman et al., 2015). These demands underscore the need for South African universities to update their curricula to match the current trends and skills requirements, increasing the potential employability of graduates (Damerji & Salimi, 2021; Tempone et al., 2012). South African accounting education lags despite global accounting firms investing heavily in tech advancements.

Professional bodies and educators globally have started to examine how ethical reasoning frameworks in accounting education can be refined to align with AI-infused environments. Numerous studies purport that while there's significant development in technical competencies in AI and data analytics, the ethical concerns, such as responsible integration of generative AI, fairness in automated audit, and algorithmic bias awareness, remain underdeveloped and given limited attention (Damerji & Salimi, 2021). This concern calls for an ethical AI literacy framework that enables graduates to critically evaluate the social costs and trustworthiness of AI tools utilized in financial and assurance practices (Garrett et al., 2020; Moloi & Obeid, 2024). In this regard, the accounting education system in emerging economies still lags in ethical competencies, and the way it is operationalized is limited.

1.1. Problem Statement and Research Objectives

The emergence of technology, particularly AI, has significantly reshaped the accounting and auditing industry, resulting in fundamental changes through advancements in cognitive machine technologies. The pace of technological change has outstripped the readiness of many accounting professionals and

educational institutions in South Africa to adapt effectively. As a result, there is growing concern that the profession may face a widening skills and ethical gap between the technological capabilities required in practice and those cultivated through existing education and training systems. The problem lies in the lack of understanding of how TR, mediated by Performance Expectancy and Effort Expectancy, affects AI adoption intentions, potentially impeding the profession's ability to optimize real-time processes and maintain competitiveness in an AI-driven environment. Despite national initiatives to advance digital transformation—such as the AI Maturity Assessment Framework launched by the Council for Scientific and Industrial Research (CSIR) and the South African Institute of Chartered Accountants (SAICA)—the accounting profession's preparedness for AI integration remains uneven. Moreover, ethical concerns related to algorithmic bias, data privacy, and accountability in automated decision systems remain largely unaddressed in both professional regulation and accounting education. The fundamental problem facing South African accounting education is the absence of a coherent and systematic approach to integrating AI ethics into curricula and training programmes.

This gap underscores a need for investigations that enrich scientific knowledge on AI adoption and suggest training policies for businesses, particularly in regions with rapid technological shifts but underdeveloped adoption models. This gap also underscores the importance of student awareness of ethical AI principles and adequate educator readiness to teach and assess these competencies. As a result, there is a risk that graduates may enter the profession with strong technical proficiency but inadequate ethical grounding to ensure responsible AI integration in accounting and auditing contexts.

In line with this problem statement, the study sought to achieve the following research objectives:

- To explore the role of Technology Readiness in Adopting Artificial Intelligence in Accounting Firms;
- To explore the impact of AI on accounting professionals' roles in South Africa and ethical considerations to ensure responsible integration;
- To evaluate the role of technology readiness and Accounting Students' Perceptions of adopting Artificial Intelligence within South African higher education;
- To assess AI ethics in accounting education to promote responsible integration.

2. Literature Review

2.1. Technological Readiness

In the context of new technology adoption, Technological Readiness (TR) is defined as the people's propensity to embrace and use advanced innovative tools in their personal and professional routines. People's perceptions of a particular technology can include elements that may be favourable or unfavourable, which can influence their intentions to implement it (Anh et al., 2024). TR incorporates drivers of adoption – innovation, optimism, discomfort, and security. The Technological Readiness Index (TRI) evaluates TR through these key personality traits (Anh et al., 2024). Optimism refers to the conviction that technology enhances oversight, adaptability, utility, and productivity. Innovativeness involves a trailblazing mindset towards technology and intellectual guidance. Discomfort represents the potential absence of evaluation and control over technology. Lastly, insecurity signifies uncertainty of technology, particularly its reliable operation. However, these technologies are different across people,

and various technologies are frequently used. As noted by Parasuraman and Colby (2015), TR serves as a strong intention indicator regarding the use of technology. Studies like (Crosbie et al., 2018; Larasati & Santosa, 2017; Parasuraman & Colby, 2015) indicate that those with high TR levels are well-positioned to adopt and engage with cutting-edge technologies. Studies (Nga et al., 2023; Paudel et al., 2023; Salman & Ismael, 2023; Son et al., 2023) further demonstrate that TR has a positive effect on perceptions of technology's benefits and the probability of embracing novel innovations. The extent of TR significantly affects how AI tools are being utilized in the accounting and auditing tasks of students (Damerji & Salimi, 2021).

2.2. AI Integration into Accounting Systems

AI integration into accounting has reshaped traditional accounting systems, which were once dominated by manual processes and linear workflows (Odonkor et al., 2024). Accounting information systems have evolved from not just being paper-based journals and ledgers because of the introduction and continued improvement in computer systems. The manual processes of accounting were time-consuming and subject to human error, and hindered financial reporting and analysis efficiency (Odonkor et al., 2024). Computer systems resulted in the development of vast databases of limited accounting (Mohammad et al., 2020). Accounting is a field traditionally anchored in human judgment, precision, and compliance; AI has redefined these operational paradigms not only in accounting but across all industries. South African accounting firms are faced with a dual imperative of the potential benefits that come with AI, such as efficiency and accuracy, while issues such as ethical tensions and socio-economic challenges. The introduction of AI in computer accounting systems is one of the possible solutions to these problems, with the emphasis being made on the development of systems that can react, work like humans, and do tasks like problem-solving, planning, and learning. As a result, particularly with the advent of AI, the accounting landscape has undergone a significant transformation (Odonkor et al., 2024). Mohammad et al. (2020) highlight that AI has a concerning history within the accounting space and has been applied and functional for over 25 years in the accounting and auditing field. As indicated by the University of Oxford study, which reveals that 95% of accounting professionals will probably lose their jobs due to the automation of accounting tasks (Mohammad et al., 2020).

2.3. AI Adoption in Accounting Education

South African accounting education lags despite global accounting firms investing heavily in tech advancements. Current accounting curricula from most higher institutions often lack AI courses, leaving students unprepared for AI-driven environments and industry shifts. As AI continues to proliferate in domestic accounting practices, graduates risk lacking critical tech skills and AI literacy for success in accounting and tech-specialized roles. In a study on self-assessed knowledge, it was found that accounting students rated office tools higher, and advanced technologies, audit automation, and complex systems below average (Strong & Portz, 2015). The participants of this study included mostly junior or senior students in the Accounting Information Systems courses. Stoner (2009) conducted a similar study tracking first-year accounting students' self-evaluation on IT skills over a decade and noted overall progress. The evaluation covered operational systems, office software, the internet, statistics, and databases.

Whilst academics and policymakers continue to strive for the highest level of education, emphasizing the importance of future accounting leaders remains critical. As a result of emerging AI amid 4IR, the roles of accountants and auditors have transformed over the past decade and will continue to evolve as technologies continue to advance. This underscores the need to equip the new graduates for automation-heavy positions through training programs that align with these shifting job demands and advanced sector practices. In examining changes in industry and 4IR, a literature-based review reasoned action theory proposes a relationship between the technology readiness of South African accounting students and obtaining skills to meet the employer demands (Damerji & Salimi, 2021).

2.4. AI Ethics

The Adoption of AI positions the accounting workforce of South Africa within a global competitive economy and presents unprecedented opportunities and challenges (Handoko et al., 2019). AI systems are increasingly automating routine and repetitive tasks such as data entry, reconciliations, and basic reporting (Alliou & Mourdi, 2023), while accountants are faced with a dual responsibility to acquire advanced AI-related competencies and ensure ethical reasoning (Jackson et al., 2023). As firms integrate AI into decision-making, ethical concerns surrounding data privacy, algorithmic bias, and professional accountability continue to grow and have become prominent (Igou et al., 2023; Zhang et al., 2023). These developments underscore the need for a contextual understanding of how AI integration into accounting impacts the South African accounting profession, particularly in transforming the roles, competencies, and ethical framework underlying professional conduct.

Similarly, the integration of AI ethics into accounting education faces unique constraints such as readiness disparities across education, policy, and governance domains. This underscores the critical development of ethical AI integration. Although South African accountants recognise the perceived benefits of AI and its potential to enhance efficiency and improve accuracy, many are concerned with ethical accountability when AI output conflicts with professional judgement. This highlights an “ethical skills gap” in accounting education programs and professional training. In this regard, accounting educators or instructors have a dual responsibility to equip students with technological skills while promoting ethical integration towards AI-intensive practices. Numerous emerging studies on AI ethics in education highlight that ethical competencies are better developed via integrative pedagogies that encompass AI case studies, professional dilemmas, and experimental learning (Butler et al., 2021; Grosz et al., 2019). This approach is assumed to aid students in navigating the unclear boundaries between human accountability and machine autonomy. This highlights the importance of ethical discourse in the classroom for prompts such as who is responsible for algorithmic audit errors or whether too much reliance on generative AI technologies compromises professional and independent judgment (Gu et al., 2024; Holmes & Porayska-Pomsta, 2023).

3. Theories Underpinning the Study and their Unique Insight into AI Adoption

3.1. Technological-Organizational-Environmental (TOE) Framework

This framework offers insights into technology adoption by providing a macro-level structure, integrating three contexts - technological, organizational, and environmental- critical to account for

broad drivers in South African firms. The TOE framework emphasizes AI-driven tools' compatibility with existing practices and systems, and how regulatory frameworks like POPIA and firm resources shape technology implementation (Oliveira & Martins, 2011; Tornatzky et al., 1990). Its comprehensive approach makes it a robust grounding theory for capturing internal and external drivers.

3.2. Diffusion of Innovation (DOI) Theory

This theory provides insights into technological adoption stages and innovation attributes at a micro-level structure, emphasizing attributes like relative advantage, compatibility, complexity, trialability, and observation (Alqahtani & Orji, 2020; Rogers, 2003; Rogers & Williams, 1983). This approach provides an understanding of how professional accountants perceive AI-driven tools in a context where skill shortages or constraints are prominent. These attributes are essential in South African firms, where perceived AI benefits differ across different professionals. DOI complements TOE by addressing the TOE's limited focus on innovation-specific factors.

3.3. Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT uses four core constructs – Performance expectancy, effort expectancy, social influence, and facilitating conditions to understand and explain individual technology acceptance, which is crucial in professional services (Venkatesh et al., 2003). These four constructs are characterized by age, gender, and experiences. UTUAT complements other theories by predicting behavioural behaviour and usage of AI on an individual level (Maduku et al., 2016). This approach is critical in professional services where the professional accountants' experience and voluntariness drive the adoption of AI.

4. Methodology

The study follows a qualitative research design based on secondary data to explore the factors shaping AI adoption within the South African accounting ecosystem. A qualitative approach is appropriate as the study seeks to interpret, synthesise, and contextualise existing empirical evidence, policy documents, and scholarly literature rather than measure causal relationships or test hypotheses statistically. The rationale for adopting a secondary research approach – substantial global literature exists on technology adoption and students' readiness; however, findings remain fragmented across disciplines. This study follows a systematic literature review approach to synthesize an increasingly growing body of literature on AI in accounting ecosystems and its implications for accountants and accounting students. AI in accounting is an emerging research and interdisciplinary field that underscores the appropriateness of the SLR methodology. This methodology enables the structured identification, evaluation, and integration of existing evidence while mitigating selection bias and enhancing transparency (Denyer & Tranfield, 2009; Tranfield et al., 2003).

To ensure methodological rigor, replicability, and transparency, the study adopts the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Page et al., 2022). The PRISMA framework provides a structured process for identifying, screening, assessing eligibility, and including literature. This approach aids in identifying dominant research themes, evaluating

methodological approaches, and highlighting gaps for future research agendas. This SLR adopts a predefined review protocol that enhances reliability and consistency, unlike traditional narratives, which could be subjective and not replicable. This study focuses on peer-reviewed articles and expert opinion reports in the field. This approach enables the integration, comparison, and interpretation of prior datasets to extrapolate theoretical insights, identify trends, and evaluate relationships between TR, UTUAT constructs, DOI, TOE framework, and AI adoption among accounting students. The study utilises a qualitative synthesis complemented by narrative integration and conceptual mapping, which aligns with established guidelines for secondary analysis in educational and behavioural studies. The secondary data were sourced from widely used academic databases and professional reports to ensure a comprehensive and balanced representation of knowledge. Key databases included Google Scholar, Scopus, Web of Science, JSTOR, and EBSCOhost. These databases were selected because of their coverage of peer-reviewed articles in technology adoption, accounting, and AI. Moreover, reports from organizations such as the South African Institute of Chartered Accountants (SAICA), global accounting bodies, and the International Federation of Accountants (IFAC) were reviewed, providing insight from a global perspective.

4.1. Key Search Terms

Key search terms included “technological readiness”, “AI adoption”, “Accounting”, “Education”, and “developing economies,” while variations included UTAUT-related terms such as “performance expectancy”, “effort expectancy”, “mediation”, TOE framework, DOI, and technology readiness integration. Policy documents and competency frameworks relevant to AI and accounting education were also collected for review. Furthermore, industry reports on AI adoption in accounting and auditing were also reviewed. Sources selected were published in English, directly addressed TR, AI adoption, or related models in accounting or broader sectors, provided generalizability insight, provided empirical evidence, theoretical discussions, or professional reports relevant to mediating constructs or developing contexts, and provided data applications to South Africa or similar developing economies. Sources not selected were not peer-reviewed without credible backing, focused solely on non-professional sectors without adoption theory connections, or were outdated unless foundational. Technical AI studies unrelated to accounting practice and duplicated or methodologically weak publications were also part of the excluded sources. After this procedure, 30 studies were included in the review as they directly contribute to the phenomenon in question.

5. Results and Discussion

5.1. Technological Readiness as a Key Enabler of AI Adoption

The synthesis of the reviewed literature indicates that TR is one of the most influential determinants of AI adoption in the South African ecosystem. Across the reviewed studies, TR extends beyond the availability of technological infrastructure to include readiness, confidence, and willingness of individuals and organizations to embrace emerging technologies. The TRI, comprising optimism, innovativeness, discomfort, and insecurity, consistently emerged as an important predictor of AI adoption intentions. The reviewed literature suggests that accountants and accounting students who exhibit higher levels of optimism and innovativeness are more likely to perceive AI technologies as

valuable tools for improving efficiency, enhancing decision-making, and reducing repetitive manual tasks. Conversely, discomfort and insecurity associated with AI – particularly about system reliability – act as significant barriers to adoption. These findings are consistent across developed and developing economies, although the barriers appear more pronounced in emerging economies due to uneven digital maturity. These findings support Technology Readiness Theory, which argues that positive perceptions towards technology significantly increase adoption intentions. Furthermore, when interpreted alongside the UTAUT framework, TR enhances both performance expectancy, thereby increasing the likelihood of AI acceptance among accounting professionals.

5.2. AI is Transforming the Role of Accounting Professionals

The reviewed studies consistently demonstrate that AI is fundamentally transforming traditional accounting functions. Rather than replacing accountants entirely, AI increasingly automates repetitive, rule-based tasks including bookkeeping, transaction processing, reconciliation, invoice management, and routine audit procedures. This automation allows accounting professionals to redirect their effort towards higher-value activities such as strategic financial analysis, advisory services, business intelligence, and organizational decision-making. Several studies highlight that AI improves processing speed, reduces human error, strengthens fraud detection capabilities, and enhances predictive financial analytics. Machine learning algorithms and intelligent automation systems increasingly support auditors by identifying anomalies within large financial datasets that would otherwise remain undetected using conventional audit procedures.

Despite these benefits, the literature reveals persistent concerns regarding workforce transformation. Many accounting professionals perceive AI as both an opportunity and a threat. While AI creates demand for analytical, technological, and strategic competencies, it simultaneously reduces demand for traditional transactional accounting roles. Consequently, accountants are expected to develop new competencies including data analytics, AI literacy, critical thinking, digital governance, and interdisciplinary problem-solving. These findings align closely with the DOI theory. AI adoption is accelerated when professionals perceive AI technologies as offering clear relative advantages, comparability with existing practices, and manageable implementation complexity.

5.3. AI Adoption in Accounting Education Remains Uneven

A dominant theme emerging from the literature concerns the growing disconnect between technological developments within the accounting profession and the readiness of higher education institutions. The reviewed literature studies consistently indicate that accounting curricula have not evolved at the same pace as technological innovation, leaving many graduates insufficiently prepared for the AI-driven workplace. Several studies report that accounting students generally possess adequate proficiency in conventional office applications while demonstrating limited knowledge of AI technologies, machine learning applications, robotic process automation, and advanced data analytics. Employers increasingly expect graduates to possess these competencies, yet many university programmes continue to emphasize traditional accounting content with limited exposure to emerging technologies. The literature further highlights that AI education should extend beyond technical training to include practical problem-solving, interdisciplinary collaboration, and critical evaluation of AI-generated outputs. Graduates

entering AI-enabled workplaces require the ability to interpret AI recommendations rather than simply operate AI software.

The reviewed literature therefore suggests that curriculum redesign represents one of the most important interventions required to enhance TR among future accounting professionals. Universities should strengthen partnerships with professional accounting bodies and industry to ensure curriculum relevance and improve graduate employability. These findings support the UTAUT framework, particularly the role of facilitating conditions and performance expectancy in influencing technology acceptance among students. Educational institutions therefore play a central role in creating enabling environments that foster AI adoption.

5.4. Ethical and Governance Considerations Remain Critical for Sustainable AI Adoption

Beyond technological capabilities, the literature consistently identifies ethical governance as a prerequisite for responsible AI adoption within accounting. While AI improves efficiency and analytics capability, its implementation introduces significant ethical concerns surrounding accountability, transparency, algorithm bias, professional judgement, and regulatory compliance. Many reviewed studies emphasize that accountants remain professionally responsible for financial decisions even when AI systems generate recommendations or automate analytical processes. This creates uncertainty regarding accountability when algorithmic decisions result in financial misstatements or audit failures. Consequently, AI should be viewed as a decision-support tool rather than a substitute for professional judgement.

Data governance also emerged as a significant concern. AI systems depend upon large volumes of organizational data, increasing risks associated with confidentiality, cybersecurity, and compliance with data protection legislation such as POPIA. These concerns are particularly relevant within South Africa, where regulatory frameworks continue to evolve alongside technological advancement. The literature further indicates that ethical AI competence remains insufficiently incorporated within accounting education. Although students increasingly learn about digital technologies, relatively few programmes explicitly address AI ethics, algorithmic fairness, transparency, explainability, or responsible AI governance. The findings suggest that responsible AI adoption requires coordinated efforts among universities and professional accounting bodies, regulators, and accounting firms to develop ethical governance frameworks alongside technological capability. Sustainable AI implementation depends upon balancing innovation with accountability, transparency, and professional integrity. These findings reinforce the TOE framework, which recognizes that organizational governance structures and external regulatory environments significantly influence successful technology adoption.

6. Conclusion

This study explored the factors shaping the adoption of artificial intelligence in the South African ecosystem through a qualitative synthesis of secondary data. Drawing on established technology adoption theories underpinning this study, the research demonstrates that technological readiness, organizational context, educational readiness, and ethical consideration collectively influence the extent to which AI is embraced within both practice and education. While AI provides benefits such as

improved efficiency, enhanced decision-making, and expanded advisory roles, research shows persistent challenges in relation to skill gaps, ethical governance, regulatory uncertainty, and curriculum misalignment. These challenges are particularly pronounced in developing markets where institutional readiness varies significantly. The study contributes to accounting and technology adoption literature by contextualising worldwide AI adoption frameworks within South Africa and highlighting the critical role of ethical AI literacy in accounting education. Practically, the research suggests that coordinated effort among professional bodies, higher education, and policymakers is essential in ensuring responsible AI integration. Future research may draw on this study by incorporating primary data to empirically validate the conceptual insights presented.

6.1. Contribution of the Study

The study's contribution to both academic discourse and practice underscores its significance. Academically, the study enriches AI adoption literature by qualitatively synthesising empirical evidence through the integration of TR, UTAUT, TOE, and DOI frameworks within the South African accounting context. Practically, the study provides actionable insights for policymakers, professional bodies, and educational institutions on designing interventions to improve accountants' readiness and enabling firms to leverage 4IR for sustainable growth and AI-driven accounting systems. The results will also inform strategies at a firm level on balancing governance, professional integrity, and advanced technological innovation. These outcomes will ensure South Africa's broader digital objectives under 4IR of becoming a competitive and digitally driven economy and acting as a basis for inclusive technological advancement in an underrepresented emerging economy.

By exploring the use perceptions' mediation on the tie between students' technology readiness and AI adoption, South African universities that offer not only accounting programs can more effectively embed AI teaching and learning. Broadly, they can devise course strategies incorporating TR elements influencing AI adoption. Incorporating AI and data analytics into curricula can capture the adoption lag between academia and the accounting/auditing sector, equipping students for the AI-intensive environment. Additionally, it aims to contribute to the growing body of scholarship on AI ethics in accounting education, while offering contextually relevant recommendations for curriculum design, policy development, and professional training. Ultimately, the study responds to global and national calls for responsible innovation, where ethical integrity becomes the cornerstone of technologically empowered accounting practice.

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