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Intellectual Capital, Service Innovation, and Generation Z Performance: A Systematic Review

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Abstract

This systematic literature review examines how intellectual capital enhances Generation Z employee performance through service innovation in the banking sector. Following the PRISMA 2020 guidelines, 36 peer-reviewed studies published between 2010 and 2026 were systematically identified and synthesised using thematic analysis. Four themes emerged: intellectual capital as a strategic resource, intellectual capital driving service innovation, service innovation improving employee performance, and research gaps relating to Generation Z. Based on these findings, an integrated conceptual framework is developed, positioning service innovation as the mediating mechanism linking intellectual capital to employee performance. The review offers theoretical insights and practical implications for banking institutions undergoing digital transformation.

Keywords: Intellectual Capital; Service Innovation; Generation Z; Performance

1.0 Introduction

Organizations are increasingly operating in knowledge-driven and digitally connected environments characterized by rapid technological advancement, evolving customer expectations, and intense global competition. The adoption of artificial intelligence (AI), financial technology (FinTech), big data analytics, and digital platforms has fundamentally transformed how banks create value and sustain competitive advantage. Consequently, tangible assets alone are no longer sufficient to achieve superior organisational performance. Instead, financial institutions increasingly rely on intellectual capital, innovation capability, and a digitally competent workforce to enhance competitiveness and respond effectively to changing market conditions.

Within this context, Generation Z has emerged as an increasingly important workforce cohort, bringing strong digital competencies, adaptability, and innovation-oriented work preferences that support organisational transformation. At the same time, banking institutions must develop effective strategies to leverage these capabilities through knowledge management, organisational learning, and service innovation (Jikhan et al., 2023). As a result, intellectual capital—comprising human, structural, and relational capital—is increasingly recognized as a strategic organisational resource that facilitates innovation and enhances organisational performance (Alhasani et al., 2023; Ali et al., 2021; Buenaño et al., 2025).

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Although substantial research has examined intellectual capital, service innovation, and employee performance (Anggiani & Fatonah, 2025; Oraibi et al., 2024), these constructs have largely been investigated independently or through pairwise relationships. Existing studies have increasingly explored Generation Z employees and digital transformation within banking (Pertiwi et al., 2020); however, the evidence remains fragmented across different theoretical perspectives and organisational contexts (Setyaningrum et al., 2025; Sidharta et al., 2019). Consequently, there is limited understanding of how intellectual capital contributes to employee performance through service innovation, particularly among Generation Z employees in the Malaysian and Indonesian banking sectors (Zulkifli et al., 2023). Rather than addressing a lack of research, this study responds to the need for an integrated synthesis that consolidates existing evidence and clarifies the interrelationships among these constructs.

Accordingly, this study systematically reviews the literature on intellectual capital, service innovation, and employee performance to develop an integrated conceptual framework explaining their relationships within the context of Generation Z employees in the banking sector. By synthesizing recent empirical evidence, the review identifies emerging research trends, unresolved issues, and future research directions with particular relevance to Malaysia and Indonesia.

The remainder of this paper is organised as follows. Section 2 describes the systematic review methodology based on the PRISMA 2020 guidelines. Section 3 presents the thematic synthesis of the selected studies. Section 4 proposes an integrated conceptual framework derived from the review findings, while Section 5 concludes the study by discussing its theoretical contributions, practical implications, and future research directions.

2.0 Methodology

This systematic literature review followed the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Page et al., 2021) to synthesise evidence on intellectual capital, service innovation, and employee performance in the banking sector. The literature search was conducted using the Scopus database because of its comprehensive multidisciplinary coverage, rigorous journal indexing standards, and extensive citation information, making it one of the most widely used databases for business and management reviews. To ensure consistency and quality, only peer-reviewed journal articles published in English between 2010 and 2026 were included. Although relying on a single database may have excluded relevant studies indexed elsewhere, this limitation is acknowledged in the concluding section.

Three independent search strategies were employed using combinations of keywords related to (1) intellectual capital, (2) service innovation, and (3) employee performance, each combined with banking-related terms such as *bank*, *banking*, *financial institution*, and *financial services*. Searches were conducted within article titles, abstracts, and keywords to maximize retrieval of relevant studies while maintaining thematic alignment with the review objectives. The complete inclusion and exclusion criteria are summarized in Table 1.

Table 1. Selection Criteria

Inclusion Criteria	Exclusion Criteria
• Published between January 1, 2015, and July 7, 2026. • Peer-reviewed and full-text availability. • Article linking at least two relevant constructs in the banking/financial context. • Core: Intellectual capital, innovation, and performance. • Supporting: Intellectual capital and innovation, intellectual capital and performance, or innovation and employee/work performance. • Context: banking, financial institutions, financial services, fintech, insurance/takaful, and commercial/Islamic banking.	• Works not available in English. • Only one focal construct is explicit; the title/abstract is close or incomplete; full-text not available. • Non-peer-reviewed literature, such as conference proceedings, editorial notes, or book chapters, that lacks primary empirical data focused on the banking sector.

The review process consisted of four stages: identification, screening, eligibility assessment, and inclusion. Following the removal of duplicate records, titles and abstracts were screened against the predefined eligibility criteria. Potentially relevant studies then underwent full-text assessment to determine their suitability for inclusion. This systematic selection process ensured that only studies directly addressing intellectual capital, service innovation, and employee performance within banking were retained, while also incorporating relevant evidence relating to Generation Z employees.

The final sample comprised 36 peer-reviewed studies, which were synthesised using thematic analysis following the approach proposed by Braun and Clarke (2006). Information on study characteristics, research context, methodology, theoretical perspectives, and principal findings was extracted into a structured evidence matrix. Through iterative coding and constant comparison, recurring concepts were grouped into broader themes reflecting the relationships among intellectual capital, service innovation, and employee performance. These themes subsequently informed the development of the integrated conceptual framework and the identification of future research directions.

3.0 Findings and Discussion

The study selection process is summarized in the PRISMA 2020 flow diagram (Fig. 1). The initial search identified 32,067 records from the Scopus database. After removing duplicate records, 28,588 studies remained for title and abstract screening. Following the application of the predefined inclusion and exclusion criteria, potentially relevant articles underwent full-text assessment (Al-Ansi et al., 2024). Ultimately, 36 peer-reviewed studies met the eligibility criteria and were included in the final synthesis.

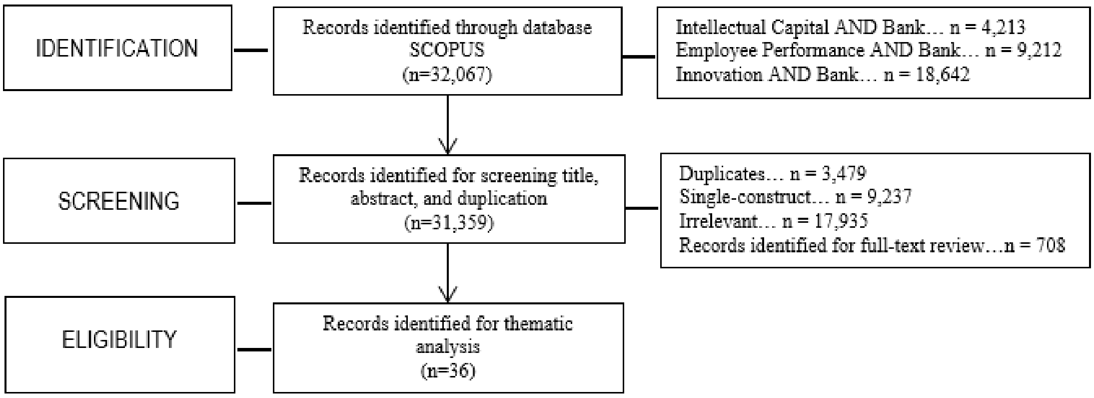

Fig. 1: PRISMA Flow Chart

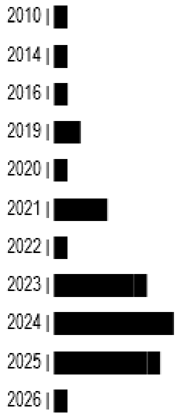

Fig. 2: Study Distribution by Year

Table 2. Distribution of Articles by Theme

Theme	References
Theme 1: Intellectual Capital as a Strategic Resource	• Abdallah et al. (2024); Asutay & Ubaidillah (2023); Githaiga (2020); Hariyati et al. (2019); Kuchciak & Warwas (2021); Malchev et al. (2024); Milošević et al. (2021); Mukaro et al. (2023); Pertiwi et al. (2024); Shih et al. (2010); Shome et al. (2023); Zafar & Yasin (2025); Zhang et al. (2026)
Theme 2: Intellectual Capital Drives Service Innovation	• Abubakr & Kalifa (2025); Al-Omoush & Alsmadi (2024); Chen et al. (2014); Klimontowicz & Majewska (2022); Mahayani & Darma (2025); Nguyễn & Trang (2025); Satryo et al. (2025); Shih et al. (2010); Thaib et al. (2025)
Theme 3: Service Innovation Improves Employee Performance	• Al-Husseini (2023); Almuayad et al. (2024); Chen et al. (2021); Hermawan et al. (2021); Islam et al. (2023); Li et al. (2024); Mahayani & Darma (2025); Tajeddini et al. (2019); Thaib et al. (2025)
Theme 4: Research Gaps and Generation Z	• Abdallah et al. (2024); Arifah (2024); Mahayani & Darma (2025); Masyhuri et al. (2024); Nguyễn & Trang (2025); Shah et al. (2024); Wattilete et al. (2025)

The included studies reflect growing scholarly interest in the relationships among intellectual capital, service innovation, and employee performance within the banking sector. Most were published between 2023 and 2025 (Fig. 2), indicating increased research attention following the acceleration of digital transformation in financial services. Geographically, the studies were conducted across diverse contexts, with a notable concentration in Asia, particularly Malaysia, Indonesia, and other emerging economies, reflecting the region's rapid banking digitalization and increasing emphasis on knowledge-based competitiveness.

Methodologically, the reviewed studies predominantly employed quantitative research designs, using survey data and structural equation modeling to examine relationships among intellectual capital, innovation capability, organisational performance, and employee outcomes. Although individual studies examined different constructs, the evidence consistently converged around four interrelated themes (Table 2) that explain how intellectual capital contributes to employee performance through service innovation. These themes form the basis of the following thematic synthesis (Akdeniz et al., 2023) and the integrated conceptual framework developed in this review.

3.1 Theme 1: Intellectual Capital as a Strategic Resource

Intellectual capital is widely recognized as a strategic organisational resource that enables banks to achieve sustainable competitive advantage by leveraging intangible assets, organisational knowledge, and human expertise. A systematic review by Abdallah et al. (2024) identifies intellectual capital as a key antecedent of organisational innovation and performance, while Zafar and Yasin (2025) demonstrate that its three interrelated dimensions—human, structural, and relational capital—operate synergistically to enhance institutional effectiveness and long-term competitiveness. Together, these studies position intellectual capital as the foundation of knowledge-driven banking organizations, where sustainable value creation increasingly depends on intangible rather than physical resources.

Among these dimensions, human capital represents the primary source of organisational capability through employees' knowledge, digital competencies, entrepreneurial skills, and problem-solving abilities, thereby improving operational efficiency and service quality (Malchev et al., 2024). Similarly, Githaiga (2020) found that investments in human capital strengthen employee competencies and support bank performance, while Asutay and Ubaidillah (2023) showed that intellectual capital enhances the financial performance of Islamic banks. In the Indonesian Islamic banking context, Pertiwi et al. (2024) further demonstrate that leadership and employee engagement strengthen human capital by encouraging knowledge sharing and service innovation.

Structural capital complements human capital by embedding individual expertise within organisational processes, information systems, and technological infrastructure. Effective knowledge management systems preserve organisational knowledge and support continuous learning (Shih et al., 2010), while management accounting systems and standardized processes improve organisational performance and operational effectiveness (Hariyati et al., 2019; Zhang et al., 2026). At the same time, relational capital strengthens organisational performance through collaborative relationships with customers, strategic partners, regulators, and other stakeholders, facilitating knowledge exchange, market responsiveness, and long-term competitiveness (Shome et al., 2023; Zhang et al., 2026). Consistent with this view, Mukaro et al. (2023) argue that strategically aligned stakeholder relationships reinforce organisational adaptability and competitive advantage.

Collectively, the evidence demonstrates that human, structural, and relational capital are mutually reinforcing resources that underpin organisational resilience, innovation capability, and superior performance. Banks that effectively integrate these dimensions are better positioned to transition from traditional asset-based competition to knowledge-driven strategic management (Kuchciak & Warwas, 2021). Consequently, intellectual capital should be viewed not merely as a collection of intangible assets but as a strategic capability that strengthens organisational performance and provides the foundation for service innovation (Milošević et al., 2021; Abdallah et al., 2024; Asutay & Ubaidillah, 2023).

3.2 Theme 2: Intellectual Capital Drives Service Innovation

Service innovation is the primary mechanism through which intellectual capital is transformed into organisational value, enabling banks to develop innovative financial products, enhance service delivery, and strengthen competitive advantage. Innovation capability enables organizations to convert human, structural, and relational capital into innovative services, while knowledge sharing facilitates the dissemination of expertise across organisational units to improve service quality and customer value (Abubakr & Kalifa, 2025). Complementing these capabilities, robust process capital—including standardized procedures, customer-oriented practices, and technological support—further strengthens service innovation by improving operational efficiency and supporting continuous improvement (Klimontowicz & Majewska, 2022).

Recent studies demonstrate that intellectual capital promotes service innovation through organisational learning, knowledge integration, and dynamic capabilities. Satryo et al. (2025) found that human, structural, and relational capital significantly enhance innovation performance in Indonesia's Islamic banking sector, with absorptive capacity acting as a key mediating mechanism. Similarly, Nguyễn and Trang (2025) reported that knowledge sharing strengthens innovation capability and banking performance by improving the use of organisational knowledge. Mahayani and Darma (2025) further showed that digital banking initiatives, supported by organisational learning and an innovation-oriented culture, enhance employee performance through continuous innovation, while Thaib et al. (2025) demonstrated that innovation and cross-functional collaboration enable banks to maximize internal resources and improve sustainable organisational performance. Collectively, these studies indicate that service innovation depends not only on technological investment but also on an organization's ability to integrate knowledge, foster collaboration, and build innovation capability.

These findings reinforce earlier evidence that the dimensions of intellectual capital operate synergistically to support innovation and organisational performance. Shih et al. (2010) argue that knowledge creation strengthens structural and relational capital through continuous organisational learning, whereas Chen et al. (2014) emphasize that integrating human expertise, organisational knowledge systems, and stakeholder relationships provides a sustainable source of competitive advantage in banking. The emergence of FinTech further strengthens this relationship by providing digital platforms through which intellectual capital is translated into innovative banking services. By aligning human, structural, and relational capital with digital technologies, banks enhance organisational agility and respond more effectively to evolving customer expectations (Al-Omoush & Alsmadi, 2024). Overall, the evidence identifies service innovation as the key mechanism linking intellectual capital with organisational value creation and improved employee performance, providing the foundation for the next theme.

3.3 Theme 3: Service Innovation Improves Employee Performance

Service innovation is the primary mechanism through which intellectual capital is translated into enhanced employee performance. The literature consistently identifies four interrelated pathways through which service innovation improves performance: productivity, service quality, innovative work behaviour, and knowledge utilization. By integrating advanced technologies, streamlined processes, and continuous learning opportunities, service innovation strengthens employees' ability to perform effectively in increasingly dynamic banking environments. These benefits are particularly relevant for Generation Z employees, whose digital proficiency, adaptability, and collaborative work preferences align well with innovation-oriented workplaces. Recent studies indicate that service innovation is most effective when embedded within broader organisational transformation initiatives. Mahayani and Darma (2025) found that digital banking, organisational learning, and an innovation-oriented culture collectively improve employee performance by strengthening employees' ability to adopt new technologies and enhance service delivery. Similarly, Thaib et al. (2025) showed that innovation and cross-functional collaboration enable employees to utilize organisational resources more effectively, improving operational capability and supporting sustainable organisational performance. Together, these findings suggest that service innovation creates value by fostering learning, collaboration, and capability development rather than through technology alone.

A consistent outcome of service innovation is improved employee productivity. Organizations leverage employees' creativity, expertise, and specialized knowledge to streamline work processes, reduce routine tasks, and improve customer interactions (Al-Husseini, 2023; Chahal & Bakshi, 2016). Likewise, Li et al. (2024) reported that digital transformation and FinTech innovation enhance productivity by increasing operational efficiency and optimizing the use of technological resources. Service innovation also improves service quality by enabling employees to deliver faster, more accurate, and customer-oriented financial services. These improvements contribute to higher customer satisfaction and stronger individual performance (Hermawan et al., 2021). Consistent with this, Chen et al. (2021) found that FinTech adoption enhances operational efficiency and service effectiveness, creating conditions that support superior employee performance. In addition, service innovation encourages innovative work behaviour by motivating employees to generate and implement new ideas in response to changing customer expectations and technological developments. This effect is particularly evident among Generation Z employees, whose openness to innovation and technology enables them to contribute more effectively to organisational innovation while enhancing their own performance (Islam et al., 2023).

Finally, effective knowledge utilization enables employees to access, share, and apply organisational knowledge, improving decision-making, adaptability, and continuous service improvement. These capabilities strengthen both individual performance and organisational adaptability in digital banking environments (Almuayad et al., 2024; Tajeddini et al., 2019). Overall, the evidence demonstrates that service innovation mediates the relationship between intellectual capital and employee performance by enhancing productivity, service quality, innovative work behaviour, and knowledge utilization. These findings reinforce service innovation as the critical organisational capability through which intellectual capital generates sustainable employee and organisational performance, particularly within Generation Z workforces.

3.4 Theme 4: Research Gaps and Generation Z

Generation Z has emerged as a key workforce cohort in the Malaysian and Indonesian banking sectors because of its digital competencies, adaptability, and technology-oriented work preferences (Masyhuri et al., 2024; Shah et al., 2024). Although research on intellectual capital, service innovation, and employee performance has expanded considerably, these constructs are still predominantly examined as separate research streams rather than within an integrated framework. In their systematic review, Abdallah et al. (2024) highlight the need for greater theoretical integration by explaining how intellectual capital generates organisational outcomes through contextual and mediating mechanisms. This reinforces the importance of examining service innovation as the mechanism linking intellectual capital to employee performance, particularly in digitally transforming banking environments.

Existing intellectual capital research has also paid limited attention to the distinctive characteristics of Generation Z employees despite their growing role in supporting digital transformation across Southeast Asian financial institutions (Wattilete et al., 2025). Current frameworks provide only limited insight into how digital-native employees' preferences for continuous learning, technological flexibility, collaboration, and meaningful work influence the relationship between intellectual capital, service innovation, and employee performance. Recent studies further indicate that organisational context shapes these relationships. Mahayani and Darma (2025) demonstrate that digital banking, organisational learning, and an innovation-oriented culture enhance employee performance, while Nguyễn and Trang (2025) show that knowledge sharing and governance mechanisms strengthen innovation capability and organisational performance. Likewise, Arifah (2024) argues that intellectual capital should be interpreted within its institutional and cultural context, demonstrating that Islamic work ethics influence organisational performance in Malaysian and Indonesian banking institutions. Together, these findings suggest that intellectual capital creates value through organisational mechanisms that facilitate learning, knowledge exchange, and innovation rather than functioning solely as a static organisational resource.

Although digital fluency generally supports service innovation and employee performance, it may also expose employees to technostress, continuous connectivity, and increasing work demands when organisational support is insufficient. Consequently, organisational well-being, supportive leadership, and learning-oriented cultures may strengthen the positive effects of digital competencies while reducing potential adverse outcomes. These contextual factors remain underexplored, particularly among Generation Z employees in digitally intensive banking environments. Overall, the evidence suggests that important research gaps remain regarding how intellectual capital, service innovation, organisational support, and Generation Z characteristics jointly influence employee performance. By synthesizing these fragmented research streams, this review provides an integrated foundation for future empirical studies within Southeast Asian banking (Costa et al., 2023; Wei & Yazid, 2026; Zahra et al., 2025).

4.0 Integrated Conceptual Framework

Drawing upon established intellectual capital frameworks (Jayathilake et al., 2021), this study develops an integrated conceptual framework through the systematic synthesis of existing literature (Fig.3). Rather than proposing an entirely new theory, the framework extends previous intellectual capital models by positioning service innovation as the key mechanism through which human, structural, and relational capital enhance employee performance within the digital transformation of the banking industry. It further contextualizes these relationships by incorporating the distinctive characteristics of Generation Z employees, whose digital competencies and evolving workplace expectations remain underrepresented in conventional intellectual capital research.

Fig. 3: Integrated Conceptual Framework

Consistent with established intellectual capital theory (Tathavadekar & Mahankale, 2025), the framework conceptualizes intellectual capital as the foundational organisational resource supporting service innovation. Human capital contributes employees' expertise, creativity, and problem-solving capabilities; structural capital provides organisational systems, processes, and technological infrastructure; and relational capital strengthens collaboration through internal and external stakeholder networks. Collectively, these dimensions foster an environment that enables continuous innovation and strengthens employee performance.

The framework synthesises the evidence presented in this review by illustrating how service innovation mediates the relationship between intellectual capital and employee performance while recognizing the influence of Generation Z's digital competencies, collaborative work preferences, and innovation-oriented expectations. Accordingly, it provides a contextual extension of existing intellectual capital theory and offers a focused foundation for future empirical research in Malaysian and Indonesian banking institutions undergoing digital transformation.

5.0 Conclusion

This systematic literature review demonstrates that intellectual capital enhances Generation Z employee performance primarily through service innovation, highlighting the strategic importance of human, structural, and relational capital in supporting organisational competitiveness within the banking sector (Rahmandika et al., 2025). The evidence further suggests that the benefits of digital transformation are maximized when supported by organisational well-being, psychologically safe workplaces, and ethical leadership that help mitigate technostress and sustain employee performance. Consequently, banking institutions should adopt integrated human resource strategies that combine intellectual capital development, service innovation, employee well-being, and Islamic work ethics to strengthen long-term organisational competitiveness in Southeast Asian banking (Arifah, 2024).

This review is subject to several limitations. The literature search was confined to the Scopus database, which may have excluded relevant studies indexed elsewhere despite its extensive coverage of high-quality journals. Furthermore, only English-language, peer-reviewed journal articles published between 2010 and 2026 were included. Future reviews should incorporate multiple databases and broader inclusion criteria to enhance the comprehensiveness and generalizability of the evidence. Future research should also examine how contextual factors—including organisational well-being, psychological safety, supportive leadership, burnout prevention, and institutional environments—shape the relationships among intellectual capital, service innovation, and Generation Z employee performance. Comparative studies between Malaysia and Indonesia would further enhance understanding of how organisational culture, regulatory environments, and Shariah-based governance influence these relationships (Arifah, 2024; Syarifuddin & Ilham, 2025).

Overall, this review provides an integrated synthesis of fragmented research by demonstrating that intellectual capital contributes to employee performance through service innovation while emphasizing the importance of supportive organisational environments for Generation Z employees. The proposed conceptual framework offers a stronger foundation for future empirical research and practical guidance for banking institutions undergoing digital transformation (Pertiwi et al., 2020).

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Paper Contribution to Related Field of Study

This systematic literature review advances the fields of intellectual capital, service innovation, and human resource management by providing an integrated synthesis of evidence on how intellectual capital enhances Generation Z employee performance through service innovation in the banking sector. Unlike previous studies that have primarily examined these constructs independently, this review consolidates fragmented findings into a coherent conceptual perspective, demonstrating that human, structural, and relational capital collectively drive employee performance by fostering service innovation. The study also extends existing intellectual capital literature by incorporating Generation Z as an important contextual factor, recognizing that this workforce cohort possesses distinctive digital competencies, collaborative work preferences, and innovation-oriented expectations that influence organisational outcomes. Furthermore, the review develops an integrated conceptual framework that positions service innovation as the mediating mechanism linking intellectual capital to employee performance, offering a refined theoretical foundation for future empirical research. From a practical perspective, the findings provide guidance for banking institutions, particularly in Malaysia and Indonesia, on aligning intellectual capital investments with innovation strategies, employee development, and supportive organisational practices to strengthen competitiveness in an increasingly digital environment. Overall, this review bridges theoretical and practical knowledge gaps while identifying promising directions for future research on knowledge-based competitive advantage in financial services.

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