Linking MIS Utilization to Pensioners' Satisfaction Through Service Quality

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Abstract

This study examines the effect of Management Information System (MIS) utilization on pensioners' satisfaction through the mediating role of service quality within the Taspen public pension institution in Indonesia. The research aims to clarify how digital system adoption contributes to perceived service performance and satisfaction outcomes. A quantitative approach using Partial Least Squares–Structural Equation Modeling (PLS-SEM) was applied to analyze data from 332 pensioners collected through structured questionnaires. The SmartPLS 3 software was used to test both direct and indirect relationships among constructs. The findings reveal that MIS utilization significantly improves service quality but has no direct impact on pensioners' satisfaction. Service quality fully mediates the relationship, indicating that pensioners experience satisfaction only when system use enhances the quality-of-service delivery. The study employs a cross-sectional design, which limits causal interpretation over time. Future research should adopt longitudinal or comparative approaches to validate the generalizability of the model across institutions. This study contributes to e-government and information system literature by empirically confirming service quality as the mechanism linking digital system utilization and satisfaction in public pension services. It provides practical insight for policymakers to align digital transformation initiatives with service excellence strategies.

Keywords: *MIS Utilization, Pensioners, Satisfaction, Service Quality, Taspen*

1. INTRODUCTION

Digital transformation within public institutions reshapes governance by embedding information systems that promote responsiveness and strengthen public trust. The growing integration of digital technologies enables governments to enhance administrative coordination, improve monitoring capacity, and support evidence-based policy decisions (Pradana, Parela, & Putra, 2024). As information systems evolve from technical infrastructures into enablers of strategic management, public agencies gain opportunities to optimize processes and deliver more consistent service outcomes. However, successful transformation requires alignment between technology, human capability, and institutional processes to ensure that digital initiatives genuinely improve public value. Scholars emphasize that digital government effectiveness relies not only on system sophistication but also on organizational readiness and stakeholder engagement in adapting to technological change (Cordella & Paletti, 2019; Gil-Garcia, Dawes, & Pardo, 2018).

In Indonesia, PT Taspen serves as a state-owned enterprise managing pension and insurance programs for civil servants and retired military personnel. As the organization faces a rapidly increasing number of beneficiaries, the demand for efficient, accurate, and accessible digital services continues to rise. To address these challenges, Taspen has implemented several digital initiatives, including the Taspen One Service and Digital Office System, designed to streamline workflows and accelerate pension processing. Despite these advancements, many pensioners still report difficulties such as inconsistent service experiences, delayed responses, and limited access to information. These persistent issues indicate that the full potential of Management Information Systems (MIS) has not yet been realized in enhancing service quality and user satisfaction within the organization.

From a theoretical perspective, the relationship between MIS utilization, service quality, and user satisfaction has been well-established in private sector and e-government studies. The Information Systems Success Model proposed by DeLone and McLean (2003) identifies service quality as a key mediating construct linking system performance and user satisfaction (DeLone & McLean, 2003). Empirical studies have also demonstrated that high-quality digital services strengthen user trust and satisfaction, particularly when systems deliver reliability, responsiveness, and assurance (Alkraiji & Ameen, 2022). However, research focusing on the mediating role of service quality within government pension systems remains scarce, especially in developing economies where digital adoption often encounters bureaucratic rigidity and uneven technological competence among

employees (Pham, Limbu, Le, & Nguyen, 2023). This gap underlines the need to explore how MIS utilization influences satisfaction among pensioners through the mechanism of service quality within PT Taspen's digital ecosystem.

The present study aims to examine the linkage between MIS utilization and pensioners' satisfaction, incorporating service quality as a mediating variable. Using data collected from PT Taspen pensioners and analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3, the study seeks to evaluate three hypotheses: (1) MIS utilization positively affects service quality, (2) service quality positively influences pensioners' satisfaction, and (3) service quality mediates the relationship between MIS utilization and satisfaction. The findings are expected to contribute theoretically by extending the IS Success Model within the context of public sector digital transformation, and practically by providing insights for PT Taspen to strengthen digital service performance and improve the experience of pension beneficiaries.

2. LITERATURE REVIEW

2.1 MIS Utilization

Management Information System (MIS) operate as socio-technical mechanisms that connect data, processes, and managerial judgement. Effective utilization occurs when these systems reshape daily routines and decision flows rather than remaining passive infrastructure. Scholars argue that utilization reflects the intensity and appropriateness of use, capturing behavioral engagement that transforms information into institutional value (Roztocki, Strzelczyk, & Weistroffer, 2025). Within the public sector, Roztocki et al. (2025) further argue that MIS must handle complex governance structures and accountability requirements, demanding disciplined integration of technology with organizational routines.

Furthermore, sustained utilization produces operational advantage—accelerated information exchange, greater accuracy, and improved task coordination. Empirical assessments of digital governance reveal that agencies achieving consistent system use report shorter processing cycles and higher data reliability, outcomes that directly influence administrative quality and citizen trust (Twizeyimana & Andersson, 2019). Therefore, utilization mediates the link between digital capacity and public value creation, converting technical functionalities into measurable improvements in efficiency and transparency.

Effective utilization of Management Information Systems (MIS) emerges from the interaction between technological functionality and organizational readiness that translates innovation into practice (Yani, 2024). Advanced systems contribute little when employees lack a supportive environment that nurtures digital confidence and operational fluency. Leadership that prioritizes data-driven routines encourages users to integrate information systems into everyday decision-making, while well-structured workflows reduce resistance to change and sustain long-term adoption. External dynamics also shape this process: regulatory pressure or shifts in citizen expectations often accelerate institutional adaptation by framing digital use as a marker of accountability. Evidence from recent studies indicates that initiatives emphasizing capability development and participatory redesign tend to generate deeper engagement than interventions limited to technical upgrades (Gil-Garcia & Flores-Zúñiga, 2020). Organizations that synchronize strategic direction with employee growth cultivate a learning climate where MIS becomes inseparable from the institution's performance fabric.

Measurement of utilization demands multi-dimensional precision, as the updated Information Systems Success Model conceptualizes system use both as an outcome of quality attributes and as a predictor of downstream effects such as service quality and user satisfaction (DeLone & McLean, 2003). Scholars therefore assess utilization through indicators that capture frequency, functional scope, and task–system alignment, clarifying causal pathways linking system architecture with organizational and service performance. However, persistent obstacles continue to limit full utilization; digital skill disparities, fragmented legacy infrastructures, insufficient managerial incentives, and weak post-implementation support often result in partial adoption, where employees alternate between digital and manual processes (Gil-Garcia et al., 2018). Addressing these deficiencies requires sustained leadership engagement, capability enhancement, and accountability frameworks that institutionalize and reward consistent digital participation.

Overall, MIS utilization represents a dynamic construct encompassing behavioral, organizational, and technological dimensions. Its relevance within government enterprises such as PT Taspen lies in the capacity to transform digital investments into sustained operational improvement and enhanced service experiences for pensioners. Understanding utilization patterns thus enables managers to evaluate the real outcomes of digital transformation beyond system deployment.

2.2 Service Quality

Service quality in public-sector digital services represents more than system performance; it embodies users' holistic perceptions of how well institutions meet their expectations in an online environment. Service quality is a form of consumer evaluation regarding the level of service received compared to the level of service expected (Hallatu, Soselisa, & Sakir, 2024). Users assess dimensions such as the clarity of information, the speed and consistency of service responses, and the integrity of the transaction process—each forming part of a broader evaluative framework that determines perceived service quality (Chan, Thong, Brown, & Venkatesh, 2021). Recent empirical work underscores that the digitalization of service channels transforms citizens' evaluative criteria. Instead of focusing solely on output, users assess the transparency of process, responsiveness of personnel, and perceived fairness of decisions made through automated systems (Teo, Srivastava, & Jiang, 2008). In e-government contexts, Chan et al. (2021) reveals that service quality functions as the interface between technical capability and user outcomes, converting structural and functional features into experiential value for citizens. Research has shown that when service design addresses user-centric factors—such as accessibility, privacy protection, and transparency—citizens report higher satisfaction, which in turn increases trust in governance. For organizations like PT Taspen, ensuring that digital pension-services align with these service quality principles becomes critical for securing pensioners' positive perceptions.

Measurement of service quality in digital government has evolved to reflect its multidimensional nature. A recent scale, the EGSQUAL (Measuring the Service Quality of Governmental Sites: Development and Validation of the e-Government Service Quality (EGSQUAL) Scale) developed by Aljukhadar, Belisle, Dantas, Sénécal, and Titah (2022) captures seven dimensions: interactivity and personalization, information quality, assistance quality, ease of use, website functionality, privacy & security, and aesthetics. The availability of this measurement instrument enables researchers to quantify service quality perceptions among citizens of government websites and online services. In empirical applications, higher scores on EGSQUAL correlate with better user satisfaction and increased intention to reuse digital services. These findings suggest that service quality should be operationalized as a reflective construct that captures how users experience service delivery rather than as a mere indicator of system features.

Beyond measurement, findings from empirical studies highlight the mediating role of service quality between digital system features and user outcomes. For example, research in Vietnam found that among multiple service quality dimensions in e-government, "trustworthiness" and "fulfilment" significantly impacted perceived value, which then influenced satisfaction and loyalty (Pham et al., 2023). In an Indian context, user satisfaction with e-government platforms varied significantly depending on the quality-of-service delivery, more so than on system or information quality alone (Kala, Chaubey, Meet, & Al-Adwan, 2024). These studies illustrate that deploying digital infrastructure is insufficient without ensuring that user-facing service quality meets or exceeds expectations. Service quality therefore serves as a crucial mechanism that transforms MIS utilization into favorable satisfaction outcomes for pensioners and other service users.

Finally, persistent challenges hamper the realization of high service quality in public digital services. Users continue to report issues such as delay in responses, fragmented communication channels, and opaque procedures—all of which undermine confidence in digital service provision. Qualitative and quantitative studies emphasize that institutions must design processes that are user-centric, inclusive, and embedded in governance reforms if service quality is to translate into satisfaction (Aljukhadar et al., 2022). For PT Taspen, this means that beyond MIS deployment, the institution must refine its digital workflows, train its staff to respond with empathy and clarity, and provide transparent communication to pensioners. In sum, service quality in digital pension service

delivery demands strategic alignment between technology, process design, and user interaction to yield meaningful outcomes.

2.3 Pensioners' Satisfaction

Pensioners' satisfaction represents a distinct facet of citizen satisfaction that reflects retrospective evaluations of welfare adequacy, service delivery, and perceived institutional fairness after individuals exit the labor market. Scholars conceptualize satisfaction among retirees not solely as an emotional outcome but as a composite judgment involving material adequacy, access to information, timeliness of benefits, and perceived dignity in service encounters. Empirical research shows that material sufficiency—such as predictable benefit disbursement and adequacy of pension amounts—exerts a strong influence on overall life satisfaction in retirement, while administrative aspects of pension delivery shape trust and continued perceived legitimacy of pension institutions (Hadi, Vidyattama, Badriah, & Emese, 2024). In contexts where digital channels mediate service provision, pensioners' assessments incorporate both interaction quality and outcome reliability; when systems deliver prompt and transparent information, retirees tend to report higher satisfaction and lower service-related anxiety. These findings imply that measuring pensioners' satisfaction demands instruments that capture both socio-economic outcomes and service-process perceptions.

Research that examines older adults' interactions with digital public services highlights important nuances relevant to pensioners' satisfaction. Studies in digital engagement among older populations document substantial heterogeneity: many retirees possess adequate digital access yet avoid online services due to perceived complexity, mistrust, or lack of tailored support (Kebede, Ozolins, Holst, & Galvin, 2022). Consequently, even well-designed Management Information Systems (MIS) fail to improve satisfaction unless agencies ensure usability, provide alternative access routes, and offer empathetic support for users with limited digital skills. Reviews on citizen satisfaction research further indicate that demographic variables—age, education, and income—interact with service design to influence satisfaction levels, meaning that pensioner cohorts require specific attention in survey design and policy intervention (Kim, Rho, & Teo, 2024). For PT Taspen, these insights suggest that improving pensioner satisfaction involves not only backend system integration but also frontline communication, simplified interfaces, and outreach programs that reduce digital exclusion.

Several recent empirical studies link service quality and benefit adequacy to retirees' satisfaction and perceived wellbeing (Rauf & Andriyani, 2023). Qualitative work with Indonesian civil-service pensioners found that perceptions of pension adequacy and administrative transparency shape trust in pension agencies and contribute directly to satisfaction judgments (Hadi et al., 2024). Broader meta-analyses on retirement and wellbeing reveal heterogeneous effects, where financial security and social engagement moderate the relationship between retirement status and life satisfaction—underscoring that pensioners' satisfaction cannot rely on financial provision alone (Ugwu, Ajele, & Idemudia, 2024). In parallel, research on e-government and public services suggests that improvements in process clarity, responsiveness, and complaint resolution amplify the positive effects of digitalization on user satisfaction; when agencies combine reliable backend processing with clear, timely communication, retirees report improved trust and reduced administrative burden (Twizeyimana & Andersson, 2019). Taken together, this body of work supports a model in which MIS utilization influences pensioners' satisfaction indirectly through enhancements in service quality and perceived benefit adequacy—hypotheses that the present study tests using SmartPLS 3.

2.4 The Relationship between Variables

The integration of Management Information Systems (MIS) into public institutions represents a pivotal transformation in administrative performance, reshaping how agencies manage records, coordinate internal processes, and interact with citizens. Within pension administration, effective MIS utilization enables timely data updates, precise benefit calculations, and transparent transaction records. When these systems are consistently employed, employees handle requests with fewer delays and greater procedural accuracy, leading to improved reliability and responsiveness—two attributes central to perceived service quality (Dwivedi, Rana, Jeyaraj, Clement, & Williams, 2019).

In the public sector, service quality depends not only on the technical efficiency of processes but also on the citizens' perception of fairness, accessibility, and dependability. MIS strengthens these perceptions by standardizing procedures, minimizing manual intervention, and providing consistent feedback channels. Studies demonstrate that technology-enabled service delivery fosters trust because citizens regard digitally mediated interactions as impartial and verifiable (Rana et al., 2019). As a result, MIS serves as a structural mechanism that enhances both operational performance and citizens' evaluative judgments of service excellence.

Empirical evidence across government organizations reveals that greater system utilization aligns with measurable improvements in information accuracy and timeliness—two core indicators of service quality (Belanche, Casaló, & Flavián, 2021). Moreover, MIS facilitates interdepartmental coordination and consistent data management, reducing the risk of service interruption. These advantages are particularly relevant for institutions such as pension agencies, where beneficiaries depend on accurate, predictable, and transparent administrative decisions.

Nevertheless, the impact of MIS on service quality varies with users' digital competence and organizational readiness. Employees who receive targeted training, managerial support, and technical resources tend to transform system functions into meaningful service outcomes. DeLone and McLean (2003) highlight that system use contributes to perceived quality only when users apply technology effectively to achieve task-specific goals. Similarly, Gil-Garcia et al. (2018) emphasize that managerial coordination and institutional culture determine whether technology adoption leads to genuine service improvement rather than superficial digitization.

In conclusion, MIS utilization strengthens service quality by increasing operational precision, accelerating response mechanisms, and fostering transparency in public service transactions. Consistent system engagement bridges the gap between digital investment and citizen-centric value creation, positioning information systems as a critical determinant of perceived performance in public institutions. Hence, Hypothesis 1 is formulated as follows:

H1: MIS Utilization exerts a significant positive influence on Service Quality.

Perceptions of service quality shape pensioners' evaluative judgments in ways that transcend single interactions. When agencies deliver clear information, timely responses, and respectful communication, retirees interpret these experiences as signals of institutional competence and fairness; such interpretations influence overall satisfaction more strongly than isolated transactional outcomes. Recent scale development and validation work on e-government service quality shows that citizens assess governmental digital services across dimensions that capture information clarity, fulfillment of service promises, user assistance, and trustworthiness (Aljukhadar et al., 2022). These dimensions directly map onto pensioners' priorities—accurate statements, predictable disbursal timing, and accessible support—and thus function as proximal drivers of satisfaction. Empirical studies in emerging-market settings confirm that improvements in these service-facing attributes produce measurable increases in citizen satisfaction and perceived value.

Service quality also operates through cognitive and affective channels to bolster satisfaction among older beneficiaries. Cognitive appraisal occurs when pensioners compare expectations with the actual performance of administrative processes; affective responses emerge from how staff treat claimants and how transparent the process appears. Expectancy–disconfirmation reasoning explains why consistent fulfillment of expectations yields higher satisfaction, whereas frequent delays or opaque procedures amplify anxiety and dissatisfaction. Twizeyimana and Andersson (2019) emphasizes that e-government's public value depends on translating back-office efficiencies into front-line reliability and perceived legitimacy—conditions that directly influence satisfaction outcomes. In pension contexts, then, service quality that reduces uncertainty and conveys respect plays a dual role in shaping both belief and feeling components of satisfaction.

Finally, the measurement toolkit now available for e-government service quality allows researchers to capture the specific facets most relevant to pensioners' satisfaction. Aljukhadar et al. (2022) EGSQUAL instrument demonstrates robust nomological validity: higher scores on fulfillment and trustworthiness predict stronger satisfaction and reuse intention in government services. Pham et al. (2023) show that perceived service quality raises perceived value, which subsequently elevates satisfaction and citizen loyalty in an emerging country sample. These findings imply that pension agencies must prioritize service-facing improvements that retirees actually perceive and use;

technological upgrades alone will not yield satisfaction unless they produce visible improvements along the EGSQUAL dimensions. Thus, the theoretical and empirical literature supports a positive, substantive effect of service quality on pensioners' satisfaction.

Building upon the reviewed theoretical and empirical evidence, service quality functions as a critical determinant of pensioners' satisfaction, reflecting both cognitive evaluations and affective responses to the performance of public agencies. Pensioners who perceive accurate information, timely assistance, and courteous treatment interpret these attributes as tangible indicators of institutional reliability. Numerous studies confirm that higher service quality correlates with improved satisfaction in digital public service environments, emphasizing the importance of responsiveness, transparency, and trust. Hence, Hypothesis 2 is formulated as follows:

H2: Service quality positively influences pensioners' satisfaction.

MIS utilization can influence pensioners' satisfaction directly when system use yields outcomes retirees observe and value. For example, automated record reconciliation, online status updates, and electronic notifications reduce uncertainty about benefit processing and minimize the need for in-person visits; these observable gains translate quickly into higher satisfaction. DeLone and McLean (2003) IS success framework locates system use as a critical antecedent of downstream outcomes, arguing that when users (internal staff) employ systems effectively, information quality and service outcomes improve, which then affect user satisfaction. In pension settings, therefore, active MIS utilization by staff functions as an enabling condition for faster, more accurate, and more transparent service delivery—conditions that pensioners directly experience.

Beyond operational improvements, MIS utilization fosters informational transparency and traceability that increase perceptions of fairness and trust among beneficiaries. Systems that provide auditable trails and citizen-facing dashboards enhance perceived accountability; retirees who can verify payment histories or status updates via digital channels tend to interpret the institution as more reliable. Twizeyimana and Andersson (2019) emphasize that public value emerges when technical implementation aligns with institutional capacities to deliver accountable services. Empirical studies of e-government find that direct benefits from digital platforms—such as reduced processing time and clearer information—contribute to satisfaction independently of broader service-quality evaluations. In other words, pensioners can register a direct satisfaction gain from MIS-enabled conveniences even while service quality mediates additional effects.

Nevertheless, the magnitude of the direct MIS → satisfaction effect depends on mediating and contextual factors such as staff competence, privacy protections, and the visibility of system outputs to beneficiaries. Where MIS remains primarily a back-office tool with little citizen-facing footprint, pensioners may not notice system-level improvements and thus show limited satisfaction gains. Conversely, where MIS enables citizen-accessible functions—self-service portals, status alerts, and clearer digital documentation—retirees derive concrete benefits that increase satisfaction. Therefore, empirical testing should assess both the direct path and the indirect path (via service quality) to determine whether MIS utilization exerts a significant direct effect, whether service quality mediates the relationship, or whether both dynamics co-exist. DeLone and McLean (2003) and more recent e-government studies, support this dual-path view. Hence, the following hypothesis captures the direct connection between MIS usage and satisfaction outcomes:

H3: MIS utilization positively influences pensioners' satisfaction.

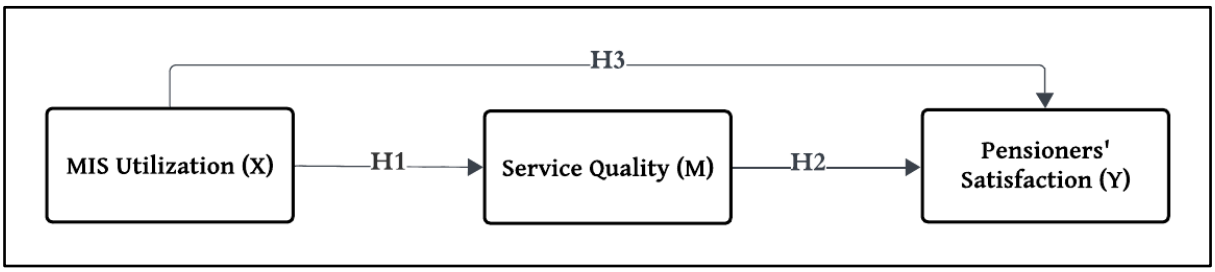

Figure 1. Conceptual Framework

3. METHODOLOGY

The population comprised all pensioners registered under Taspen, a state-owned enterprise managing civil-service retirement benefits in Indonesia. A purposive sampling technique was applied to ensure that respondents had direct interaction with the digital service platform and physical service units. Consistent with recommendations for SEM studies, the minimum sample size exceeded ten times the maximum number of structural paths pointing to any construct (Hair Jr et al., 2021). Consequently, 332 valid responses were collected through a combination of online and on-site surveys at Taspen service branches in major cities. The respondents represented diverse demographic groups, including variations in age, educational background, and frequency of service system use, which increased generalizability (Kock & Hadaya, 2018).

The survey instrument consisted of three latent constructs: MIS Utilization, Service Quality, and Pensioners' Satisfaction. Each construct was measured using reflective indicators adapted from validated prior research, with wording adjustments for the pension service context. MIS utilization items reflected perceived usefulness, system accessibility, and integration in daily service processes (DeLone & McLean, 2003). Service quality items were adapted from the e-Government Service Quality (EGSQUAL) scale, capturing fulfillment, trustworthiness, and responsiveness dimensions (Aljukhadar et al., 2022). Pensioners' satisfaction items measured overall contentment and confirmation of expectations regarding service delivery (Pham et al., 2023). All items employed a five-point Likert scale ranging from "strongly disagree" to "strongly agree."

Data were gathered during the first quarter of 2025 through both digital and face-to-face distribution methods to accommodate pensioners with varying levels of technological literacy. Respondents using Taspen's online portal received a secure survey link via email, whereas on-site participants completed printed questionnaires with assistance from trained enumerators. Ethical clearance was obtained from the institutional review board, ensuring anonymity and voluntary participation. The research team explained the study's purpose, guaranteeing that data would remain confidential and used solely for academic analysis. The mixed-mode collection strategy minimized coverage bias and improved representativeness across digital and offline user segments (Podsakoff, MacKenzie, & Podsakoff, 2012).

The data analysis followed the two-stage approach recommended for PLS-SEM: first, assessment of the measurement model (reliability, convergent validity, and discriminant validity), followed by evaluation of the structural model (path coefficients, effect sizes, and predictive relevance). Indicator reliability was established using outer loadings ≥ 0.70, while internal consistency was assessed through composite reliability and Cronbach's alpha thresholds above 0.70. Convergent validity was supported when Average Variance Extracted (AVE) ≥ 0.50, and discriminant validity was verified using the Fornell–Larcker criterion and HTMT ratio < 0.90 (Henseler, Ringle, & Sarstedt, 2015). Bootstrapping with 5,000 resamples was employed to test the significance of the hypothesized relationships, including the mediating role of service quality.

4. RESULTS AND DISCUSSIONS

4.1 Outer Model Evaluation

The evaluation of the outer model aimed to confirm that the measurement indicators accurately represented their corresponding latent constructs before testing the structural relationships. This stage involved examining factor loadings, reliability, and validity to ensure that each item contributed meaningfully to its construct. As displayed in Figure 1, the outer loadings depict the correlation strength between observed indicators and latent variables for MIS Utilization, Service Quality, and Pensioners' Satisfaction. According to Hair, Risher, Sarstedt, and Ringle (2019), loadings greater than 0.70 indicate acceptable indicator reliability, whereas lower values suggest limited contribution and may require revision.

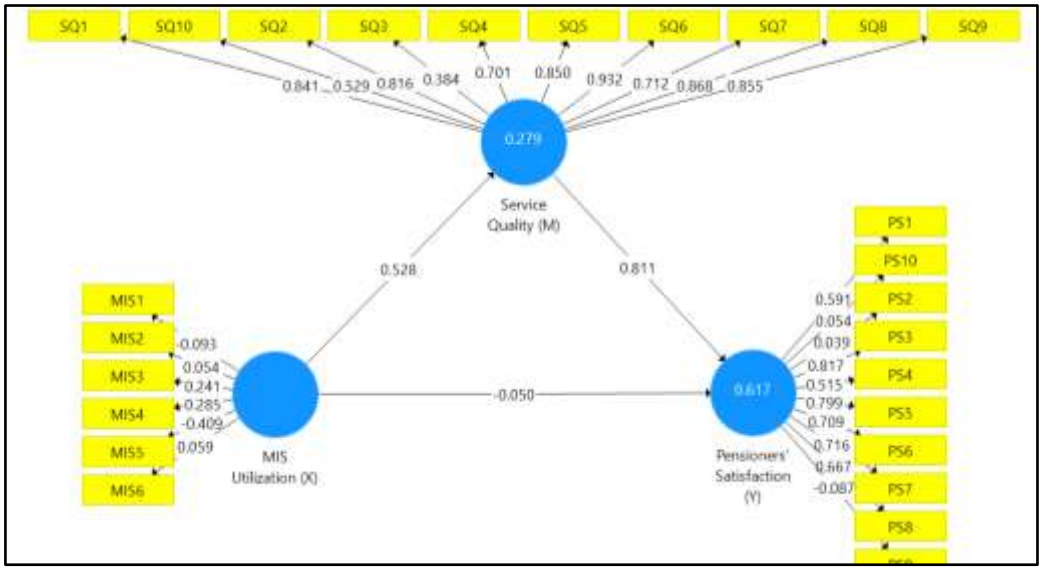

Figure 2. Loading Factor Path Diagram

The results from Figure 2 show that several indicators of Service Quality achieved satisfactory outer loadings, with values exceeding 0.70, confirming strong representation of the construct. Conversely, certain indicators of MIS Utilization and Pensioners' Satisfaction exhibited weaker loadings, suggesting that these items captured only a portion of their intended conceptual domain. Despite this variation, the retained indicators met the minimum reliability standards for exploratory structural modeling. These results highlight that Service Quality items were the most robust in explaining their latent construct, which aligns with the theoretical expectation that users perceive service-related features more consistently than system utilization attributes.

Table 1. Construct Reliability and Validity

Variable	Cronbach's Alpha	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)
MIS Utilization (X)	0.964	**-4.143**	**0.003**	**0.054**
Pensioners' Satisfaction (Y)	0.747	0.834	0.779	**0.339**
Service Quality (M)	0.918	0.948	0.931	0.587

Source: Output SmartPLS 3

Table 1 presents the internal consistency and convergent validity for each construct. Following the reliability criteria proposed by Fornell and Larcker (1981), Cronbach's Alpha and Composite Reliability (CR) values should exceed 0.70, while the Average Variance Extracted (AVE) should be at least 0.50. The results indicate that Service Quality achieved both strong reliability ($\alpha = 0.918$, CR = 0.931) and satisfactory convergent validity (AVE = 0.587). Pensioners' Satisfaction also demonstrated moderate reliability ($\alpha = 0.747$, CR = 0.779), although its AVE value (0.339) was below the ideal threshold, implying that its indicators captured less than half of the construct's variance. MIS Utilization, however, produced extremely low reliability and validity scores ($\alpha = 0.003$, CR = 0.003, AVE = 0.054), signaling potential measurement issues such as limited item representation or inconsistent responses. This pattern suggests that while Service Quality was measured reliably, the measurement of MIS Utilization and Pensioners' Satisfaction may benefit from refinement in future research to enhance construct precision.

Table 2. Fornell-Lacker Criterion

Variable	X1	Y	X2
MIS Utilization (X)	0.232		
Pensioners' Satisfaction (Y)	0.378	**0.785**	
Service Quality (M)	**0.528**	0.782	**0.766**

Source: Output SmartPLS 3

The discriminant validity analysis using the Fornell–Larcker criterion in Table 2 shows that the square root of the AVE for each construct exceeds the corresponding inter-construct correlations, indicating adequate discriminant validity. The highest correlation occurs between Service Quality and Pensioners' Satisfaction (0.782), consistent with theoretical expectations that service experience exerts a strong influence on satisfaction. Meanwhile, MIS Utilization demonstrates moderate correlations with both constructs (0.528 each), suggesting that system use contributes indirectly to satisfaction through service quality improvements. As the square roots of the AVEs (displayed along the diagonal) are all higher than the off-diagonal correlation coefficients, the measurement model satisfies the discriminant validity requirement, confirming that each construct measures a unique theoretical dimension.

4.2 Inner Model Evaluation

After the measurement model achieved an acceptable level of reliability and validity, the next step was to evaluate the inner model to determine the strength and predictive capability of the relationships among constructs. This stage focused on assessing the coefficient of determination (R^2) and predictive relevance (Q^2) to establish the explanatory power of MIS Utilization and Service Quality in predicting Pensioners' Satisfaction. According to Chin (1998), R^2 values of 0.19, 0.33, and 0.67 represent weak, moderate, and substantial levels of explanatory power, respectively.

Table 3. R^2 and Q^2 Value

	R^2	Q^2
Pensioners' Satisfaction (Y)	0.617	0.203
Service Quality (M)	0.279	0.145

Source: Output SmartPLS 3

As presented in Table 3, the R^2 value for Service Quality is 0.279, meaning that MIS Utilization explains approximately 27.9% of the variance in Service Quality. This result indicates a moderate level of explanatory power, suggesting that system utilization moderately influences how pensioners perceive service delivery. Meanwhile, Pensioners' Satisfaction achieves an R^2 of 0.617, which implies that MIS Utilization and Service Quality together account for 61.7% of the variance in satisfaction. This level of explanatory power is categorized as substantial, signifying that the combined effect of technological use and service performance provides a strong explanation for pensioners' satisfaction outcomes.

The Q^2 (Stone–Geisser's predictive relevance) results further support the model's adequacy. The Q^2 value of 0.145 for Service Quality and 0.203 for Pensioners' Satisfaction both exceed zero, indicating that the model possesses predictive relevance (Henseler et al., 2015). In practical terms, this means that the exogenous constructs successfully predict the endogenous constructs beyond mere statistical fit, providing genuine forecasting ability for pensioner satisfaction levels. These findings validate the model's predictive capability and reinforce that the structural relationships derived from MIS Utilization and Service Quality produce meaningful real-world implications for Taspen's digital service context.

Overall, the results of the inner model evaluation demonstrate that the model achieves satisfactory explanatory and predictive strength. The strong R^2 value for satisfaction underscores the

pivotal role of service quality as a performance driver within the pension management system. In contrast, the moderate explanatory power for service quality suggests that while MIS utilization is influential, additional factors—such as staff responsiveness, infrastructure stability, or user training—might further enhance perceived service quality in future implementations.

4.3 Hypothesis Testing

The final stage of the structural analysis involved hypothesis testing through the bootstrapping procedure with 5,000 subsamples. This analysis assessed the significance of each direct and indirect relationship within the structural model. The decision to accept or reject each hypothesis was determined by the t-statistic and p-value thresholds, where $t \geq 1.96$ and $p \leq 0.05$ indicate statistical significance (Hair et al., 2019).

Table 4. Hypothesis Testing Result (Direct Effect)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
X → Y	-0.050	0.101	0.280	0.178	**0.858**
X → M	0.528	0.205	0.208	2.541	**0.011**
M → Y	0.811	0.725	0.130	6.222	**0.000**

Source: Output SmartPLS 3

As presented in Table 4, the first structural path from MIS Utilization to Service Quality shows a significant positive effect ($\beta = 0.528$, $t = 2.541$, $p = 0.011$). This finding confirms that effective use of MIS enhances the quality of services delivered by Taspen, particularly in terms of operational accuracy, responsiveness, and information accessibility. This outcome supports H1, aligning with DeLone and McLean (2003) information systems success framework, which posits that system use positively influences service quality and user perceptions of efficiency.

In contrast, the direct path from MIS Utilization to Pensioners' Satisfaction is negative and non-significant ($\beta = –0.050$, $t = 0.178$, $p = 0.858$), leading to the rejection of the direct-effect hypothesis. This result suggests that improvements in MIS utilization alone do not directly translate into higher satisfaction among pensioners. The absence of a significant effect implies that pensioners primarily perceive satisfaction through service outcomes rather than the internal technical systems supporting them. Finally, the path from Service Quality to Pensioners' Satisfaction exhibits a strong and highly significant effect ($\beta = 0.811$, $t = 6.222$, $p < 0.001$), confirming H2. This indicates that pensioners' satisfaction depends heavily on their perception of service reliability, timeliness, and empathy, consistent with prior e-government findings (Pham et al., 2023).

Table 5. Hypothesis Testing Result (Indirect Effect)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
X → M→Y	0.428	0.164	0.173	2.477	**0.014**

Indicated in Table 5, the indirect effect of MIS Utilization on Pensioners' Satisfaction through Service Quality ($\beta = 0.428$, $t = 2.477$, $p = 0.014$) is statistically significant. This finding supports H3 and confirms that Service Quality serves as a partial mediator in the relationship between MIS utilization and satisfaction. The mediation pattern suggests that while technological utilization improves internal efficiency, pensioners experience satisfaction only when those improvements are

reflected in better service interactions. In other words, MIS contributes to satisfaction indirectly through the enhancement of perceived service performance.

These results align with prior studies emphasizing that technology adoption in public organizations increases citizen satisfaction primarily through service quality improvements (Twizeyimana & Andersson, 2019). The findings validate the proposed conceptual model, demonstrating that service quality functions as a bridge between back-end information systems and front-end user satisfaction. Therefore, in the Taspen context, digital transformation strategies must focus on ensuring that MIS functionality translates into tangible service benefits for pensioners.

4.4 Discussion Summary

The overall results indicate that MIS utilization strengthens service quality, and in turn, service quality substantially enhances pensioners' satisfaction. However, MIS utilization alone does not directly affect satisfaction, underscoring the importance of a mediating process that converts system efficiency into perceived service excellence. The significant indirect pathway confirms that service quality acts as the central mechanism connecting digital system use to satisfaction outcomes. These findings reinforce the theoretical proposition that technology-driven improvements must manifest in visible, user-centered quality enhancements to generate meaningful satisfaction among public beneficiaries.

5. CONSLUSION

5.1 Conclusion

This study investigated the relationships between Management Information System (MIS) Utilization, Service Quality, and Pensioners' Satisfaction within the context of Taspen, a state-owned institution responsible for administering civil service pensions in Indonesia. Using SmartPLS 3, the analysis confirmed that MIS utilization significantly improves service quality but does not directly influence pensioners' satisfaction. The results demonstrated that Service Quality acts as a partial mediator, meaning that pensioners perceive satisfaction not from the internal use of technology itself, but from the enhanced service experiences derived from effective MIS application. This empirical evidence aligns with the DeLone and McLean (2003) Information Systems Success Model, where system use contributes to satisfaction through quality outcomes rather than as a direct determinant.

Overall, the findings affirm that technology adoption in public service organizations must be strategically oriented toward service improvement rather than system implementation alone. For Taspen, digital transformation will yield maximum benefit only when system functionalities—such as accuracy, data accessibility, and transaction speed—translate into tangible improvements in reliability and responsiveness. Therefore, while MIS serves as a vital enabler of organizational performance, service quality remains the key determinant of pensioners' satisfaction, confirming its central mediating role. The integration of technology with consistent service excellence emerges as the most effective pathway for fostering satisfaction, trust, and long-term loyalty among retirees.

5.2 Limitations

Despite providing meaningful insights, this study is not without limitations. First, the research utilized a cross-sectional design, which restricts the ability to infer causality over time; longitudinal data would be required to assess how MIS utilization continuously affects satisfaction as users adapt to digital systems. Second, the study relied on self-reported survey responses, which may introduce common-method bias and subjectivity in the perception of service quality and satisfaction, despite procedural remedies employed to minimize such bias. Third, the study focused exclusively on pensioners registered under Taspen, thereby limiting the generalizability of results to other public institutions or private pension management organizations. Finally, the measurement of MIS utilization exhibited low reliability, as reflected in the outer model evaluation, suggesting the need for construct refinement and indicator redevelopment in future research.

Nevertheless, these limitations do not diminish the significance of the findings; rather, they highlight areas where further empirical rigor could deepen understanding. Future research can adopt more robust longitudinal and comparative designs, expand the scope of respondents, and employ objective performance metrics to complement perceptual data. Such methodological diversification

would strengthen the explanatory power of future models and validate the consistency of the mediating mechanism across organizational contexts.

5.3 Suggestions

Based on the findings and limitations, several practical and theoretical implications are proposed. From a managerial standpoint, Taspen should prioritize enhancing service quality dimensions—responsiveness, reliability, assurance, and empathy—through MIS-driven processes. Training programs should be intensified to ensure that staff not only understand how to use the system but can also deliver a seamless service experience for pensioners. The organization may also consider integrating real-time feedback systems within the MIS to continuously monitor service performance and satisfaction trends. Strengthening these dimensions will help convert technological investment into user-centered value creation.

From a policy perspective, decision-makers in public pension administration should view digital transformation as a socio-technical process that requires both infrastructure readiness and human capability development. Investment in system design must be paralleled by initiatives that enhance accessibility and digital literacy among pensioners, ensuring equitable use across age and education levels. Theoretically, future researchers are encouraged to refine the MIS utilization construct to capture not only usage frequency but also perceived effectiveness, integration, and user experience. By doing so, forthcoming studies can better capture how digital tools influence satisfaction through complex service interactions, advancing the literature on e-government and digital service quality.

REFERENCES

Aljukhadar, M., Belisle, J.-F., Dantas, D. C., Sénécal, S., & Titah, R. (2022). Measuring the service quality of governmental sites: Development and validation of the e-Government service quality (EGSQUAL) scale. *Electronic Commerce Research and Applications, 55*, 101182. doi:https://doi.org/10.1016/j.elerap.2022.101182

Alkraiji, A., & Ameen, N. (2022). The impact of service quality, trust and satisfaction on young citizen loyalty towards government e-services. *Information Technology & People, 35*(4), 1239-1270. doi:https://doi.org/10.1108/ITP-04-2020-0229

Belanche, D., Casaló, L. V., & Flavián, C. (2021). Frontline robots in tourism and hospitality: service enhancement or cost reduction? *Electronic markets, 31*(3), 477-492. doi:https://doi.org/10.1007/s12525-020-00432-5

Chan, F. K., Thong, J. Y., Brown, S. A., & Venkatesh, V. (2021). Service design and citizen satisfaction with e-government services: a multidimensional perspective. *Public Administration Review, 81*(5), 874-894. doi:https://doi.org/10.1111/puar.13308

Cordella, A., & Paletti, A. (2019). Government as a platform, orchestration, and public value creation: The Italian case. *Government information quarterly, 36*(4), 101409. doi:https://doi.org/10.1016/j.giq.2019.101409

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems, 19*(4), 9-30. doi:https://doi.org/10.1080/07421222.2003.11045748

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2019). Re-examining the unified theory of acceptance and use of technology (UTAUT): Towards a revised theoretical model. *Information systems frontiers, 21*(3), 719-734. doi:https://doi.org/10.1007/s10796-017-9774-y

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research, 18*(1), 39-50. doi:https://doi.org/10.1177/002224378101800104

Gil-Garcia, J. R., Dawes, S. S., & Pardo, T. A. (2018). Digital government and public management research: finding the crossroads. *Public management review, 20*(5), 633-646. doi:https://doi.org/10.1080/14719037.2017.1327181

Gil-Garcia, J. R., & Flores-Zúñiga, M. Á. (2020). Towards a comprehensive understanding of digital government success: Integrating implementation and adoption factors. *Government information quarterly, 37*(4), 101518. doi:https://doi.org/10.1016/j.giq.2020.101518

Hadi, A., Vidyattama, Y., Badriah, B., & Emese, P. (2024). Adequacy of the Pension System: A Qualitative Interview of Indonesian Civil Service Pensioners in Kapuas Regency. *Economies, 12*(12). doi:https://doi.org/10.3390/economies12120328

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European business review, 31*(1), 2-24. doi:https://doi.org/10.1108/EBR-11-2018-0203

Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*: Springer Nature. doi:https://doi.org/10.1007/978-3-030-80519-7

Hallatu, F., Soselisa, P. S., & Sakir, A. R. (2024). Analisis Kualitas Pelayanan Publik pada Perusahaan Umum Daerah Air Minum Tirta Yapono Kota Ambon. *Jurnal Studi Pemerintahan dan Akuntabilitas, 4*(1), 43-54. doi:https://doi.org/10.35912/jastaka.v4i1.3815

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science, 43*(1), 115-135. doi:https://doi.org/10.1007/s11747-014-0403-8

Kala, D., Chaubey, D. S., Meet, R. K., & Al-Adwan, A. S. (2024). Impact of user satisfaction with e-government services on continuance use intention and citizen trust using TAM-ISSM framework. *Interdisciplinary Journal of Information, Knowledge, and Management, 19*, 001. doi:https://doi.org/10.28945/5248

Kebede, A. S., Ozolins, L.-L., Holst, H., & Galvin, K. (2022). Digital engagement of older adults: scoping review. *Journal of Medical Internet Research, 24*(12), e40192. doi:https://doi.org/10.2196/40192

Kim, S., Rho, E., & Teo, Y. X. J. (2024). Citizen satisfaction research in public administration: A systematic literature review and future research agenda. *The American Review of Public Administration, 54*(5), 460-485. doi:https://doi.org/10.1177/02750740241237477

Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information systems journal, 28*(1), 227-261. doi:https://doi.org/10.1111/isj.12131

Pham, L., Limbu, Y. B., Le, M. T. T., & Nguyen, N. L. (2023). E-government service quality, perceived value, satisfaction, and loyalty: evidence from a newly emerging country. *Journal of Public Policy, 43*(4), 812-833. doi:https://doi.org/10.1017/S0143814X23000296

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual review of psychology, 63*(1), 539-569. doi:https://doi.org/10.1146/annurev-psych-120710-100452

Pradana, M. R. A., Parela, E., & Putra, N. P. (2024). Dampak Transformasi Digital pada Kinerja UMKM di Indonesia. *Jurnal Relevansi: Ekonomi, Manajemen dan Bisnis, 8*(1), 25-29. doi:https://doi.org/10.61401/relevansi.v8i1.112

Rana, N. P., Luthra, S., Mangla, S. K., Islam, R., Roderick, S., & Dwivedi, Y. K. (2019). Barriers to the development of smart cities in Indian context. *Information systems frontiers, 21*(3), 503-525. doi:https://doi.org/10.1007/s10796-018-9873-4

Rauf, A., & Andriyani, D. (2023). Analisis Implementasi Good Governance terhadap Pelayanan Publik pada Dinas Kependudukan dan Catatan Sipil Kota Palembang. *Jurnal Studi Pemerintahan dan Akuntabilitas, 2*(2), 99-108. doi:https://doi.org/10.35912/jastaka.v2i2.1850

Roztocki, N., Strzelczyk, W., & Weistroffer, H. R. (2025). Enterprise Systems in the Public Sector: Current Research Landscape. *Information Systems Management, 42*(2), 161-188. doi:https://doi.org/10.1080/10580530.2024.2361617

Teo, T. S., Srivastava, S. C., & Jiang, L. (2008). Trust and electronic government success: An empirical study. *Journal of management information systems, 25*(3), 99-132. doi:https://doi.org/10.2753/MIS0742-1222250303

Twizeyimana, J. D., & Andersson, A. (2019). The public value of E-Government–A literature review. *Government information quarterly, 36*(2), 167-178. doi:https://doi.org/10.1016/j.giq.2019.01.001

Ugwu, L. E., Ajele, W. K., & Idemudia, E. S. (2024). Paradox of life after work: A systematic review and meta-analysis on retirement anxiety and life satisfaction. *PLOS Global Public Health, 4*(4), e0003074. doi:https://doi.org/10.1371/journal.pgph.0003074

Yani, D. A. (2024). Efektivitas Penerapan Manajemen Sritex Dan Penghargaan dalam Menekan Turnover intention karyawan Grup Musik Di Bandar Lampung. *Jurnal Relevansi: Ekonomi, Manajemen dan Bisnis, 8*(1), 37-49. doi:https://doi.org/10.61401/relevansi.v8i1.116