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Factors Influencing Behavioral Intention to Use the System (MYIMMS) Among Immigration Officers

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Abstract: The low level of employees' behavioral intention to use digital systems has been the reason why many digital systems in the Malaysian public sector have failed. This misalignment is very important in frontline enforcement agencies such as the Malaysia Immigration Department. Technology uptake is affected by poor training, age diversity, and the complexity of interfaces, with a lack of knowledge on how these affect system acceptance. This article explores the relationship between perceived system complexity, age diversity, user attitude, and e-supervision on immigration officers' behavioral intention to use the MYIMMS system, drawing on the Technology Acceptance Model (TAM), UTAUT/UTAUT2, and Innovation Diffusion Theory (IDT). The study adopts a quantitative, cross-sectional survey design, using a structured questionnaire to collect primary data from immigration officers, to be analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM).

Keywords: *Behavioral Intention, Perceived System Complexity, Age Diversity, User Attitude, E-Supervision*

1. Introduction

Digitalization of public sector services has become a strategic priority for governments seeking to improve efficiency, transparency, and service quality. Technology-based supervision systems are increasingly deployed to monitor work processes, support supervisory functions, and enhance accountability within public organizations. However, successful implementation does not depend solely on technological availability; it also hinges on employees' behavioral intention to use the system. Even well-designed systems may fail to deliver expected benefits if employees perceive them as complex, misaligned with their attitudes, or poorly adapted to the demographic realities of the workforce.

Perceived system complexity is a key cognitive factor shaping employees' willingness to adopt new technologies. When users perceive an e-supervision system as difficult to understand or operate, they may feel overwhelmed and resist engaging with it in daily tasks, reducing confidence and increasing anxiety and thereby weakening behavioral intention. Systems perceived as user-friendly and intuitive, in contrast, are more likely to foster positive user experiences and sustained use.

Workforce characteristics such as age diversity also influence behavioral intention. Public organizations comprise employees from multiple age cohorts with different levels of digital literacy, work experience, and expectations toward technology. Younger employees may be more comfortable experimenting with new digital tools, whereas older employees may prefer established routines and require more structured support, shaping how different groups respond to the system's introduction.

Attitude toward the system is another crucial factor. Employees who view e-supervision positively — as beneficial, useful, and aligned with organizational goals are more likely to integrate it into their work practices. Conversely, if employees associate the system with increased surveillance, loss of autonomy, or added workload, they may develop negative attitudes that reduce their willingness to use it. These attitudes are shaped by prior experiences with technology, organizational culture, and how management communicates and implements the system.

Against this backdrop, the adoption of e-supervision within the Malaysia Immigration Department is a particularly relevant context. As a frontline agency responsible for border control, immigration services, and

enforcement, the department operates in a highly regulated, security-sensitive environment where effective supervision is critical. The e-supervision system MYIMMS aims to enhance monitoring, coordination and accountability across diverse units and locations. However, the department's workforce is characterized by varying technological readiness, age diversity, and prior experience with digital systems, which may influence how employees perceive the system's complexity, form attitudes toward its use, and ultimately decide whether to use it. Understanding these dynamics can inform more effective implementation strategies for digital supervision initiatives in the public sector.

The objective of this study is to examine how perceived complexity, age diversity, attitude, and e-supervision influence immigration officers' behavioral intention to use MYIMMS. Specifically, the study seeks: (RO1) to examine the relationship between perceived complexity and behavioral intention; (RO2) to examine the relationship between age diversity and behavioral intention; (RO3) to examine the relationship between attitude toward the system and behavioral intention; and (RO4) to examine the relationship between e-supervision and behavioral intention. These objectives are measurable with quantitative survey data using validated scales for each construct and can be tested simultaneously using structural equation modeling (SEM), ensuring alignment between the conceptual framework and methodology.

Background of Study

The increasing digitalization of public services has led governments worldwide to adopt electronic systems to enhance efficiency, transparency, and accountability, including in supervision and performance monitoring. Recent studies in public-sector digital transformation show that employees' behavioral intention to use such systems is a critical determinant of successful implementation, as even well-designed technologies may fail when users perceive them as difficult, misaligned with work practices, or unsupportive of their needs (Johari & Supiandi, 2025; Omer et al., 2022). Behavioral intention is commonly conceptualized as an individual's readiness or plan to use a system, which in turn predicts actual usage behavior (Davis, 1989; Venkatesh et al., 2003). Understanding its determinants is therefore essential to ensure investments in digital tools translate into sustained, effective use.

Perceived system complexity is one factor that can facilitate or hinder intention to use technology-based systems. Studies drawing on TAM and IDT indicate that when users view a system as complex or difficult to use, they form negative beliefs about its usefulness and ease of use, reducing intention to adopt it (Rogers, 2003; Liu et al., 2025). Empirical work in public and quasi-public organizations finds high perceived complexity associated with lower behavioral intention and actual use, particularly when training or support is limited (Nadeem et al., 2022; Liu et al., 2025). In e-supervision, complex interfaces and unclear procedures can increase cognitive load and anxiety, discouraging reliance on the system.

Age diversity within the workforce shapes how different cohorts approach technology adoption. Drawing on UTAUT, several studies highlight that age moderates the relationships between key determinants: effort expectancy, social influence, facilitating conditions and behavioral intention (Venkatesh et al., 2003; Ali et al., 2025). Evidence from Asian public-sector contexts suggests younger employees tend to be more open to experimenting with new systems, while older employees rely on established habits and require more targeted support, leading to generational gaps in adoption (Ali et al., 2025; Nadeem et al., 2022). These differences can influence peer norms and support related to e-supervision, affecting overall behavioral intention.

Attitude toward the system, conceptualized within TAM as a positive or negative evaluative feeling about using a technology, also plays a pivotal role. Employees' attitudes are influenced by perceived usefulness, ease of use, and habit, as repeated exposure to similar systems can strengthen or weaken favorable attitudes (Omer et al., 2022; Ali et al., 2025). In public-service settings, attitudes are further shaped by perceptions of surveillance, workload, fairness, and trust in management; when e-supervision is perceived as supportive rather than punitive, employees are more likely to develop positive attitudes and stronger intentions to use it (Johari & Supiandi, 2025; Omer et al., 2022).

E-supervision systems are increasingly viewed not only as monitoring tools but as platforms supporting learning, feedback, and professional development. When e-supervision integrates clear guidelines, structured training, and ongoing support, users report greater confidence and higher behavioral intention (Johari &

Supiandi, 2025; Nadeem et al., 2022). These benefits depend on alignment between system design, organizational culture, and user characteristics.

Despite growing research on technology acceptance in public-sector organizations, a notable gap remains in empirical studies on behavioral intention to use e-supervision systems within the Malaysian Immigration Department. Existing studies primarily examine general e-government services, HR information systems, or digital reporting platforms without specifically addressing perceived complexity, age diversity, attitude, and e-supervision in the immigration context (Johari & Supiandi, 2025; Omer et al., 2022; Ali et al., 2025), which is significant given the department's frontline role and diverse workforce.

The predictive validity of behavioral intention has been well established with regard to actual usage behavior. Thompson et al. (2025) found behavioral intention toward using artificial intelligence tools to be a significant predictor of actual use, and Park et al., (2025) reported that baseline behavioral intention strongly predicted actual e-commerce platform use across time periods. Ahmed et al. (2022) validated behavioral intention against actual adoption of IoT devices among 450 respondents tracked over 8 months, achieving 78% classification accuracy consistent across demographic groups. These findings are echoed by the meta-analytical work of Toraman & Gecit (2023) and corroborated by Singh et al. (2024), who found predictive validity coefficients consistently exceeding 0.65 in longitudinal technology adoption studies and confirmed that this predictive validity remains consistent across cultural contexts and technology types across 15 countries.

Practically, several factors undermine employees' behavioral intention to use e-supervision systems: perceived complexity from unintuitive interfaces (Nadeem et al., 2022; Liu et al., 2025); an age-diverse workforce responding unevenly to new systems (Ali et al., 2025); attitudes shaped by perceptions of usefulness, fairness, surveillance, and workload (Omer et al.,2022; Johari & Supiandi, 2025); and limited or inconsistent training (Nadeem et al., 2022). TAM, UTAUT, and IDT-based studies confirm ease of use, effort expectancy, and complexity as important predictors of behavioral intention in public-sector ICT initiatives (Venkatesh et al., 2003; Rogers, 2003), yet there is limited integration of these four factors within a single model in a high-stakes enforcement context. This gap underlies the core problem this study addresses: the lack of a comprehensive, empirically grounded understanding of the determinants of behavioral intention to use MYIMMS in this critical public agency (Omer et al.,2022; Johari & Supiandi, 2025; Ali et al., 2025).

2. Literature Review

Overview

This section reviews the literature relevant to the factors that influence immigration officers' behavioral intention to use the system in the Malaysia Immigration Department, discussing the major constructs, theories, and prior research explaining acceptance or rejection of a specific system: perceived system complexity, age diversity, attitude, e-supervision, and behavioral intention. The thematic review moves from general theoretical notions to specific evidence on the determinants of behavioral intention, supporting comparison across studies, identification of gaps, and development of the conceptual framework and hypotheses tested in this study.

Behavioral Intention to Use the System

Behavioral intention is widely defined as an individual's conscious decision or willingness to engage in a specific behavior in the future here, using a specific information system. In technology adoption research it is considered the immediate antecedent of actual use, expressed as a desire to use a technology shaped by positive attitudes, beliefs, and context (Venkatesh et al., 2003). Its significance rests on empirical evidence of reliability in predicting technology use: TAM intention variables explain behavioral intention more consistently than usage itself and intention remains a crucial construct for understanding users' decision-making (Dwivedi et al., 2023).

Empirical studies from 2022–2024 reinforce this role. Chen et al. (2022) found perceived usefulness, ease of use, and hedonic motivation significantly shaped intention to use media kiosks, which in turn predicted further use. Dwivedi et al. (2023) noted that understanding intention is crucial for organizations planning technology interventions, helping predict resistance or underutilization — although intention does not always predict

actual use where structural barriers exist. Accordingly, this study defines behavioral intention as immigration officers' self-reported willingness and plans to use MYIMMS in their daily work, evaluated through survey items on officers' plans to initiate, sustain, or expand their use of the system.

Perceived System Complexity

Perceived system complexity is the extent to which a user believes a system is complex to understand, learn, or operate. Complexity is regarded in the technology adoption literature as a negative attribute of an innovation, consistent with IDT's framing of complexity as affecting adoption rate and probability. Recent reviews highlight that perceptions of effort remain critical in shaping acceptance, especially when users must change existing work practices (Sánchez-Prieto et al., 2023), while public-sector transformation studies show legacy systems, resistance to change, and limited digital skills make new technologies harder to use, negatively affecting adoption outcomes (Rekunenko et al., 2025).

Empirical research from 2024–2026 remains consistent with this negative relationship. A 2024 study of digital technology adoption among innovative SMEs found complexity to have a negative effect on adoption intention (Awa et al., 2024). Rekunenko et al. (2025) found change resistance, legacy systems, and limited digital competence heighten practical complexity and hinder change implementation in government management, while a 2026 study of public-sector AI adoption in the Philippines found complexity continues to influence willingness to adopt technology after implementation (Abenes et al., 2026). These findings apply to immigration officers operating in a structured, high-responsibility environment; perceived complexity is treated here as a critical factor potentially eroding officers' behavioral intention to use MYIMMS.

Age Diversity

Age diversity refers to the presence of individuals across ages or generations within an organization, resulting in differences in experience, digital literacy, learning style, and attitudes toward technological change. Recent studies highlight age as a key factor shaping behavioral intention and actual adoption, not merely a background characteristic (Fazi & Zaniboni, 2025; Morris & Venkatesh, 2000). Younger workers are often more willing to experiment with digital tools, while older workers may prefer familiar processes and structured support; Fazi and Zaniboni (2025) found differences across performance expectancy, effort expectancy, social influence, facilitating conditions, and attitude by age, while Morris and Venkatesh (2000) found that attitude more strongly influences younger workers' adoption decisions, whereas subjective norms and perceived behavioral control more strongly affect older workers.

Literature from 2022–2026 confirms age-related technology readiness remains a significant adoption challenge. A study of older adults' willingness to use digital devices found that facilitating conditions, effort expectancy, and trust — not age alone — determine readiness (Li et al., 2024). Age diversity is particularly relevant to the Malaysia Immigration Department, whose officers have varying digital exposure and confidence with the system; generational differences may shape behavioral intention through varying levels of readiness, acceptance, and dependence on training or organizational support.

User Attitude

User attitude toward technology use is the global positive or negative judgment of using a specific technology, reflecting a cognitive evaluation of whether the system is beneficial, desirable, or burdensome, and serving as a psychological link between technology beliefs and intention to use (Yeng & Phillips, 2023; Miah et al., 2024). Employees develop positive attitudes and stronger intentions when a system is useful, manageable, and fits their jobs, but negative attitudes emerge when the system is associated with stress, over-monitoring, or disruption of routines. A study of public-sector managers' intention to use artificial intelligence found psychological and organizational perceptions significantly influenced intention (Al-Harbi et al., 2024), while studies of mandatory technology adoption found managers' behavioral intention is still influenced by attitude even when adoption is required (Rahman et al., 2024).

Empirical work from 2022–2026 corroborates attitude's impact on intention. Yeng and Phillips (2023) found behavioral factors significantly affected government employees' intention to use e-government services. Rahman et al. (2024) found managers' acceptance of a complex mandatory system was strongly linked to their perception of the technology in practice, and Al-Harbi et al. (2024) found public-sector managers' intention to

adopt AI systems was strongly influenced by human and organizational considerations. Attitude is particularly important for this study: officers who see MYIMMS as useful and supportive are expected to establish a positive attitude that increases behavioral intention, while officers who consider it intrusive or burdensome are expected to develop a negative attitude that reduces willingness to use it.

E-Supervision

E-supervision is the integration of digital technologies to aid supervisory duties such as monitoring work, giving feedback, recording performance, and communicating with employees. It extends beyond observation to developmental aspects such as coaching, learning support, and digital records management; recent literature situates e-supervision within the broader trend toward technology-based supervision that makes tasks more responsive, consistent, and accountable rather than merely watched (Taani et al., 2026; Sulaiman et al., 2024). Research on supervision in the digital age found digital platforms improved supervisory efficiency by supporting real-time feedback, collaboration, and professional development, framing digital supervision as growth rather than merely control (Sulaiman et al., 2024), while studies on electronic performance monitoring found developmental and preventive monitoring practices positively affected employee job performance when framed appropriately (Al-Harbi et al., 2024).

Conceptual and empirical work from 2022–2026 confirms e-supervision's importance in public-sector settings. Taani et al., (2026) described e-supervision as the application of online communication tools and digital platforms to facilitate continuous supervisory interaction. Sulaiman et al. (2024) found technology-based supervision increased supervisory job performance efficiency through communication and feedback loops, while Alharbi et al. (2025) showed electronic performance monitoring positively affects employee outcomes when it has developmental rather than punitive functions. This is especially significant for the department's MYIMMS system, which is designed to standardize monitoring, provide accurate records, and improve communication between officers and supervisors; officers' attitudes toward using it may hinge on whether it is perceived as guidance and performance support or as a negative monitoring tool.

Underpinning Theories

Three theories underpin this study: TAM, UTAUT/UTAUT2, and IDT. These remain widely used because they provide complementary explanations of system adoption — individual beliefs, social and organizational influences, and innovation characteristics — relevant to studies using behavioral intention as the dependent variable in organizational contexts (Alessandro, 2022; Rahman et al., 2024; Yang, Wang, & Liu et al., 2025).

TAM (Davis, 1989) explains user acceptance through two beliefs — perceived usefulness and perceived ease of use — which affect user attitude, which in turn affects behavioral intention and use behavior. Recent studies confirm perceived ease of use, usefulness, and attitude remain key predictors of intention to use work-related technologies (Vui et al., 2022). TAM was selected because perceived system complexity can be regarded as the opposite of ease of use, and attitude is explicitly incorporated as the psychological channel between complexity and behavioral intention.

UTAUT proposes that performance expectancy, effort expectancy, social influence, and facilitating conditions are key determinants of behavioral intention, while UTAUT2 adds hedonic motivation, price value, and habit; both recognize moderators such as age, gender, and experience, making them useful for examining technology adoption in age-diverse workforces (Rahman et al., 2024; Yang et al., 2023). This theory is suitable because age diversity is one of the independent variables; UTAUT/UTAUT2 explains why different age groups may react differently through effort expectancy, facilitating conditions, and habit.

Rogers' IDT examines characteristics of innovation relatively advantage, compatibility, complexity, trialability, and observability that affect adoption likelihood. Complexity is especially relevant since perceptions of complexity and usability influence technology adoption (Alessandro, 2022). IDT is appropriate here because perceived system complexity, one of the key explanatory variables is central to the theory.

Combined, TAM, UTAUT2, and IDT provide a solid theoretical base: TAM explains how perceptions and attitudes influence intention, UTAUT2 captures demographic variables such as age, and IDT explains how complex systems affect adoption decisions.

Empirical Review

Empirical studies from 2022–2026 confirm behavioral intention remains a key determinant in technology adoption, particularly in public-sector contexts where digital transformation success depends on users' willingness to adopt new systems, lending credence to the premise that individual perceptions, age differences, attitude, and supervisory practices can all affect immigration officers' intention to use an e-supervision system (Yeng & Phillips, 2023; Alatawi et al., 2022; Public First, 2026).

Perceptions of ease of use, effort expectancy and technological readiness significantly affect behavioral intention. Alatawi et al. (2022) found UTAUT factors and trust significantly affected both behavioral intention and e-government use behavior, while recent digital government studies found technology readiness, performance expectancy, and effort expectancy to be the most important predictors of public technology use (Abdullah et al., 2024). Yeng and Phillips (2023) demonstrated that government employees' behavioral intention to adopt e-government services is influenced by behavioral and contextual factors, while the Public Sector AI Adoption Index (Public First, 2026) found confidence, access, training, and leadership support to be powerful drivers of employee readiness. Even when employees recognize a system's value, however, lack of training and insufficient organizational support can limit widespread adoption (Abdullah et al., 2024; Public First, 2026). Relatively few empirical studies combine perceived complexity, age diversity, attitude, and e-supervision within a single model in a specialized enforcement environment; this study contributes to that gap by testing the influence of these four factors on immigration officers' behavioral intention to use the system.

Research Gap

Several gaps emerge from the literature. First, most research from 2022–2026 addresses e-government services, digital governance platforms, or citizen-facing technologies rather than internal supervisory tools used by employees of operational public agencies; Malaysian e-government adoption research has examined perceived usefulness, ease of use, and security but not e-supervision systems specific to immigration officers' work (Zubir & Abdul Latip, 2024), and broader public-sector technology adoption studies have not treated supervisory technologies as a distinct category (Frontiers, 2026). Second, prior research generally focuses on one or a small number of adoption variables rather than the combination examined here; most studies concentrate on perceived usefulness, trust, effort expectancy, or facilitating conditions without adequately addressing the interaction of perceived system complexity, age diversity, attitude, and e-supervision, with age diversity in particular rarely treated as an explanatory variable in its own right. Several recent Malaysian studies have found various factors affecting behavioral intention, but none have incorporated complexity, generational diversity, attitude, and e-supervision into a single model (Khan et al., 2026; Zubir & Abdul Latip, 2024).

Third, literature lacks attention to population and institutional context. Adoption studies generally focus on citizens, teachers, or government managers, with few examining immigration officers, who possess high accountability, procedural discipline, and security sensitivity. Recent smart-government research confirms the significant role of institutional determinants in officials' technology adoption but cautions that results cannot be generalized across organizations with different roles and tasks — a significant knowledge gap for the Malaysia Immigration Department. This study addresses that gap by investigating the interaction between perceived system complexity, age diversity, attitude, and e-supervision on immigration officers' behavioral intention, responding to the context-specific research called for by recent scholarship (Khan et al., 2026; Zubir & Abdul Latip, 2024).

Hypotheses Development

This study proposes a model in which perceived system complexity, age diversity, attitude, and e-supervision serve as independent variables, with behavioral intention as the dependent variable, grounded in TAM, UTAUT2, and IDT (Fazi & Zaniboni, 2025; Shareef et al., 2024; Huang et al., 2023).

Perceived system complexity is predicted to negatively affect behavioral intention. Based on IDT, technologies that are difficult to understand, learn, or operate are less likely to be adopted, as they involve more effort, uncertainty, and risk (Shareef et al., 2024).

H1: *There is a significant relationship between perceived system complexity and the behavioral intention to use MYIMMS among immigration officers. H0: There is no significant relationship between perceived system*

complexity and the behavioral intention to use MYIMMS among immigration officers.
Age diversity may affect behavioral intention because employees from different age groups have different technology readiness, effort expectations, learning preferences, and work habits (Fazi & Zaniboni, 2025).
H2: *There is a significant relationship between age diversity and the behavioral intention to use MYIMMS among immigration officers. H0: There is no significant relationship between age diversity and the behavioral intention to use MYIMMS among immigration officers.*

User attitude is expected to have a positive relationship with behavioral intention. TAM proposes that positive attitudes toward a system lead to higher intention to use it, and Huang et al. (2023) found user attitude played a crucial role in intention to join a technology-mediated work arrangement.
H3: *There is a significant relationship between attitude toward the system and behavioral intention to use MYIMMS among immigration officers. H0: There is no significant relationship between attitude toward the system and the behavioral intention to use MYIMMS among immigration officers.*

E-supervision is expected to have a positive relationship with behavioral intention, since supportive supervisory technologies can improve communication, monitoring clarity, and learning opportunities (Shareef et al., 2024; Fazi & Zaniboni, 2025).
H4: *There is a significant relationship between e-supervision and the behavioral intention to use MYIMMS among immigration officers. H0: There is no significant relationship between e-supervision and the behavioral intention to use MYIMMS among immigration officers.*

3. Conceptual Framework

The conceptual framework positions perceived system complexity, age diversity, attitude, and e-supervision as independent variables, with behavioral intention as the dependent variable, built on TAM, UTAUT/UTAUT2, and IDT — indicating that technology adoption is a function of user perceptions, demographic differences, evaluative attitudes, and contextual support mechanisms (Fazi & Zaniboni, 2025; Uzochukwu & Nwoye, 2026; Adewale & Ndwandwe, 2025). Perceived system complexity is hypothesized to negatively affect behavioral intention, consistent with IDT's premise that hard-to-understand technologies are less accepted. Age diversity is included on the assumption that readiness, confidence, adaptability, and technology expectations differ across age groups, affecting how easily officers adjust to the system (Fazi & Zaniboni, 2025).

Attitude is hypothesized to relate positively to behavioral intention, consistent with TAM's contention that positive attitudes increase intention to use technology. E-supervision — the use of the digital system to supervise, monitor, coordinate, provide feedback, and support work-related issues — is also expected to positively affect behavioral intention, as technology is more readily accepted when seen as improving supervisory processes; studies in supervisory and educational e-supervision settings have found acceptance is influenced by perceived usefulness and enabling conditions (Adewale & Ndwandwe, 2025), while research on supervisory agencies suggests institutional support, training, and facilitating conditions play a positive role in technology-related outcomes (Uzochukwu & Nwoye, 2026).

Overall, the framework conveys that behavioral intention to use the system is shaped jointly by technological, demographic, psychological, and supervisory factors, forming a unified foundation for the four hypotheses tested with quantitative data collected from immigration officers of the Malaysia Immigration Department.

4. Methodology

Introduction and Rationale
Research methodology offers a structured system to examine phenomena, test hypotheses, and generate dependable knowledge. Research is a sequence of planned and executed steps aimed at answering a problem of interest to the researcher (Sekaran, 2003), while research design is "a blueprint or plan for the collection, measurement and analysis of data" developed to answer the research questions (Sekaran & Bougie, 2016). Quantitative survey methods, particularly with structural equation modeling, are recognized in methodological literature from 2022–2026 as suitable for studying relationships among latent constructs such as perceived usefulness, complexity, attitude, and behavioral intention, and for drawing generalizable conclusions in public-

sector environments (RMIT University Library, 2019; Taherdoost & Madanchian, 2023). This reflects the rationale for the present study, which applies a structured questionnaire and SEM-based analysis to test relationships among perceived system complexity, age diversity, attitude, e-supervision, and behavioral intention, aligned with recent studies using structured questionnaires and PLS-SEM (Awa et al., 2024; Musa et al., 2025).

Research Design

Following Sekaran (2003), research design decisions rest on six interdependent elements. In terms of purpose, this study combines a descriptive and hypothesis-testing design: descriptive elements profile the characteristics of immigration officers, while hypothesis testing follows a deductive approach to statistically validate propositions derived from TAM, UTAUT, and IDT. The study adopts a correlational design rather than a causal one, consistent with the prevailing approach in organizational and management research where variables cannot ethically or practically be manipulated (Sekaran, 2003; Creswell, 2014).

This study involves minimal researcher interference, as data are gathered from respondents completing questionnaires without manipulation of their natural work environment. The study setting is non-contrived (field), since data collection occurs within the natural environment of the Malaysia Immigration Department. The unit of analysis is the individual employee; although several constructs are organizational in nature, they are operationalized and measured based on individual employees' perceptions, and each respondent represents one unit of analysis. The time horizon is cross-sectional: data are collected once, providing a snapshot of conditions at a given point — the most convenient and economical design for thesis research given time and resource constraints (Sekaran, 2003).

Population, Sample and Sampling Technique

The population comprises all employees from six divisions of the Malaysia Immigration Department — Passport, Visa and Pass, Foreign Worker, Corporate, Enforcement, and Controller, totaling 150 employees (25, 15, 15, 15, 35, and 45 respectively). Based on the Krejcie and Morgan (1970) table for determining sample size, a population of 150 requires a sample size of 108. Using proportionate stratified sampling, the 108 respondents are allocated as 19, 10, 10, 10, 27, and 32 across the same six divisions, respectively.

The sampling technique adopted is probability sampling, specifically proportionate stratified random sampling, in which the total population is divided into strata before sampling. This method is appropriate for a large population of defined size, allowing every element a known, non-zero chance of selection and enabling generalization of findings to the broader population.

Data Collection Method and Instrument

Primary data, raw information obtained first-hand by the researcher (Sekaran & Bougie, 2016) , will be collected using a structured questionnaire comprising six sections. Section A captures demographic background: gender, age, education level, years of service, current position, division/unit, and frequency of system use. Sections B through F each measure one construct using 13 items per section, answered on a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree) (Likert, 1932): Section B measures Perceived System Complexity, Section C measures Age Diversity, Section D measures User Attitude, Section E measures E-Supervision, and Section F measures the dependent variable, Behavioral Intention. Item development draws on established sources aligned with the literature review: Rogers (2003), Moore and Benbasat (1991), and Overbye-Thompson and Hamilton (2025) for perceived complexity; Morris and Venkatesh (2000) and the Central Baltic Program (2023) for age diversity; Davis (1989) and Peng et al. (2022) for user attitude; Venkatesh et al. (2003) and Li et al. (2026) for e-supervision and UTAUT2, Mensah and Khan (2024), for behavioral intention.

Following Sekaran's (2003) guidelines, the instrument emphasizes clarity, avoidance of leading or ambiguous questions, logical sequencing, and protection of respondent anonymity. The Likert scale operates at the interval level, permitting calculation of means and standard deviations, and remains the most widely used scale in management and social science research.

5. Pre-Test, Pilot Test and Validity

The study begins with a pre-test to identify concerns such as ambiguous wording, followed by a pilot study to ensure items are sensitive to respondents' language and culture, particularly for attitudinal measures (Sekaran & Bougie, 2016). The pilot test was conducted with 50 respondents from the banking industry, with data analyzed using SPSS Version 27 to assess Cronbach's Alpha for each construct's 13 items across the four independent variables and the dependent variable. Following George and Mallery (2016), a Cronbach's Alpha closer to 1.00 indicates greater internal consistency, with an acceptable reliability threshold of 0.70; all items in the pilot test were found reliable and suitable for further field data collection.

Validity — the ability of a measuring instrument to measure what it is intended to measure, was assessed with the assistance of a subject-matter expert, the study's supervisor, to ensure questionnaire quality and accuracy (Sekaran & Bougie, 2016; Creswell, 2014). At the full data-collection stage, the measurement model will also be assessed through Cronbach's alpha, composite reliability, convergent validity (average variance extracted), and discriminant validity (HTMT), ensuring each construct is measured consistently with the conceptual framework.

Data Analysis

Data analysis is the process of interrogating, transforming, and modelling data to highlight useful information and support decision-making. This study analyses quantitative data using IBM SPSS Version 27 for frequency, reliability, and descriptive analysis, with each item coded prior to statistical treatment. Frequency analysis provides counts, percentages, and measures of central tendency and dispersion for demographic data. Reliability analysis, via Cronbach's Alpha, determines internal consistency of the instrument; the generally accepted threshold is $\alpha \geq 0.70$, with 0.80 and above considered good and 0.90 and above excellent (Sekaran & Bougie, 2003). Descriptive analysis reports the maximum, minimum, mean, standard deviation and variance to accurately depict respondents ' responses.

Correlation analysis determines the strength of relationships between the independent and dependent variables, interpreted using conventional thresholds ranging from little or no correlation (0.00–0.30) to very high positive correlation (0.90–1.00) (Sekaran & Bougie, 2003). Regression analysis, and ultimately Partial Least Squares Structural Equation Modeling (PLS-SEM), will estimate the relationships between the four independent variables and behavioral intentions, assessing the strength and direction of these effects in testing H1 through H4.

Ethical Considerations

Ethical approval will be sought from UiTM prior to data collection, focusing on informed consent, confidentiality, voluntary participation, and data protection. An information sheet will explain the study's purpose, what participation involves, its voluntary nature, and confidentiality measures. Consent is operationalized through the survey process, whereby submission of the completed questionnaire is treated as evidence of informed consent. No personally identifiable information will be collected; responses will be processed using numerical codes, and participation is voluntary, with respondents free to withdraw at any time without penalty. Electronic data will be stored in a password-protected file accessible only to the research team, while physical data will be kept in secure storage and destroyed in a manner consistent with institutional standards.

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