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Roles and Functions of Central Government Accounting Authority in Advanced Economies: Reflections for Malaysia

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Abstract

Purpose: The current study sought to benchmark the core functions and roles played by the Malaysian Accountant General's Department (AGD) against comparable entities in selected jurisdictions.

Methods: A comparative documentary analysis was conducted, with Singapore, New Zealand, and Canada employed as benchmarks, owing to the three (3) countries having well-established public financial management systems. Accordingly, government documents, speeches, websites, and other publicly available information were analysed to determine the strategic and operational functions of these entities, as well as their institutional structures and initiatives.

Findings: The central government accounting authorities in this study performed both operational and strategic accounting functions, with Singapore, Canada, and New Zealand extending existing operational roles to broader strategic financial management functions, which were associated with stronger mandates and authority, accounting basis, digital reformations, and more holistic capability-building initiatives. Furthermore, the strategic role played by the AGD in Singapore was strengthened through digital innovation, despite maintaining a cash-based accounting system, compared to Canada and New Zealand, which used accrual-based accounting. Although the AGD in Malaysia performed both operational and strategic functions, its strategic role needs to be further enhanced.

Limitations: This study represented an exploratory study limited to a documentary review of publicly available information. More in-depth insights could be obtained through interviews, surveys, and wider international benchmarking.

Originality: This study addresses the current gap in the existing literature by examining how the institutional structures and initiatives could support the strategic and operational functions of central government accounting authorities.

Keywords: Central Government Accounting Authority, public sector accounting, Malaysia, Accountant General's Department

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1.0 Introduction

Central government accounting authorities (CGAAs), through their role in financial reporting and management, enable the optimal use of public resources (ACCA, n.d.). The challenging and uncertain environment requires CGAAs to play a more profound role, particularly in supporting the development of more robust financial policies and effective public financial management to achieve the objectives of fiscal sustainability and discipline. In Malaysia, the AGD serve as the chief accounting authority of the government, with its key responsibilities related to preparing the financial statements of the federal government, managing public funds, performing the oversight of public resources, and strengthening capacity through accounting consultancy, service management, and training programmes. The Malaysian AGD has also embarked on various programmes and initiatives to modernise public-sector accounting and financial management. However, the changing environment, rapid technological advancements, and the need to remain relevant and responsive to diverse stakeholder groups necessitate the transformation of the AGD's roles and functions.

Thus, it is important to determine the insights related to the roles and functions of CGAAs that are relevant and practical in the Malaysian context. Benchmarking the Malaysian AGD against other CGAAs will help to identify potential areas of improvement. Most of the literature on public-sector accounting or public financial management does not explicitly examine the strategic and operational roles of CGAAs and their institutional structures and initiatives. Most of the scholars have mainly focused on accounting reformations, specifically the transition to accrual accounting or relevant outcomes, the changing role of accountants, or issues related to accountability. Moreover, there has been a limited comparative analysis of the reasons that certain CGAAs have wider, or more expanded strategic roles compared to other CGAAs. As such, in this study, the main objective was to acquire deeper perspectives from comparable entities in three (3) selected countries, namely Singapore, Canada, and New Zealand, to determine their respective roles and functions and the associated institutional structures and initiatives. The rationales for selecting the three (3) countries were due to the presence of well-established systems for public-sector financial management. The benchmarking undertaken will be used to provide recommendations for strengthening the role and functions of the Malaysian AGD.

2.0 Literature Review

2.1 The Objectives of Accounting

Public-sector entities often operate in an environment that is mainly characterised by distinct risks, objectives, and institutional pressures, which are profoundly different from those of private-sector organisations, thereby shaping the unique purposes and objectives of governmental accounting, as well as the roles and functions of accountants (IFAC, 2020; Tregear & Jenkins, 2007). Tregear and Jenkins (2007) identified several key characteristics that distinguished public-sector organisations from their private sector counterparts, wherein the main objective of private-sector organisations is profit maximisation, whereas the key objectives of public-sector organisations are to serve the public interest and create public value. Thus, the success of public-sector organisations is generally measured by the ability to achieve social outcomes rather than profitability (Tregear & Jenkins, 2007; Siti-Nabiha et al., 2024). Specifically, for key government agencies, the above objectives frequently translate into the delivery of public policies or policy advice as their primary output (Tregear & Jenkins, 2007), hence necessitating a specific approach to governmental accounting. Particularly, Chan (2003, p. 14) argued that governmental accounting serves multiple objectives, in which, at the most basic level, it aims to safeguard public resources by preventing and detecting fraud and corruption, whereas at an intermediate level, it seeks to improve the effectiveness and efficiency of financial management within the public sector. Ultimately, at its most advanced level, governmental accounting can support the duty of the government to guarantee satisfactory degrees of accountability and transparency for relevant financial decisions and actions.

To fulfil the advanced role of governmental accounting, Chan (2003, p.18) contended that only maintaining accurate records will not be sufficient, as actual transparency necessitates financial information to be made publicly accessible and presented in a manner that is understandable to the general public, who may not have the necessary technical capacity or time to interpret detailed financial statements. Furthermore, Chan (2003) emphasised that fiscal accountability extends beyond traditional year-end reports. Fiscal accountability requires the inclusion of budget-to-actual comparisons within financial statements to enable more meaningful performance evaluation as Chan (2003, p.18) states:

> "it is not enough to keep the books accurately; the books have to be open to the public. When the public does not have the time or ability to inspect the accounts, governments have to make the task easier by preparing comprehensible—as well as comprehensive—financial statements."

Hence, the role played by the CGAAs should not be limited to operational functions, but rather should also encompass strategic roles to achieve the key purposes of governmental accounting as identified by Chan (2003), which include safeguarding public funds, providing a credible assessment of the financial position of the government, enhancing the effectiveness of financial management, and reinforcing transparency and accountability in the public sector.

2.2 Strategic and Operational Role of Accountants

There is recognition that strategy and policy formulation in the public sector should be undertaken collaboratively, which involves the sharing of skills, expertise, and resources with both internal and external parties (Favoreu et al., 2016). Strategic management accounting can be utilised in strategic development, implementation, and renewal, and is therefore related to planning and control (Höglund et al., 2021). Hence, accountants could play a key role in the development and evaluation of public policies and strategies, thus becoming strategic partners to decision makes (ICAEW, 2018). This strategic role is fulfilled through providing insights the financial implications of government policies and programmes and aligning financial plans with the main goals of public policies to achieve fiscal sustainability, promote efficiency, accountability, and transparency in the utilisation of public resources. In contrast to the longer-term perspective of strategic roles, the operational role focuses on short-term and routine tasks relating to transactions and compliance with regulations, including managing financial transactions, financial reporting, internal control, and routine activities such as the preparation of statutory and internal reports and the management of systems, such as payroll and procurement.

The resource constraints and unique nature of the public sector require the transformation of public-sector accounting to provide relevant financial advice that can more effectively support the diverse and often competing priorities of the government (ACCA, 2022). Existing empirical research has indicated that reformations in public-sector accounting, such as the use of accrual accounting, increasing demands for transparency and accountability, and the adoption of digital technology, have led to the merging of the strategic and operational roles of accountants. As a result, the role of accountants has broadened, which has contributed more value to organisations, especially as existing roles have become more professional and evolved from transaction-oriented record-keeping functions to strategic partnerships that contribute to long-term planning, strategy, and organisational transformation (ACCA, 2022; Cuganesan et al., 2012; Yazdifar & Tsamenyi, 2005; Rozaidy & Siti Nabiha, 2023; Gill & Sharma, 2023). Concurrently, shift in the basis of accounting for financial reporting and budgeting has further redefined accountants' responsibilities by strengthening their roles as the custodians of fiscal accountability and public interests (Sharma & Kaur, 2025). Therefore, accountants are expected to be strategic advisors while maintaining their role as the custodians of public resources and accountability.

3.0 Methodology

This research employed documentary analysis of publicly available government documents, information gathered from the websites of the central government accounting entities of the selected countries, social media, newspaper reports, speeches by officers, published journal articles and reports, and other publicly available information. However, as noted, there is a lack of relevant literature or published documents available on the issues investigated. Canada, New Zealand, and Singapore were selected as benchmarking countries for the Malaysian AGD, as the three (3) countries comprised more robust public financial management systems and financial reporting and accountability systems. Additionally, all three (3) countries were part of the Commonwealth, which shared certain similar legal and administrative structures, hence enabling the applicability of their respective practices to the Malaysian context. In addition, the three (3) countries were chosen due to variations in their institutional structures, which could provide more detailed insights analysis. Hence, the analysis was based on determining the core functions of the CGAAs in terms of their strategic and operational roles and the associated institutional factors and initiatives, namely, the legal mandate, accounting basis, digital infrastructure and innovations, and capacity-building framework. The benchmarking analysis was used to formulate suitable recommendations for the Malaysian AGD in terms of its roles and functions.

4.0 Findings

4.1 Malaysia – Accountant General's Department (AGD)

4.1.1 Structure and Core Function

The Malaysian AGD functions as the primary guardian of the financial integrity. Operating under the Ministry of Fnance (MOF), its mandate constitutionally entrenched and operationalised through the Financial Procedure Act 1957 [Act 61], which designates the Accountant General as the chief officer responsible for the management of the Federal Consolidated Fund (Accountant General's Department of Malaysia, 2026a). The AGD is headed by the Accountant General of Malaysia, who acts as the chief accounting officer for the federal government, providing a vital link between national fiscal policy and executive financial execution. To ensure an effective balance between centralised control and regional accessibility, the organisational structure of the AGD is strategically designed around several key pillars.

The first of these pillars involves a robust organisational hierarchy and specialised divisions. In particular, the department is divided into strategic units, including the Accrual Accounting Implementation Team, the Information Technology Management Division, which maintains the Integrated Government Financial and Management Accounting System (iGFMAS) infrastructure, and the Central Operation and Agency Services Division, thus enabling the AGD to execute complex statutory tasks, such as the consolidation of national debts, the administration of government investments, and the continuous oversight of the Consolidated Revenue Account (Accountant General's Department of Malaysia, 2026a). Complementing this is a distinctive decentralised branch network, which consists of a comprehensive system of state and branch accounting offices located across every Malaysian state, including Sabah and Sarawak, that function as the decentralised paymasters for federal civil servants at the local level, thereby ensuring that financial operations remain accessible nationwide (Accountant General's Department of Malaysia, 2026a).

Beyond conventional bookkeeping, the AGD serves as the legal custodian for various trust funds and the broader consolidated fund. This role includes the rigorous enforcement of the Unclaimed Moneys Act 1965 [Act 370], through which the AGD ensures that the funds held by corporations are either returned to rightful owners or safely managed by the state (Accountant General's Department of Malaysia, 2024). Moreover, the mandate of the AGD extends to the regulatory oversight of statutory bodies and local authorities. Through the Standard Accounting System for Government Agencies (SAGA) unit, the AGD prevent financial silos and facilitates the systemic transition towards the Malaysian Public Sector Accounting Standards (MPSAS) (Accountant General's Department of Malaysia, 2026b). In addition, the department plays a substantial role in socioeconomic administration by managing Government Housing Loans and collaborating with the Public Service Department (JPA) regarding pension disbursements, which highlights its status as a critical administrator of the internal financial obligations of the government.

4.1.2 Reformations and Digital Innovations

The Malaysian AGD has transitioned from being a passive record-keeper to a proactive driver of Malaysia's Digital Government agenda. These reforms are primarily anchored in the Malaysia Digital Economy Blueprint (MyDIGITAL) and the 12th Malaysia Plan (12MP), which aim to modernise public service delivery through advanced technology adoption (Accountant General's Department of Malaysia, 2026d). The key foundation of the above transformation is the evolution of the national accounting infrastructure, particularly through the advanced iGFMAS architecture, which, since its launch on 1 January 2018, has functioned as the foundation of the transition of Malaysia towards accrual accounting. The iGFMAS utilises a centralised database to provide a single source of truth for a total of 27 ministries and over 6,600 responsibility centres (Accountant General's Department of Malaysia, 2026c).

A critical reformation, namely, the seamless inter-agency system integration of iGFMAS with 98 other government agencies, including the e-Perolehan (electronic procurement) and e-Bantuan (aid distribution) systems. This integration ensures that the procurement-to-payment cycle is fully digitised, thereby reducing manual entry errors and increasing the speed of financial settlements. To strengthen internal governance, the AGD has also empowered its Internal Audit Management Division (BPAD) to conduct risk-based auditing and ensure rigorous compliance with financial regulations across all responsibility centres, which complements the external oversight provided by the National Audit Department and ensures a more robust check-and-balance ecosystem within the public sector (Accountant General's Department of Malaysia, 2026a).

For state-level entities, the SAGA acts as a digital equaliser and a catalyst for sub-national innovation, which guarantees that statutory bodies and local authorities will fulfil 12 functional and 8 technical criteria, including online workflow and electronic payments or receipts, before they are granted compliance certification (Accountant General's Department of Malaysia, 2026b). Beyond the software, the institutional reformation also involves a strategic shift to accrual accounting through the adoption of the MPSAS, which is intended to reveal the actual cost of public services by accounting for long-term liabilities, especially pensions and the maintenance of public infrastructure, hence offering a more transparent fiscal forecast (Azhar et al., 2023).

4.1.3 Capacity Building

Recognising that the efficacy of fiscal modernisation is inherently associated with the competency of executors, the AGD has concentrated on a structured, tiered approach to human capital development. The key to this strategy is the National Accounting Institute (IPN) or Institut Perakaunan Negara, which functions as the specialised section of the AGD to provide continuous professional upskilling, specifically for civil servants within the 'W' (Accounting and Audit) scheme. Accordingly, relevant training modules are engineered to facilitate the systemic transition from traditional cash-based bookkeeping to the more rigorous and complex MPSAS.

A landmark initiative in this professionalisation drive is the Public Sector Accounting Competency Framework (PSACF), which, instead of acting as a mere training manual, serves as a strategic blueprint that delineates the core and technical skillsets required at each service grade, ranging from entry-level accounting technicians to senior financial controllers. As such, the framework ensures that the workforce is not merely proficient in operating the iGFMAS software but also possesses the analytical depth necessary for high-level fiscal governance and decision-making (Jabatan Akauntan Negara Malaysia, 2023). While currently in a phased deployment, the PSACF aligns with the goal of the 12MP, namely, to foster a high-performance civil service defined by institutional excellence. Beyond internal training, the AGD has actively cultivated institutional synergies with external professional bodies to maintain global parity. Therefore, by maintaining close ties with the Malaysian Institute of Accountants (MIA), which is the statutory body established under the Accountancy Act 1967, the AGD can guarantee that government practitioners are held to the same ethical and technical benchmarks as their private-sector counterparts. Furthermore, collaborations with global entities, including the International Federation of Accountants (IFAC), allow the AGD to benchmark the reformations of Malaysia against the international highest standards (Ramli, 2018), thus guaranteeing that public financial management in Malaysia can be sustained by a future-ready workforce that is capable of navigating an increasingly digitalised fiscal landscape.

4.2 Singapore Accountant General's Department

4.2.1 Structure and Core Functions

The AGD of Singapore is an entity operating under the Ministry of Finance, in which the Accountant General (AG), namely the head of AGD, holds statutory responsibilities as stated in the Constitution, the Financial Procedure Act 1966, and other legislative instruments. The AG also functions as the Chief of Government Finance and is responsible for the supervision and administration of the accounting and financial management systems of the government. Specifically, the main functions of the AGD include managing the accounting framework of the government, preparing annual financial statements, administering public funds, overseeing payment and payroll systems, and formulating pertinent procedures for financial control and asset management, while stipulating accounting standards for statutory boards and reporting material financial irregularities to the relevant authorities. Moreover, the AGD plays a key role in promoting and advancing digital finance and whole-of-government (WOG) transformation, which is enabled by the integration of finance systems, the adoption of data analytics, and financial innovation, thereby contributing to higher degrees of fiscal governance, transparency, and accountability. Nonetheless, the financial statements of the Singaporean government are prepared on a cash basis with no indication of a shift towards accrual accounting.

4.2.2 Reformations and Digital Innovations

The vision of the Singaporean AGD is to be "a future-ready leader in transforming public sector finance and internal audit" (AGD Singapore, n.d-a), which seeks to promote innovations and data-driven practices as the key foundation for digital transformations in public-sector financial management (AGD Singapore, n.d-b; Pan & Chan, 2019). Various initiatives have been undertaken to modernise and transform public financial management, in which efficiency and accuracy in operations have been improved through automation and system integration, promoting data-driven decision-making to strengthen fiscal planning and oversight, and improving governance, transparency, and risk management. In addition, the optimisation of resource use has been fostered via harmonised data and streamlined processes, developed digital and professional competencies among finance and audit officers and facilitated WOG integration (Pan & Chan, 2019; AGD Singapore n.d-b). Accordingly, a unified financial data infrastructure supports these objectives by promoting collaboration across various government agencies. AGD has several directorates to enable innovation and leverage emerging technologies to further enhance analytical capability, transparency, effective financial management, and data-driven decision-making:

i. The Finance Transformation Group is responsible for driving the development of Future Finance by consolidating and integrating the finance and payroll systems into a cloud-based platform, reengineering workflows, streamlining processes, and strengthening governance across central finance, payroll, and claims systems.
ii. The Technology Directorate is responsible for information technology strategy, policies, and standards, including infrastructure, security, and system maintenance.
iii. The Finance Data and Analytics Directorate manages the WOG finance data warehouse and analytics platform, which enables public finance officers to use data analytics to inform decisions and improve the efficiency of financial management. (Accountant-General's Department, Singapore, n.d-b).

The integrated approach of the AGD in Singapore is illustrated through the development of the WOG data warehouse and analytical platforms, hence reflecting the commitment to facilitate innovation and data-driven practices (AGD Singapore n.d-b; Pan & Chan, 2019). Specifically, a key enabler of the above digital transformation of public financial management was the introduction of the Fi@Gov platform, namely, a WOG financial analytics system, in 2016 (Pan & Chan, 2019), which incorporated and cleansed financial data from different ministries and statutory boards into a unified data warehouse (Pan & Chan, 2019). The platform can be utilised by government officers to gain insights and enabled data-driven decision making through the support from real-time dashboards for benchmarking, trend analysis, and risk identification. As such, the information provided empowered public officers to visualise financial patterns, detect irregularities, and monitor key performance indicators. In addition, robotic process automation (RPA) was utilised to automate routine payroll audits and reconciliations, which, on top of elevating accuracy, enabled government officers to improve existing analytical and advisory functions to focus more on value-added activities. In sum, the efforts of the AGD in system development, RPA, cloud-based integration, and data-driven capacity building demonstrated how technologies have been leveraged to contribute to higher levels of efficiency, transparency, and analytical capability (Pan & Chan, 2019; AGD Singapore, n.d-b), thus positioning the AGD as a digitally advanced leader in public-sector financial management. Through these initiatives, AGD has moved beyond its traditional operational role as a backend finance administrator to become a strategic enabler of data driven public financial management.

4.2.3 Capacity Building

The AGD of Singapore is responsible not only for developing the capabilities and professionalism of its officers, but also those of the wider public finance community. This leadership role is reflected in the Accountant General also serving as the Chief of Government Finance, following the appointment as the as Head of Profession for Finance in 2018, with the responsibilities to enhance the professionalism of public finance officers. Furthermore, as aligned with the key objective of the AGD to modernise public-sector financial management, the Finance Academy was established to strengthen the technical and digital competencies of finance officers and develop a data-driven and analytical culture in the public sector. Moreover, in 2022, the AGD was accredited as an Approved Training Organisation (ATO) under the Singapore Chartered Accountant (CA) Qualification Framework (AGD Singapore, n.d-c), wherein the

AGD was authorised to train candidates who pursued the CA (Singapore) designation for three (3) years until 2026 (AGD Singapore, n.d-c). In essence, the above initiatives helped reinforce the strategic role played by the AGD in promoting professional excellence, strengthening digital readiness, and improving leadership capability in public-sector financial management in Singapore.

4.3 New Zealand – Office of the Government Accountant (OGA)

4.3.1 Structure and Core Function

During the late 1980s, New Zealand emerged as a global pioneer in the execution of New Public Management (NPM) reformations, which sought to transform the public sector into a more streamlined, result-driven, and transparent apparatus (Office of the Auditor-General, New Zealand, 2021). The main driver of the above reformations was the economic instability of the country, which was characterised by escalating debt, inflation, and high unemployment rates (Mintrom & Thomas, 2019). Accordingly, two (2) seminal pieces of legislation formed the foundation of the above transformation, namely, the State Sector Act 1988 and the Public Finance Act 1989 (Office of the Auditor-General, New Zealand, 2021). Specifically, the Public Finance Act 1989 established the modern statutory framework for fiscal governance, which pioneered the transition to accrual-based accounting. By the early 1990s, New Zealand had successfully migrated from cash-based records to a more holistic accrual system by incorporating output-based budgeting to fiscal allocations with results (Office of the Auditor-General, New Zealand, 2021), which necessitated that state agencies provide detailed accounts of both financial budgets and actual outcomes, thereby institutionalising the aspects of efficiency and transparency. Hence, the trajectory of financial reporting standards in New Zealand has seen continuous evolution to maintain its international standing. Following the use of sector-neutral standards in the 1990s and modified International Federation Reporting Standards (IFRS) in the 2000s, the government transitioned to Public Benefit Entity (PBE) standards, which were grounded in the International Public Sector Accounting Standards (IPSAS) (The Treasury New Zealand, 2024a), in 2014. Currently, the financial disclosures of the government remain compliant with the PBE IPSAS-based benchmarks, ensuring that New Zealand's fiscal reporting is both of high quality and internationally comparable (The Treasury New Zealand, 2024a). This dedication to fiscal rigour and performance-based accountability has solidified the reputation of New Zealand as a pioneer in public-sector financial innovation.

Occupying a critical role within this modernised framework is the Office of the Government Accountant (OGA), which was integrated as a specialised unit of the New Zealand Treasury in 2014 (The Treasury New Zealand, 2024b). Directed by the Chief Government Accountant to provides the strategic cohesion necessary to manage the diverse financial practices of the government. Its inception indicates a dedicated institutional effort to preserve and advance the efficiencies obtained from previous decades of reform. Particularly, the OGA primarily concentrates on enhancing the skills, capability, and awareness regarding Strategic Financial Management (SFM) across the wider public sector (The Treasury New Zealand, 2024b). As the central reporting and advisory authority, the OGA is mandated with several high-level responsibilities. A cornerstone of its operation is the consolidation of the Financial Statements of the Government of New Zealand, which represent the total public sector's annual accounts. In addition, the office prepares fiscal forecasts and strategy documents, such as the Budget Fiscal Strategy Report and Economic and Fiscal Updates (The Treasury New Zealand, 2024a). Beyond technical reporting, the OGA functions as a strategic consultant by offering thought leadership to senior officials on optimising financial practices, which reflects its essential role as a steward of the principle of value-for-money, namely, providing counsel on resource allocation to drive the most effective public-sector outcomes. It also maintains a critical collaborative role by operating concurrently with central agencies, including the Public Service Commission and Audit New Zealand and external stakeholders, to promote and uphold best practices in public-sector finance (The Treasury New Zealand, 2024b).

4.3.2 Reformation and Digital Innovations

The OGA and the New Zealand Treasury remain committed to the ongoing efforts of modernisation and innovation of the public-sector financial management systems in the nation. In recent years, a strategic priority has been the digital transformation of financial analytics and processes, which aim to refine the quality of data-driven decision-making, especially through the development of Matai by the Treasury, namely, a macroeconomic forecasting model designed to substantially elevate the precision of economic and revenue projections (The Treasury New Zealand, 2023). Implemented in 2018 as a substitute for its predecessor, the above modern instrument has helped empower fiscal analysts to simulate

diverse economic scenarios with a higher level of accuracy, thereby strengthening the foundations of long-term fiscal planning. Beyond internal modelling, the New Zealand government has pursued initiatives to democratise fiscal data and increase transparency, including the deployment of interactive online dashboards for budget visualisation and the systematic release of open data regarding financial performance. Although the above digital reformations have extended beyond the exclusive mandate of the OGA, they are fundamentally synchronised with the broader mission of the office to bolster the transparency and integrity of public financial administration (Ortynsky et al., 2025).

4.3.3 Capacity Building

A key dimension of the mandate of the OGA involves the systemic enhancement of institutional capability via the Government Finance Profession (GFP) initiative. Under the leadership of the OGA, the cross-governmental community of practice acts as a centralised hub for finance specialists to refine existing technical skills and disseminate professional expertise across the public sector (The Treasury New Zealand, 2024b). Through this strategic framework, the OGA provides the necessary coordination and leadership for establishing standards, training protocols, and career progression pathways for financial personnel across various agencies. This ensures that each government department maintains the requisite internal capacity for sophisticated and strategic financial oversight. A foundation of the developmental strategy is the Finance Development Programme, which delivers rigorous and structured learning opportunities specifically designed to advance the professional maturity of government accountants and financial analysts (The Treasury New Zealand, 2024b).

4.4 Canada - Office of the Comptroller General and Receiver General

4.4.1 Structure and Core Functions

At the federal level, the Financial Administration Act (FAA) has established the legal foundation for public-sector financial management in Canada, wherein the Office of the Comptroller General (OCG) and the Receiver General (RG) for Canada play complementary roles in ensuring satisfactory levels of transparency, accountability, and the stewardship of public funds. Having been re-established in 2003 within the Treasury Board of Canada Secretariat, the OCG offers government-wide leadership in financial management, internal audit, and comptrollership, as the body has been mandated to strengthen oversight, hence formulating relevant accounting policies, managing existing financial systems, and cultivating community capacity. Moreover, the Comptroller General is responsible for government-wide direction and leadership on comptrollership, particularly in the areas of financial management, management of assets and internal audit (Treasury Board of Canada Secretariat, 2024). Its broad functional scope includes overseeing investment planning, procurement, and the management of real property and material.

Furthermore, the Comptroller General reinforces accountability by directing internal audit practices and professional training across the financial community. Parallel to the strategic leadership of the OCG, the RG for Canada manages operational financial transactions by functioning as the sole custodian of public funds under the FAA, namely, having the legal authority to receive, record, and control all government financial inflows and outflows. Concurrently, the office oversees the Consolidated Revenue Fund, maintains the official Accounts of Canada, and publishes the Public Accounts of Canada, namely, the audited financial statements of the government. Historically, the RG served as the accountant and treasurer of the government since Confederation, with its primary duties involving issuing payments, accepting receipts, and ensuring the accurate preparation of the Public Accounts. In sum, both the OCG and the RG constitute the foundation of financial architecture in Canada, which guarantees a clear division between strategic oversight (OCG) and operational execution (RG), thus fostering a more effective framework of governance that focuses on continuous improvement.

4.4.2 Reform and Digital Innovation

Canada has transformed internal audit from a transactional activity into a strategic and government-wide function, which supports high-level risk management and decision-making. Specifically, the Treasury Board Secretariat positions internal audit as a core advisory function by providing feedback on governance and controls across all departments, with the Comptroller General offering explicit functional direction for financial management across the entire public service. Concurrently, Canada has invested in data-driven reporting tools, such as GC InfoBase, which bridges the gap

between operational custody and strategic analysis by converting audited accounts and central systems into policy-ready dashboards. By incorporating parliamentary reports and departmental data, GC InfoBase can produce visual analytics and open datasets, with Organisation for Economic Co-operation and Development (OECD) reports highlighting this platform as a premier example of integrating reporting tools to contribute to higher levels of transparency and evidence-based decision support (OECD, 2025).

4.4.3 Capacity Building

The OCG is explicitly tasked with investing in the capacity of the federal finance ecosystem, which includes managing recruitment pipelines, such as the Financial Officer Recruitment and Development and Internal Auditor Recruitment and Development programmes. Relevant leadership initiatives include the Next Gen Chief Financial Officer (CFO) programme and the Comptrollership Leadership Bootcamp, which target the development of executives. Through competency frameworks, career-path planning, and partnerships with the Canada School of Public Service, the OCG can cultivate the subsequent generation of chief financial officers, chief audit executives, and procurement leaders within the finance, audit, and acquisitions communities of the government (Government of Canada, 2025).

5.0 Discussion

5.1 The Strategic and Operational Role of CGAAs

All the CGAAs in this study have similar core responsibilities in terms of their operational accounting roles, including managing the accounting system, preparing government financial statements, guaranteeing full compliance with financial regulations, and managing public funds. However, there are significant differences in the extent of their strategic roles, as depicted in Table 1.

Table 1: The Role of CGAAs in the Benchmark Countries

Role	Malaysia	Singapore	New Zealand	Canada
Financial Reporting and Compliance	Prepares the financial statements of the federal government and ensures compliance with laws and accounting standards	Prepares annual financial statements, supervises the accounting system of the government, and reports irregularities	Produces financial statements of the government and fiscal forecasts, while ensuring transparency and accountability	Oversees government financial reporting and ensures compliance with the Financial Administration Acts
Accounting Standards and Reformations	Leads the accrual accounting implementation and develops the MPSAS	Establishes accounting standards for statutory boards and drives finance transformation and system integration	Leads strategic financial management capability and advises on accountability frameworks	Leads the development and implementation of accounting standards and financial reporting
Strategic Financial Leadership	Provides advisory and consultancy services to ministries and manages government funds and cash flow	Promotes fiscal sustainability and prudent resource use, while employing data analytics for financial management	Leads capability development across the public sector and integrates strategy, planning, and performance	Provides leadership on internal controls, risk management, and financial management modernisation
Governance and Accountability	Ensures compliance with financial laws and the instructions of the Treasury	Reports financial irregularities and stipulates procedures for the custody and disposal of public properties	Advises on accountability frameworks and promotes value-for-money and performance improvement	Support transparency and accountability through reliable financial information and controls
Resource Allocation and Budgeting	Manages government funds, cash flow, and accounting services	Administers payments of public monies and manages fiscal resources	Supports strategic financial management and resource allocation aligned with governmental objectives	Oversees financial planning, budgeting, and resource allocation policies
Innovation and Technology	Improves financial management systems	Drives government finance transformation and incorporates financial systems and data analytics	Collaborates with agencies to improve financial management and reporting quality	Leads financial management modernisation initiatives and adoption of best practices
Capability Building and Professional Development	Develops human resource capacity through training programmes	Raises public-sector financial management capability and promotes optimal practices	Leads the development of the government finance profession and capability-building programmes	Provides leadership in financial management practices and training initiatives

Compared to the other three (3) benchmarked entities, the Malaysian AGD has a narrower and more administrative scope, which concentrates mainly on core accounting operations, preparing annual federal accounts, maintaining the accounting system of the government, such as implementing the MPSAS and managing the SAGA system for agencies, and ensuring compliance with financial regulations. These functions align with the Malaysian AGD's role as the government's chief accountant and bookkeeper. More strategic responsibilities, such as fiscal forecasting, budget strategy formulation, and policy oversight, are under the purview of the MOF. On the contrary, Singapore, New Zealand, and Canada have broader strategic functions, wherein, in the above three (3) countries, the role played by the accountants of the government extends beyond operational functions to safeguarding fiscal sustainability, shaping financial policies, and ensuring the efficient management of public resources. In particular, the AGD of Singapore extends its core accounting functions through WOG financial transformation, including digital finance initiatives and reserve management. The New Zealand's OGA prepares the consolidated financial statements of the government while undertaking strategic functions, such as performing multi-year fiscal forecasting, supporting budget planning, advising on fiscal strategy, and enhancing strategic financial management capacity across government agencies. Meanwhile, Canada has a unique model comprising two (2) units, namely the OCG and RG, which collectively provide an enhanced strategic role alongside operational financial control. Accordingly, the OCG provides strategic direction, namely, government-wide financial leadership, including oversight of internal audit, asset management, procurement policy, investment planning, and capacity-building programmes for the government financial management community, whereas the RG oversees operational custodianship. Furthermore, the OCG has elevated the function of internal audit to a strategic role, which has rendered it central to accountability and financial risk management. In sum, the current analysis demonstrated that all four (4) benchmarked CGAAs performed core operational accounting functions, although the entities in Singapore, Canada, and New Zealand had broader strategic roles compared to that of the Malaysian AGD, owing to different institutional structures and initiatives.

5.2 The Institutional Structure and Initiatives

This study suggests that the extent of the strategic functions of CGAAs would be highly associated with their respective institutional structures and initiatives.

5.2.1 Legislative Mandate, Scope of Authority, and Accounting Basis

The four (4) countries exhibited profound variations in their legal mandates and the scope of authority of CGAAs. Specifically, the Malaysian AGD continued to operate under the Financial Procedure Act 1957, which was an outdated law inherited from the post-colonial era. In contrast, each of the three (3) benchmarked country had updated their respective legal framework: Singapore AGD functioned under the Financial Procedure Act 1966, supplemented by constitutional provisions for public finance; New Zealand under the Public Finance Act 1989; and Canada under the Financial Administration Act 1985, subsequently reinforced by the Federal Accountability Act 2006. These updated laws granted a broader scope of powers and responsibilities aligned with contemporary public financial management practices, whereas Malaysia's older Act did not fully incorporate relevant reformations.

All four (4) CGAAs operate within the executive government, but their organisational autonomy varies. Malaysia's AGD is a department within the MOF, and its mandate is largely administrative. The Singaporean AGD, despite also being under the MOF, had its authority anchored in the Constitution, with the Accountant-General the Chief of Government Finance, thereby reflecting a higher-level mandate to oversee government finance, as illustrated by its mission and vision to transform public-sector finance and internal audit while "putting finance at the heart of decision making" (AGD Singapore, n.d-a). Comparatively, the OGA in New Zealand acted as a specialised entity with both strategic and operational responsibilities, whereas the Canadian structures, with a distinct demarcation between operational control and strategic functions, created an internal check-and-balance system between the strategic oversight and operational control of public funds, thus enabling a broader strategic focus for its CGAA. Although none of the CGAAs above was fully independent of the central government, the AGD in Singapore was deemed as outstanding due to its constitutional duties, such as reporting to the president on financial irregularities and safeguarding reserves, which allowed the body to have a unique level of statutory authority.

5.2.2 Governmental Accounting Basis

The basis of governmental accounting would influence the capacity of accountants, support the adoption of strategically oriented practices, enhance professionalism, and the role played by accountants in the public sector (Rozaidy & Siti-Nabiha, 2023). The benchmarking analysis provides several important insights regarding the governmental accounting basis used in the selected countries. In particular, the governmental financial reporting approach in Malaysia was based on a modified cash system, which primarily concentrated on fulfilling statutory requirements, although iGFMAS could produce both accrual- and cash-based reports. Conversely, New Zealand and Canada adopted accrual accounting, which could explain the broader strategic role played by their respective CGAAs, as the use of accrual accounting could lead to more holistic and transparent financial reporting, hence providing a deeper understanding of the fiscal conditions of the government. Nonetheless, the basis of governmental accounting was not the sole factor contributing to enhanced strategic capability. Although Singapore operated on a cash-based governmental accounting system, the strategic role played by the AGD could be attributed to its broader scope of authority and its strong emphasis on digital finance transformation.

5.2.3 Digital Financial Transformation in the Public Sector

Digital financial transformation has become an important component of public-sector accounting and finance and, consequently, an important factor contributing to the strategic capability and role played by accountants. This is evident in Singapore AGD's efforts to integrate emerging technologies into public finance through investments in financial systems transformation, analytics, and enterprise-wide standardisation. Specifically, the Singapore's AGD maintained a WOG finance data warehouse and analytical platform and anchored cloud-based central corporate systems across statutory boards, which emphasised transformation at scale through cloud-based Enterprise Resource Planning (ERP), RPA for routine finance tasks, and advanced analytics for real-time visibility (Pan & Chan, 2019). These technologies are leveraged to enable better data-driven decision-making processes, thereby strengthening its strategic role.

Similarly, Canada and New Zealand employed digital technologies to enhance existing strategic functions. Canada's CGAA, supported by its broader financial management system, emphasises interactive reporting, analytics, and integrated data to support decision-making. Thus, through platforms such as GC InfoBase, Canada focused on performance information, fiscal discipline, and the capacity to use data for outcome-oriented decisions. An OECD study outlines how GC InfoBase supports evidence-based policymaking by linking audited accounts and central systems into analysis-ready dashboards (OECD, 2025). Likewise, New Zealand's OGA has spearheaded digital finance transformation initiatives, aligning them with the broader national digital government agenda.

By contrast, Malaysia's AGD is still undergoing phases of digital transformation, although significant progress has been made through central systems and accrual-transition programmes. Particularly, the iGFMAS, with its 17-module platform, currently supports federal financial statements and government-wide integration of payments, assets, loans, and receipt processes. Moreover, the AGD has launched the Electronic Government Unclaimed Money Information System (eGUMIS) and adopted RPA to accelerate refunds of unclaimed monies, thus demonstrating growing digital capability. However, Malaysia's digitalisation efforts have not yet achieved full integration of digital payments, analytics, and enterprise-wide dashboards, thus limiting its capacity to fully support a broader strategic function and facilitate evidence-based financial decision-making.

5.2.4 Capacity Building

Differences in the scope of authority and roles are reflected in initiatives related to human resource development. Malaysia focuses on capacity building for public-sector accountants, whereas Singapore, Canada, and New Zealand have extended their focus to broader finance professionals within the public sector. Specifically, the Singaporean AGD, through its Chief of Government Finance role, Finance Academy, and status as an ATO under the Chartered Accountant (Singapore) framework, has cultivated numerous public-sector finance professionals for leadership roles and strategic capability enhancement. Similarly, the New Zealand OGA collaborates closely with the government finance profession to help reinforce its existing strategic finance capability, whereas the OCG in Canada concentrates not only on accountants but also on other professional communities, including chief financial officers, internal auditors, and procurement specialists.

6.0 Recommendations and Conclusions

To strengthen its strategic capacity and decision making authority, the AGD of Malaysia can draw on insights and lessons from the three (3) benchmarked countries, which demonstrate how well-defined institutional structures and accrual-based accounting systems, as implemented in Canada and New Zealand, and digital innovations, particularly in Singapore, can help contribute positively to the role of accounting entities as strategic partners in public-sector financial management. The adoption of accrual-based accounting system has elevated the professional status and influence of public-sector accountants, which has positioned them as key contributors to policy formulation. Nonetheless, the implementation of accrual-based accounting in Malaysia requires amendments to existing legislation, although the AGD of Malaysia has made significant efforts to support the transition to an accrual-based accounting system through the development of human resources and technological infrastructure.

Transition to accrual accounting alone is not sufficient to develop strategic capability of the AGD. The Singapore case shows the importance of leveraging technology for cultivation of strategic capability, despite maintaining a cash-based system. As such, the AGD in Malaysia should seek to strengthen the capabilities of public-sector accounting officers and invest in emerging technologies, subsequently becoming the central authority in digital finance innovation and public financial management. Investment in a centralised data analytics platform would enable more accurate real time data accessibility and support more predictive as well as prescriptive insights, thus promoting data-based decision making. Developing a digital finance and innovation strategic framework is essential for this purpose. Technology enabled public sector financial management requires capacity building for accounting and finance officers to cultivate necessary skills and competencies including in data analytics, strategic policy analysis, and problem solving.

Broadening the strategic role of the AGD, beyond structural changes, requires sustained political commitment, amendments to the current legal and regulatory framework, investment in emerging technologies, and the development of required competencies among accounting and finance professionals in the public sector. Nevertheless, undertaking accounting reformations, including digital public finance innovation, will be more challenging for Malaysia compared to New Zealand and Singapore, owing to its more complex three-tier governmental structure. As such, adhering to the Canadian model of separating operational control and strategic focus, namely, between the OCG and RG, might not be suitable for Malaysia, due to restructuring challenges and potential institutional resistance. Although the above recommendations can serve as a guide to reinforce the role played by the AGD of Malaysia, the findings and recommendations should be interpreted based on the limitations of the current study. In particular, the present study was exploratory, as it was based solely on the documentary review of publicly available information from the three (3) selected countries, which necessitated more in-depth perspectives that could be gained through interviews, surveys, and broader international benchmarking involving additional countries. Despite these limitations, this study provided several important insights, particularly on issues not fully explored in the literature. One key insight is that institutional structures and initiatives could support the strategic and operational functions of central government accounting authorities. Concurrently, digital transformation in public financial management is essential to further strengthen the strategic capability and role of central government accounting authorities. Hence, AGD's position and authority need to be strengthened to realise its vision of excellence in public accounting and finance, ultimately enabling the AGD to effectively fulfil both its operational responsibilities and broader strategic roles in the Malaysian public sector.

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Valuation Methods for Assessing Government-Owned Heritage Buildings in Malaysia

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Abstract

Purpose: The current paper sought to identify and evaluate valuation and measurement approaches for government-owned heritage buildings in Malaysia to address existing methodological gaps under the Malaysian Public Sector Accounting Standards (MPSAS) while proposing a Malaysia-tailored framework that could help balance financial accountability with cultural stewardship.

Design/ Methodology/ Approach: Empirical evidence was gathered via three (3) focus group discussions (FGDs), which were conducted in Melaka (n=15), Pulau Pinang (n=19), and online (n=14), involving private registered valuers, valuers from the Valuation and Property Services Department (JPPH), local-authority officials, architects, conservators, and academics. Specifically, the present study performed FGDs to bridge the methodological gap in valuing non-market heritage buildings by eliciting multidisciplinary expert consensus to develop a standardised valuation framework for public-sector accrual accounting, with all transcribed discussions analysed thematically and triangulated with documentary evidence.

Findings: The current research concluded that government-owned heritage buildings in Malaysia should be valued using a cost approach, which focused on reproduction cost rather than being recorded at a nominal value of RM1, thereby ensuring full compliance with accrual accounting under MPSAS 17. Particularly, the above valuation approach utilised a combination of two (2) approaches, wherein land value was determined through the comparison method, whereas the building value was calculated based on the current construction costs adjusted by heritage factors (50 to 70%), such as rare materials and architectural significance and less accumulated depreciation. Moreover, this study identified a total of seven (7) critical valuation dimensions, including aesthetic value and national significance, and highlighted that, although the physical structure depreciated, the heritage significance would not. In essence, the present research advocated for a national heritage valuation guideline and multidisciplinary collaboration to guarantee that financial reporting would accurately reflect the service potential and cultural stewardship of the assets of the nation.

This article is part of a research on *Penentuan Kaedah Penilaian dan Pengukuran Aset Ketara Warisan bagi Kerajaan Persekutuan Malaysia* through *Geran Penyelidikan Perakaunan dan Kewangan Sektor Awam Tahun 2025* (JANM.600-20/1/7 Jld. 2 (42)).

Keywords: Government-owned heritage buildings, valuation for accrual accounting, public sector accounting, Malaysian Public Sector Accounting Standards (MPSAS), Malaysian Valuation Standards (MVS)

1.0 Introduction

The preservation and accurate valuation processes of government-owned heritage buildings in Malaysia have presented a multifaceted challenge, particularly owing to the inherent difficulties in applying conventional valuation methodologies to non-market goods, wherein the heritage buildings, which often lack direct market transactions, necessitate alternative approaches that can adequately capture their multifaceted values through social, cultural, historical, and economic dimensions (Iida & Fukushige, 2025). The above complex situation has been further exacerbated by the limited financial capacity of local planning authorities for initiatives related to conservation and preservation, which reflects the urgent need for more robust and sustainable valuation frameworks (Azmi et al., 2018). Hence, the current study aimed to critically examine existing valuation methods and propose an integrative framework, which was tailored to the unique context of heritage assets in Malaysia, thereby addressing the existing gap in the current literature, namely, the requirement for a more holistic and sustainable model for the management of heritage property in developing nations (Azmi et al., 2018). Accordingly, government-owned heritage buildings, including historical buildings, monuments, and archaeological sites, represent invaluable cultural capital that extends beyond economic values, hence necessitating the valuation process of the above buildings using a more distinctive approach, as the heritage buildings hold architectural, cultural, historical, and social significance. Specifically, an effective process of valuation should capture not only their physical attributes but also their social, economic, and symbolic values that can help strengthen local identity and support sustainable development. Thus, a proper process of valuation serves as a vital tool for governments, planners, and conservation authorities in guiding the procedures of preservation, funding, and policymaking, as the heritage buildings embody the collective memory and identity of the nation, hence indicating the importance of accurate and context-sensitive valuation in more effectively safeguarding the buildings for future generations.

According to Mohamad et. al (2021), heritage properties can generally be categorised into two (2) primary groups based on ownership and purpose, namely public heritage buildings, which are managed by governmental agencies and preserved for cultural continuity, and private heritage buildings, which are maintained by individuals or corporations for commercial, tourism, or conservation purposes. Furthermore, there has been growing interest in the valuation of heritage properties among existing scholars, particularly in determining the most appropriate methodologies for assessing the multifaceted value dimensions of the properties (Iswari & Mediawati, 2024a; Dragouni, 2022; Ouda, 2014). Despite the growing attention, the appraisal of heritage buildings remains an enduring challenge, due to their unique characteristics and non-market nature relative to conventional real estate (Aversano & Caterina, 2012; Bakri et al., 2012; Barton, 2000). Specifically, heritage properties have rarely been transacted on open markets, which has rendered the properties difficult to establish comparable market evidence or apply standard valuation techniques. In addition, the distinctiveness and cultural specificity of the heritage properties have introduced complexities that conventional models, which have been primarily designed for income-generating or market-traded buildings, often fail to adequately address the current challenges. In a review, Mohamad and Ismail (2019) identified several recurring challenges associated with the valuation of heritage buildings in both theoretical and applied contexts and discovered a total of four (4) critical issues. In particular, there were profound conceptual intricacies in defining and classifying heritage buildings while accounting for multidimensional values, including aesthetic, architectural, social, historical, and spiritual significance (Aversano & Caterina, 2012; Throsby, 2001), coupled with the limitations of traditional statistical and market-based methods, which could not effectively capture essential intangible and non-use values, such as intrinsic, bequest, and symbolic importance (Ruijgrok, 2006; Mourato & Mazzanti, 2002).

Apart from the above two (2) issues, there were major concerns about the effectiveness of the current valuation approaches, in which existing methodological inconsistencies and a lack of cultural indicators often yielded unreliable or incomparable results across jurisdictions (Dragouni, 2022; Iswari & Mediawati, 2024b). Additionally, the valuation process was hindered by limited data availability, which constrained the quantification of heritage-related benefits owing to an absence of relevant information on the key aspects, including conservation costs, physical conditions, and community perceptions (Bakri et al., 2012; Ouda, 2014), originating from the multifaceted nature of heritage, namely, transcending physical form and encompassing emotional, intangible, and communal values (Throsby, 2001).

As a result, conventional methods, such as the historical cost approach, are not effective in the valuation process of heritage buildings, as the above methods will record assets only at their acquisition cost, thereby disregarding appreciation, uniqueness, or symbolic worth (Mourato & Mazzanti, 2002). Similarly, market-based valuation methods, which rely on comparative sales, are impractical for government-owned heritage properties that are not actively traded (Ruijgrok, 2006). Therefore, valuation outcomes have frequently varied substantially depending on the methodological assumptions and available data, which highlights the need for hybrid or multi-criteria frameworks that can effectively incorporate cultural, economic, and social indicators to more accurately represent the full value of heritage buildings (Mohamad, Ismail & Mohd Nasir, 2021; Dragouni, 2022; Iswari & Mediawati, 2024a).

1.1 Issues and Challenges in Valuing Public-Owned Heritage Buildings in Malaysia

The process of valuing government-owned heritage buildings in Malaysia requires a tailored approach that can more accurately reflect their cultural, historical, and architectural significance. Contrary to commercial properties, heritage buildings are maintained for public benefits rather than profit generation, hence highlighting that the above buildings often lack active markets and measurable income streams and the use of conventional valuation methods, including the market or income approach, is unsuitable. In practice, Malaysian valuers tend to adopt the cost approach, which estimates the replacement or reproduction cost while adjusting for depreciation, aligned with public-sector priorities of transparency, accountability, and stewardship to guarantee that heritage buildings are appropriately recognised within the existing frameworks of financial reporting and urban policymaking (Iswari & Mediawati, 2024a). Nevertheless, valuing the heritage properties remains inherently complex, due to both tangible and intangible elements that influence their worth.

Table 1: Key Challenges and Implications for Valuing Public-Owned Heritage Buildings in Malaysia

Key Challenge	Description	Implication for Malaysia Valuation Practices
Lack of Market Comparables	Heritage buildings are rarely traded, and no recent sales data exist for benchmarking.	Valuers must rely on subjective estimation, hence limiting valuation accuracy and comparability across public agencies. Alternative models, such as cultural value indexing or qualitative scoring, are required.
No Income Generation	Most public heritage buildings do not produce financial returns or cash flows.	The income approach becomes impractical, and valuers must justify preservation costs through non-financial benefits, such as cultural identity, educational impact, and tourism value.
Estimating Replacement or Reproduction Cost	Original materials and techniques are often unavailable or obsolete, rendering cost estimation difficult.	Replacement cost calculations become speculative, in which reproduction estimates must include intangible authenticity, heritage-grade materials, and restoration craftsmanship.
Depreciation Complexity	Heritage buildings do not follow normal depreciation patterns and may appreciate in cultural value over time.	Requires modified depreciation models that consider functional wear and cultural appreciation simultaneously, whereas standard accounting methods risk misrepresenting true asset value
Intangible Cultural and Symbolic Values	Emotional, social, and historical significance cannot be easily monetised.	Financial valuation must be complemented by qualitative assessment tools and stakeholder consultation to capture cultural impact beyond economic indicators.
Compliance with Standards	MPSAS 17 and MVS 2025 lack detailed guidelines for the valuation of heritage assets.	Inconsistent valuation practices among governmental departments require a national heritage valuation framework for valuing heritage buildings in Malaysia.
Need for Multidisciplinary Collaboration	Valuation requires inputs from multiple experts, including valuers, historians, conservationists, and engineers.	Ensures holistic and credible valuations, yet increases costs and duration, hence calling for institutionalised collaboration mechanisms within existing governmental valuation processes.

Valuing heritage buildings in Malaysia has presented several key challenges, including the absence of market comparables, owing to infrequent transactions, which has compelled valuers to depend more on subjective estimation and alternative models. As most government-owned heritage buildings will not generate any income, traditional financial valuation methods, such as the income approach, are unsuitable, thereby requiring a higher emphasis on non-financial benefits, including cultural identity and tourism. Furthermore, the estimation process of replacement or reproduction costs is complicated by the use of obsolete materials and construction methods, whereas depreciation models should account for both physical wear and potential cultural appreciation. Moreover, intangible cultural and symbolic values are difficult to monetise, which necessitates qualitative and participatory assessment approaches. The absence of detailed guidelines in MPSAS 17 and MVS has also led to inconsistent practices, which require a national framework that is aligned with International Public Sector Accounting Standards (IPSAS 45). In addition, accurate valuation depends on multidisciplinary collaboration among valuers, historians, engineers, and conservation experts, which, despite being essential for credibility, will increase the cost and duration of the process.

2.0 Literature Review

Valuing government-owned heritage buildings involves a complex process that extends beyond traditional market-based valuation methods, as the process requires an interdisciplinary approach that can effectively incorporate cultural, social, and economic perspectives to capture their intangible historical and symbolic significance.

2.1 Factors Influencing the Valuation of Government-Owned Heritage Buildings in Malaysia

The valuation process of government-owned heritage buildings in Malaysia represents a vital linkage between public-sector financial accountability and cultural heritage preservation. As guided by the MPSAS 17 and the Public-Sector Transformation Policy (2018), the shift towards an accrual-based accounting framework since 2018 has sought to enhance transparency, accountability, and fiscal management within the public sector. In the above setting, the valuation of heritage buildings transcends monetary considerations, as it acknowledges their cultural, historical, and social importance as the key components of the collective identity of the nation (Rosli & Kamaluddin, 2024). Contrary to ordinary tangible buildings, heritage properties possess intangible attributes, such as craftsmanship, architectural symbolism, and cultural meaning, that challenge the application of traditional valuation techniques (Ho, 2019; Duval et al, 2019). Hence, Malaysian valuers are encouraged to employ a multidimensional and context-sensitive approach, which encompasses both tangible and intangible aspects, including national significance, design, building specifications, aesthetic quality, size, structural conditions, and maintenance standards (Chin et al., 2021; Mohamad & Ismail, (2019); Sesana et al, 2021), hence guaranteeing that valuation practices not only comply with accounting requirements but also honour the heritage value and stewardship obligations entrusted to public authorities. Table 2 summarises the principal valuation dimensions and their conceptual foundations as reflected in the current Malaysian and international literature.

Table 2: Factors Influencing the Valuation of Government-Owned Heritage Buildings in Malaysia

Aspect/ Topic	Description	Key Reference
Design	Malaysian heritage buildings display Malay, colonial, Chinese, and Islamic architectural styles, which constitute part of their identity and historical significance, with the architectural design influencing valuation due to its uniqueness and impact on restoration or reproduction cost.	Chun et al. (2005)
Building Specification	Involves materials, construction techniques, and finishes, such as chengal wood, lime plaster, and terracotta tiles, that are currently rare or costly. Hence, valuers should consider the availability and expense of replicating the above elements when estimating replacement or restoration costs.	Sandeford (2005)
Aesthetic Value	Refers to the visual and artistic appeal, including decorative details, craftsmanship, and symmetry. In Malaysia, landmarks, such as the Sultan Abdul Samad Building and Cheong Fatt Tze Mansion, hold profound aesthetic value, which can contribute to higher degrees of public appreciation and tourism potential even without direct financial returns.	Chin et al. (2021)

Table 2: Factors Influencing the Valuation of Government-Owned Heritage Buildings in Malaysia (continued)

Aspect/ Topic	Description	Key Reference
Building Size	The size and scale of a heritage building influence both its functional use and maintenance costs. Larger structures, such as colonial government complexes, necessitate more resources for restoration and preservation.	Jamal et al. (2022)
National Value	Multiple heritage buildings serve as symbols of national identity, which is linked to historical events and cultural heritage. For example, Merdeka Stadium symbolises national independence, and this intangible national value can strengthen collective memory and cultural pride, even if not monetarily quantifiable.	Hasif Rafidee (2015)
Structural Intactness	The physical conditions of heritage buildings determine the current value and restoration needs. Due to the humid and tropical climate in Malaysia, buildings are prone to deterioration from termites and monsoons. Assessing foundations, walls, and roofs can help estimate conservation costs and remaining life.	Sesana et al. (2021)
Quality Maintenance	Ongoing and historical maintenance quality will influence longevity and valuation, wherein effective care by relevant agencies, especially Jabatan Warisan Negara, can assist in sustaining heritage integrity, with valuers frequently considering routine upkeep costs, the availability of skilled conservators, and long-term preservation sustainability.	Esraa & Meervat (2023)

2.2 Laws Related to Heritage Property and Valuation Practices in Malaysia

In Malaysia, the National Heritage Act 2005 (Act 645) functions as the fundamental legal framework for the identification, protection, and conservation of tangible heritage properties. Tangible heritage, as defined under the Act, encompasses all physical, visible, and touchable elements that embody the cultural and natural legacy of Malaysia, which includes heritage buildings, monuments, archaeological sites, and natural landscapes that reflect the historical and architectural identity of the nation. In line with international conventions, such as the UNESCO World Heritage Convention (1972), the Act incorporates both cultural and natural dimensions and emphasises the importance of holistic heritage management and sustainable conservation. Additionally, under the National Heritage Act 2005 (Act 645), Malaysian heritage is classified into four (4) main categories, namely, heritage site, heritage object (tangible or intangible), underwater cultural heritage, and living persons, which have been gazetted for protection based on cultural, historical, or natural significance, with national heritage representing the highest status:

i. **Heritage Site:** Immovable heritage, including areas, places, zones, monuments, buildings, archaeological reserves, gardens, and trees.
ii. **Heritage Object:** Movable items, including antiquities (above 50 years old), artefacts, and intangible cultural heritage, such as music, language, literature, and performing arts.
iii. **Underwater Cultural Heritage:** Submerged traces of human existence, including shipwrecks, artefacts, and structures, which are typically submerged for at least 100 years.
iv. **Living Person:** Individuals who are recognised for possessing exceptional knowledge or skills essential for creating or performing intangible cultural heritage.

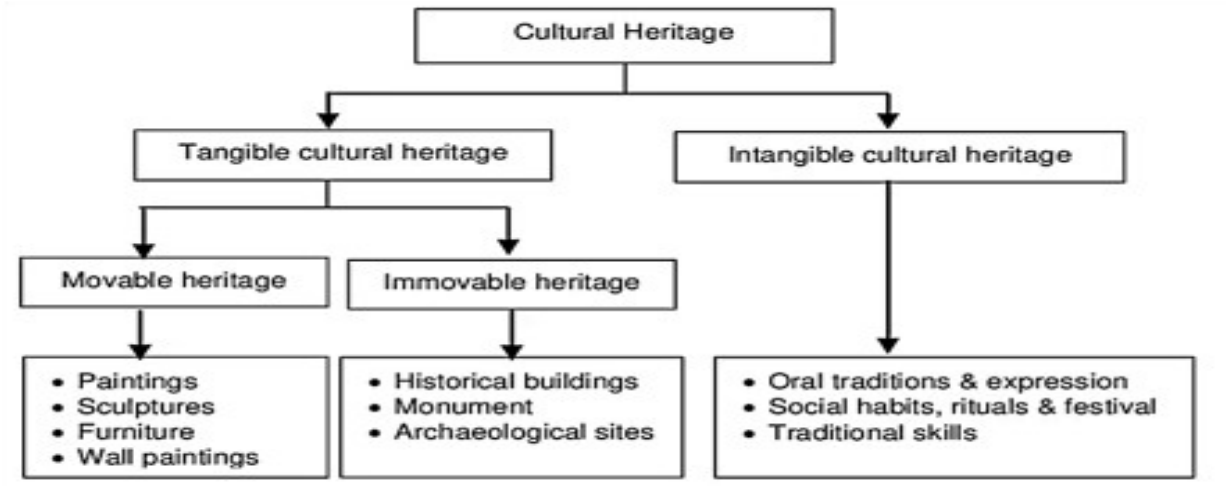

Figure 1: UNESCO Heritage Classification

Figure 1 presents a structured hierarchy of cultural heritage, which is categorised into tangible and intangible groups to distinguish between physical objects and living traditions, with tangible cultural heritage further classified into movable heritage, including transportable items such as paintings, sculptures, furniture, and wall paintings, and immovable heritage, which encompasses fixed structures such as historical buildings, monuments, and archaeological sites. Conversely, intangible cultural heritage involves non-physical attributes that define the identity of a community, including oral traditions, social habits, rituals, festivals, and traditional skills. In essence, the above classification provides the key conceptual foundation for identifying different types of assets, such as those defined under the National Heritage Act 2005, which require specialised valuation approaches for public-sector accrual accounting. Meanwhile, from a valuation perspective, the National Heritage Act 2005 primarily focuses on conservation and protection, with limited guidance on how such properties should be valued for financial reporting, compensation, or redevelopment purposes. Table 3 depicts the Malaysian laws and regulations related to heritage property valuation. Notwithstanding, the current legislative gap has frequently rendered Malaysian valuers in a challenging position when determining the economic, cultural, and social value of heritage buildings, wherein valuers are often required to rely on professional judgment and adapt existing valuation standards to account for the intangible significance and non-market attributes of the heritage properties.

Table 3: Malaysian Laws and Regulations Related to Heritage Property Valuation

Law/ Regulation	Relevance to Heritage Property Valuation
National Heritage Act 2005 (Act 645)	Focuses on the protection and preservation of heritage buildings, and also defines and classifies tangible and intangible heritage. Nonetheless, the Act lacks explicit valuation procedures, hence rendering valuers to interpret heritage significance within conventional property frameworks.
Town and Country Planning Act 1976 (Act 172)	Regulates development activities involving heritage properties, with local authority approval required for any alteration or reconstruction to ensure the preservation of the façade and historical character, which are factors that will directly influence the market value and development potential.
Local Government Act 1976 (Act 171)	Empowers local authorities to oversee the maintenance and repair of heritage buildings, and maintenance obligations may increase ownership costs and influence the depreciated replacement cost (DRC) or investment value of heritage buildings.
Malaysian Valuation Standards (MVS) (BOVAEP, 2025)	Provides the general framework for property valuation, yet lacks specific methodologies for heritage buildings. Therefore, valuers must use relevant principles, such as the cost approach or market comparison, with substantial adjustments to reflect heritage restrictions and uniqueness.
Malaysian Public Sector Accounting Standards (MPSAS 17)	Defines heritage buildings as properties with historical, cultural, or environmental significance and acknowledges that market-based valuation may be impractical, which allows for non-financial or nominal value recognition to reflect public benefit and stewardship obligations.

2.3 Heritage Asset for Accrual Accounting

Heritage buildings are recorded under Heritage Assets (A1900000 is an account code used in the Malaysian Public Sector chart of accounts), which represent items of historical, cultural, artistic, technological, or environmental significance that can contribute to the collective knowledge and cultural identity of the nation. Accordingly, the heritage buildings are classified separately, as it is challenging to determine their precise financial value, owing to their unique and irreplaceable nature. Notably, the value of heritage buildings may increase in the long term, contrary to typical assets that depreciate. As stated in Accrual Accounting Policies and Interpretations (Revised January 2026):

> "Heritage asset shall be recorded in the accrual ledger if it is gazetted under the National Heritage Act 2005. If cost is available, it shall be measured at cost. If it is impractical to determine the cost, it shall be measured at the nominal cost of RM1." (Accountant General's Department of Malaysia, 2017).

Within Account Class A1900000, there is a specific element recognised as Heritage Buildings (1932000), which is recorded separately from other heritage buildings to guarantee more transparent and detailed reporting, supported by Category A4600000, namely, Accumulated Impairment of Heritage Assets, mainly to account for the total impairment of all assets categorised as heritage assets that are held for their cultural, environmental, or historical importance. In accordance with MPSAS 21, the Impairment of Non-Cash-Generating Assets is defined as a loss in the future economic benefits or service potential of an asset, apart from the systematic recognition of such loss through depreciation, which suggests that if a heritage building suffers damage or a reduction in its functional, historical, or cultural value, the building must be recorded as an impairment to accurately reflect the actual conditions of the asset in public-sector financial statements.

2.4 Valuation of Public-owned Heritage Buildings for Public Accounting in Malaysia

The MPSAS, which are aligned with the IPSAS, require governmental entities to prepare accrual-based financial statements that can more accurately reflect the actual value of public assets, such as land, buildings, infrastructure, and heritage properties. In particular, the valuation approaches under MVS 7, namely the market, income, and cost Approaches, play a critical role in supporting asset recognition, measurement, and disclosure (Malaysian Valuation Standard, 2025), as illustrated in Table 4. Specifically, the valuation process of public assets in Malaysia utilises three (3) primary approaches to guarantee full compliance with the MPSAS, in which the market approach is employed for properties with active market comparables, hence aligning with the fair value requirements of MPSAS 17 and MPSAS 16, whereas for investment or revenue-yielding assets, such as leased properties and concession-based facilities, the income approach is applied, thereby supporting standards, such as MPSAS 16, MPSAS 13, and MPSAS 21. Meanwhile, the cost approach has been widely adopted for specialised and non-cash-generating infrastructure, including schools, hospitals, and roads, especially when market or income data are unavailable, thus ensuring higher consistency with MPSAS 17, MPSAS 31, and MPSAS 32. Collectively, the above three (3) methodologies provide a more reliable and transparent framework for asset valuation, which can assist in fulfilling the financial reporting obligations of the public sector.

Table 4: Valuation Approach and Its Application in Public-Sector Accounting

Valuation Approach	MPSAS Applied	Typical Use in the Public Sector
Market/ Comparison	MPSAS 17, MPSAS 16	Land, buildings with active market sales, such as office buildings and land
Income	MPSAS 16, MPSAS 13, MPSAS 21	Investment properties, leased buildings, and revenue-generating assets, including office buildings that rent out to other parties
Cost	MPSAS 17, MPSAS 31, MPSAS 32	Infrastructure, specialised buildings, and non-cash-generating assets, such as heritage buildings

2.4.1 Market Approach

The market or comparison approach, as denoted in the MVS 2019, determines property value by comparing recent transactions of similar buildings conducted under open-market and independent conditions (Mohamad & Ismail, 2019; BOVAEP, 2025), which adheres to the principle of substitution and assumes that a rational buyer would not pay more for a property than the price of an equivalent alternative. Accordingly, adjustments are performed for variations in size, location, tenure, and condition to ensure a higher level of comparability (Raja Ariffin et al., 2021). Under the MPSAS, notably MPSAS 17: Property, Plant and Equipment and MPSAS 16: Investment Property, the market approach offers the most reliable estimate of fair value for properties with active markets, which is particularly applicable to government-owned office buildings, staff quarters, or investment properties that are situated in areas with more transparent pricing (Hassan et al., 2016). For compliance purposes, valuers should ground their analysis on verifiable market data, including recent transactions recorded by the Valuation and Property Services Department (JPPH) or auction results, ensuring evidence-based and auditable valuations consistent with international standards (Junainah, 2018).

2.4.2 Income Approach

The income approach, which is outlined in MVS 7 and aligned with MPSAS 16 and MPSAS 13 (Leases), estimates value based on the present worth of expected future income or cash flows, which is primarily applied to income-generating public buildings, such as government-leased offices, markets, or public private partnership (PPP)-managed facilities (Adamus, 2023). Particularly, the method involves forecasting net annual income, deducting operational costs, and applying an appropriate capitalisation or discount rate derived from market evidence (Ribera et al., 2020). Nevertheless, in the Malaysian public sector, the above approach is less common due to the non-revenue characteristics of most governmental buildings, including hospitals, schools, and museums. Notwithstanding, the approach remains important for revenue-yielding properties or concession-based infrastructure projects, wherein periodic income is measurable (Iswari & Mediawati, 2024b). When the approach is employed under MPSAS 21 (Impairment of Non-Cash-Generating Assets), it can help estimate the service potential of an asset, thereby supporting more transparent financial reporting and asset management.

2.4.3 Cost Approach

The cost approach has been the most widely used method for the valuation of heritage and public-sector properties in Malaysia, owing to its transparency and consistency (Mohamad et al., 2015), which estimates value based on the current replacement or reproduction cost and less accumulated depreciation, especially appropriate when market or income data are unavailable, often the case for heritage buildings, such as the Stadthuys in Melaka or Bangunan Sultan Abdul Samad. Under MPSAS 17, MPSAS 31 (Intangible Assets), and MPSAS 32 (Service Concession Arrangements), the cost approach provides a defensible measure of the value of public assets by reflecting restoration costs and asset stewardship obligations (Hassan et al., 2016). Depreciation factors, such as physical wear, functional obsolescence, and economic decline, are assessed according to useful life and service potential. In essence, as heritage properties rarely generate income or have comparable market data, the cost approach can aid in guaranteeing a fairer representation of value, while supporting governmental accountability and long-term conservation planning (Albu, 2021; Augustiniok et al., 2022).

3.0 Methodology

The current study employed a qualitative research design, namely, semi-structured interviews and FGDs, to explore expert perspectives on the valuation process of government-owned heritage buildings in Malaysia. Specifically, the use of semi-structured interviews was essential for capturing the expert opinions and field experiences among a total of 21 senior practitioners, who were typically not available in standard surveys or document reviews. By engaging representatives from 14 diverse organisations, including governmental agencies such as Jabatan Tanah & Survei Sarawak and private firms such as Knight Frank, the above method offered in-depth insights into the current practices and practical weaknesses within the Malaysian context. Concurrently, the interviews allowed respondents to exercise professional judgment in identifying the necessary valuation guidelines and benchmarking optimal practices for the valuation process of heritage properties. Meanwhile, the FGDs were conducted to facilitate collective reflection and establish professional consensus among a total of 48 multidisciplinary participants across Melaka, Penang, and

virtual platforms, which was important for bridging the gap between various stakeholders, such as valuers, historians, conservationists, and engineers, to guarantee a more holistic and credible valuation framework. Furthermore, the FGDs allowed the current researchers to capture regional variations in administrative frameworks and align practical insights with the specific requirements of accrual accounting under MPSAS 17.

3.1 Semi-Structured Interview

The current study adopted semi-structured interviews to obtain in-depth perspectives on the current practices, challenges, and recommendations related to the valuation of heritage properties in Malaysia. Specifically, the interview method was selected, as it enabled respondents, who were experienced valuation practitioners and officers from various agencies, to share their expert opinions, field experiences, and professional judgment that might not be captured through surveys or document reviews. The interviews were conducted with all 21 respondents during a discussion session with participants of the Valuation of Heritage Properties course held in Melaka (see Table 5), coupled with 14 organisations that participated in the interview session, thus collectively providing a total of 21 respondents. The highest number of respondents originated from two (2) governmental agencies, namely Jabatan Tanah & Survei Sarawak (four (4) respondents) and Dewan Bandaraya Kota Kinabalu (three (3) respondents), with the remaining 12 organisations each contributed either one (1) or two (2) respondents, thereby representing a variety of governmental bodies (Majlis Bandaraya Pulau Pinang and Majlis Perbandaran Sepang), an academic institution [Universiti Teknologi MARA (UiTM) Seri Iskandar], a prominent utility company (Tenaga Nasional Berhad), and a diverse group of private firms, wherein numerous of the above were recognised as real estate firms, such as Knight Frank Property Management Sdn Bhd and Rahim & Co International Sdn Bhd. Collectively, the interviews sought to gather the respondents' viewpoints regarding practical weaknesses in valuation practices in Malaysia, benchmarking optimal practices, and offering suggestions for the necessary valuation guidelines for heritage properties in Malaysia. The participants consisted of officers from federal governmental agencies, state government, universities, and the private sector.

Table 5: Respondents for Semi-Structured Interviews

No.	Organisation	Number of Respondents
1.	Jabatan Tanah & Survei Sarawak	4
2.	Dewan Bandaraya Kota Kinabalu	3
3.	Majlis Bandaraya Pulau Pinang	1
4.	Majlis Perbandaran Sepang	1
5.	Universiti Teknologi MARA (UiTM) Seri Iskandar	1
6.	Knight Frank Property Management Sdn. Bhd.	2
7.	JFF Associate Sdn. Bhd.	1
8.	Jordan Lee & Jaafar (M'CCA) Sdn. Bhd.	1
9.	Rahim & Co International Sdn. Bhd.	2
10.	IVPS Property Consultant Sdn. Bhd.	1
11.	Mohd Nor & Partners (Kajang Sdn. Bhd.)	1
12.	Tenaga Nasional Berhad (Property Services Department)	1
13.	JAZ International Malaysia Sdn. Bhd.	1
14.	Azmi & Co. (Johor)	1
	Total	**21**

3.2 Focus Group Discussion (FGD)

The FGDs were conducted in this study to bridge the methodological gap in valuing government-owned heritage buildings, wherein conventional market-based data were scarce or non-existent. As such, the above approach allowed the current researchers to elicit expert perspectives, collective reflections, and professional consensus from a multidisciplinary group, including valuers, architects, and policymakers, to address the conceptual complexity and intangible values,

namely, historical, aesthetic, and symbolic, inherent in heritage properties. By engaging stakeholders across regions, such as Melaka and Penang, the FGDs facilitated the identification of practical challenges and the validation of the cost approach as a defensible framework for accrual accounting under MPSAS 17. In essence, the qualitative method was essential for developing a standardised and multidisciplinary framework, which could help balance financial accountability with the cultural stewardship of Malaysian public assets. Moreover, the FGD approach was chosen for its ability to elicit in-depth perspectives, collective reflections, and professional consensus among practitioners, policymakers, and technical experts who were involved in property valuation and heritage management. Table 6 illustrates the composition of 48 respondents who participated in the FGD sessions across Melaka, Penang (conducted via a hybrid mode), and the virtual platform. Specifically, a total of 15 participants participated in the Melaka session, 19 attended the Penang session, and 14 joined online, which represented a diverse range of agencies, including federal ministries (Ministry of Finance (MOF), Ministry of Tourism, Arts, and Culture Malaysia (MOTAC), Jabatan Akauntan Negara Malaysia (JANM), Ministry of National Unity (KPN), National Heritage Department (JWN), local authorities, heritage organisations, universities, professional valuers, conservation specialists, and international organisations, such as the International Council on Monuments and Sites (ICOMOS) Malaysia. The largest contributor was the JPPH, namely, nine (9) participants across all sessions, followed by MLP Valuation Sdn. Bhd. with five (5) respondents, whereas other agencies contributed between one (1) and four (4) representatives, which reflected a broad degree of institutional involvement in the management process of heritage assets of the country.

Three (3) FGDs were conducted at different heritage-rich states, namely, Melaka, Penang, and online platforms, to capture regional variations in heritage valuation practices and administrative frameworks. Accordingly, both sessions aimed to identify challenges, gaps, and optimal practices in valuing heritage properties, particularly those under governmental ownership or protection. The discussions also sought to align relevant insights with the conceptual framework of MPSAS 17 (Property, Plant, and Equipment), which governed the recognition and measurement of heritage buildings in the public-sector accounting system in Malaysia. According to Table 7, a total of 48 participants from 25 governmental agencies and stakeholder groups participated in the FGDs conducted across three (3) modes and locations, namely, Melaka (15 participants), Penang (19 participants), and virtual or online platforms (14 participants). As a result, the FGDs gathered a diverse range of federal agencies, state-level authorities, heritage experts, valuation professionals, and industry representatives, which provided a more holistic view of issues concerning heritage asset management, valuation, and conservation practices in Malaysia.

Table 6: Summary of Respondents Composition in FGD Sessions

Agency/ Institution	Melaka	Penang	Virtual	Total
Valuation and Property Services Dept. (JPPH)	3	2	4	9
Melaka Historic City Council (MBMB)	2	-	-	2
Penang Island City Council (MBPP)	-	2	-	2
Public Works Department (JKR)	2	-	-	2
National Heritage Department (JWN)	-	4	-	4
Alor Gajah District & Land Office, Melaka	1	-	-	1
IM Global Melaka	1	-	-	1
The Heritage of Malaysia Trust (BWM)	1	-	-	1
JVV International Kota Syahbandar, Melaka	1	-	-	1
NTQT Sdn Bhd (Registered Conservator)	1	-	-	1
Centre for Conservation, Archaeology, Survey & Heritage Conservation Procedures (KASTURI), UTHM	1	-	-	1
IVPS Property Consultants Sdn. Bhd.	1	-	-	1
Wisma Rapid	1	-	-	1
Universiti Sains Malaysia (USM)	-	1	-	1
Universiti Malaya (UM)	-	1	-	1
Universiti Teknologi MARA (UiTM) Seri Iskandar	-	2	-	2

Table 6: Summary of Respondents Composition in FGD Sessions (continued)

Agency/ Institution	Melaka	Penang	Virtual	Total
PA International Property Consultants (Penang) Sdn. Bhd.	-	1	-	1
MLP Valuation Sdn. Bhd.	-	5	-	5
Henry Butcher (Penang) Malaysia Sdn. Bhd.	-	1	-	1
International Council on Monuments & Sites (ICOMOS) Malaysia	-	-	1	1
Ministry of Finance (MOF)	-	-	2	2
Ministry of Tourism, Arts and Culture Malaysia (MOTAC)	-	-	2	2
Accountant General's Department of Malaysia (JANM)	-	-	3	3
Ministry of National Unity (KPN)	-	-	2	2
Total	**15**	**19**	**14**	**48**

Table 7: Summary of Respondents' Positions in FGD Sessions

Position/ Institution	FGD 1	FGD 2	FGD 3	Total
	Melaka	Penang (Hybrid)	Virtual (Online)	
Heritage Commissioner	-	1	-	1
District Valuer	1	-	-	1
Valuer (Government)	3	2	4	9
Valuer (Private)	4	7	-	11
Conservation Architect	2	-	1	3
Planner (Senior Assistant Director)	-	1	-	1
Assistant Architect	-	1	-	1
University's Lecturer	1	5	-	6
Registered Conservator	1	-	-	1
Developer	1	-	-	1
Subdistrict Head (Taboh Naning State Constituency)	1	-	-	1
Assistant Engineer	1	-	-	1
Assistant Director, Heritage Register Division, National Heritage Department	-	1	-	1
Curator	-	1	2	3
Principle/ Chief Assistant Secretary (MOF)	-	-	2	2
Accountant (Public)	-	-	5	5
Total	**15**	**19**	**14**	**48**

3.2.1 FGD 1 in Melaka

The Melaka FGD consisted of a total of 15 participants, which encompassed representatives from the local authorities (LAs), registered valuers, an architect, a lecturer, and a contractor. The session was designed to explore the issues and approaches of valuation for heritage buildings owned by the government. Key themes emerged around:

i. The lack of specific valuation standards for heritage buildings under the current MVS framework
ii. Data scarcity on heritage property transactions, restoration costs, and material sourcing
iii. The need for harmonised inter-agency collaboration between the JPPH, JWN, and LAs

iv. The importance of heritage significance assessment, combining qualitative heritage values (historical, aesthetic, and symbolic) with quantitative valuation methods

Respondents in Melaka agreed that the cost approach employed for valuing government-owned heritage buildings was suitable, while emphasising training and certification for heritage valuers, the development of a national heritage database, and the formal inclusion of heritage valuation within the MVS.

3.2.2 FGD 2 in Penang

The FGD in Penang involved a total of 19 participants, who represented various professional and institutional backgrounds, including registered valuers, LA officers, academics, architects, and governmental valuation officers. The FGD was conducted via a hybrid mode, wherein a majority of the participants attended on-site, while the remaining five (5) participants attended via a virtual platform. The participants were selected through purposive sampling, which targeted individuals with direct experience in heritage property valuation, conservation planning, or policy formulation, with discussions focused on:

i. The practical challenges in applying conventional valuation methods to heritage properties
ii. The ambiguities in existing guidelines under the MVS
iii. The requirement for an integrated multidisciplinary approach, which incorporated historical, architectural, and legal dimensions

The key findings revealed that practitioners in Penang primarily relied on a combination of market and cost approaches, which were adapted with heritage-sensitive adjustments. The respondents also highlighted the absence of standardised national guidelines and limited databases for heritage property transactions, which hindered consistent valuation practices. Numerous participants advocated for capacity-building through continuing professional development (CPD) training consisting of certified heritage valuation training and the creation of a centralised heritage property database to help contribute to higher degrees of transparency and comparability for the FGD in Penang.

3.2.3 FGD 3 (Online)

The online FGD comprised a total of 14 participants representing key federal governmental agencies and stakeholders involved in the management process of heritage assets. Conducted virtually, the session effectively engaged officers from the MOTAC, JANM, KPN, ICOMOS, and representatives from the JPPH. The online format enabled a broader rate of participation from governmental agencies located beyond the physical FGD venues, thus ensuring higher levels of inclusivity and more holistic representation. In sum, their contributions offered valuable insights on policy alignment, financial reporting, cultural governance, and valuation practices, hence complementing the FGD results gathered from the Melaka and Penang sessions.

3.3 Data Collection and Analysis

Each FGD lasted approximately 90 to 120 minutes and was moderated by the researcher with assistance from two (2) note-takers. All discussions were audio-recorded with participants' consent before being transcribed verbatim subsequently. The thematic analysis was employed to identify recurring patterns, which were categorised into four (4) major themes:

i. Conceptual understanding of government-owned heritage buildings
ii. Practical challenges in valuation and data availability
iii. Institutional and legal constraints
iv. Recommended methodological adaptations

Triangulation was achieved by comparing and cross-referencing the results from each FGD with the documentary analysis of valuation standards, national heritage legislation, and MPSAS reporting guidelines, which established the substantial linkages between interview findings, FGDs, and document analysis and guaranteed that the proposed valuation framework was both legally compliant and practically feasible.

3.3.1 Identifying Practical Gaps and Challenges

The document analysis of the MVS and MPSAS 17 initially revealed a lack of specific and detailed guidelines for government-owned heritage buildings, which often led to the use of a nominal RM1 value in accounting records. To address the above legislative gap, semi-structured interviews and FGDs provided critical on-the-ground evidence of the systemic weaknesses faced by practitioners. Although the documents stipulated the broad parameters, the primary data from interviews and FGDs highlighted the reliance on subjective estimation and the urgent requirement for a standardised framework to replace inconsistent practices.

3.3.2 Validating the Methodological Shift

The document analysis of Accrual Accounting Policies highlighted that assets should be measured at cost or a nominal value of RM1 if the cost was impractical to determine (Accountant General's Department of Malaysia, 2025). Nevertheless, the results from the FGDs in Melaka and Penang established a professional consensus that the nominal approach was insufficient for modern financial accountability and asset stewardship, hence leading to a linkage where interview insights regarding professional judgment were utilised to justify adapting the cost approach, namely, a method recognised in documentation for specialised assets to specifically reflect the reproduction and conservation burden of heritage buildings.

3.3.3 Developing the Valuation Formula

The proposed valuation formula represented the final incorporation of technical data from documents and qualitative adjustments from expert discussions, wherein the document analysis provided the objective technical base, such as the cost data of the Public Works Department (JKR), which were subsequently linked to the findings from the FGDs, which identified the necessary Heritage Factors (adjusting costs by 50 to 70%) and additional specialist labour costs (15 to 35%) required for rare materials, such as chengal wood or lime plaster. The interview findings further validated the separation of land and building values, thereby ensuring the final formula would fulfil the specific requirements of accrual accounting.

3.3.4 Legal and Policy Alignment

The document analysis of the National Heritage Act 2005 (Act 645) offered the fundamental legal definitions and classifications for tangible heritage, such as monuments and archaeological sites, with the FGDs and interviews subsequently linking the above legal definitions to the practicalities of financial reporting under MPSAS 17 and IPSAS 45, thus ensuring that the proposed framework would not exist in a financial vacuum, but rather would honour the stewardship and preservation obligations that were mandated by national law and international charters.

4.0 Discussion of Findings

The current review synthesised existing scholarship on the valuation of tangible and public-owned heritage buildings and highlighted persistent methodological and institutional shortcomings. Specifically, valuing such buildings continued to be a global challenge, particularly in Malaysia, where there was conceptual ambiguity, inadequate accounting

integration, and institutional limitations that profoundly impeded consistent recognition and reporting. Moreover, the absence of a standardised heritage valuation framework, compounded by limited archival and market data, further constrained the reliable estimation of market and replacement values. According to the MVS, a valuation practice should include the purpose of valuation, the basis of valuation, the approach to valuation and adjustments of factors involved in the process of valuation. Meanwhile, for public-owned heritage properties, challenges were intensified by the need to capture service potential, restoration obligations, and non-market cultural value within financial assessments. In addition, a shortage of skilled heritage valuation professionals and the exclusion of conservation and maintenance costs from the current models contributed to inconsistencies in valuation practices, financial disclosure, and long-term policy planning within the public sector in Malaysia.

4.1 Challenges in Valuing Public-owned Heritage Buildings

The process of valuing heritage properties, particularly those owned by the government, presented complex challenges that differed substantially from conventional property valuation. Specifically, the heritage buildings embodied cultural, historical, and architectural significance that often transcended their economic functions, which suggested that their valuation was a multidimensional exercise. The results from FGDs conducted in Melaka and Penang revealed that valuers encountered numerous methodological, institutional, and technical barriers when assessing relevant buildings. The following section will outline seven (7) key challenges identified from the discussions, which reflect both systemic gaps and practical constraints within the current heritage valuation practices in Malaysia:

i. Lack of specific valuation standards for heritage buildings
ii. Ambiguity in definitions and overlapping jurisdictions
iii. Limited market and transactional data
iv. Difficulty in quantifying non-financial and cultural values
v. Legal and financial constraints related to conservation costs
vi. Absence of professional expertise among valuers
vii. Insufficient integration of aesthetic and historical significance

The process of valuing government-owned heritage properties presented complex challenges distinct from conventional valuation, as the heritage buildings held cultural, historical, and architectural significance that extended beyond economic values, thus requiring multidimensional assessments. The current results highlighted the importance of having a standardised and multidisciplinary framework to guarantee the transparent and consistent valuation process of government-owned heritage buildings in Malaysia.

4.2 Purpose of Valuation: Accrual Accounting

The main purpose of valuing heritage buildings for accrual accounting in the public sector is to ensure that government-owned cultural and historical buildings are properly recognised, measured, and reported in accordance with modern financial reporting standards, such as MPSAS 17 (Property, Plant, and Equipment) and IPSAS 45. Contrary to conventional assets, heritage buildings are held not for revenue generation, but rather for cultural identity, preservation, education, and public benefit. Nevertheless, under an accrual accounting system, all assets, regardless of their purposes, must be recorded to present a complete and transparent picture of governmental resources and stewardship responsibilities. In addition, valuation provides a quantifiable measure of the economic resources invested in the above assets, supports accountability in public expenditures, and strengthens the management of public-sector assets by helping ministries plan the budgets for maintenance, restoration, and conservation, while improving the current process of decision-making by allowing governmental agencies to compare asset conditions, prioritise funding, and justify preservation investments. Importantly, the valuation process can also support intergenerational equity, which will guarantee that the value and significance of heritage buildings will be formally documented, safeguarded, and reported for the benefit of future citizens. According to the MVS, the purpose of valuation is to provide an independent, objective, and professional opinion of the value of an asset at a specific date, based on the key characteristics of the asset, market conditions, and the intended use of the valuation. In sum, the MVS emphasises that every valuation should clearly

state its main purpose, as different purposes will influence the foundation of values, assumptions, methodologies, and reporting approaches.

Common purposes under the MVS include financial reporting, loan security, transaction (sale and purchase), compulsory acquisition, rating and taxation, insurance, asset management, statutory requirements, and litigation or dispute resolution. Hence, by defining the key purpose, the MVS will guarantee that the valuation process will reflect the actual basis of values, including the market value, fair value, and special value, apply appropriate methods, and fulfil the information needs of users, such as governmental bodies, financial institutions, corporations, or courts. Ultimately, the main purpose of valuation under the MVS is to ensure higher levels of consistency, transparency, and credibility in determining the actual value of the asset, which can allow all parties to rely on the valuation for informed decision-making. Additionally, valuing heritage buildings owned by the government in Malaysia requires a more nuanced approach that extends beyond conventional methods used for property valuation, as the heritage buildings are not only physical structures but also cultural symbols that embody the national history, identity, and architectural legacy. Owing to their unique characteristics and public significance, valuers should consider a range of factors that can more accurately reflect both tangible and intangible aspects of value. In the Malaysian context, pertinent elements such as traditional design, rare building specifications, aesthetic and symbolic value, structural integrity, and ongoing maintenance play a critical role in determining the value of heritage buildings.

4.3 Basis of Valuation: Existing Use

For government-owned heritage buildings, the appropriate basis of valuation is existing use, which has frequently been expressed in public-sector standards as the current operational value (COV) or depreciated replacement cost (DRC). Particularly, the basis recognises that heritage buildings are not held for sale, not traded in an open market, and not intended to generate commercial income, but instead serve public, cultural, administrative, and educational functions, which enables the valuation to reflect the value of the building in its present use and presumes that it will continue to provide the same level of service potential to the government and public. As heritage buildings have no active market and cannot be substituted with ordinary buildings, valuers typically adopt a cost approach, which incorporates:

i. Replacement or reproduction cost using heritage-grade materials and approved conservation methods,
ii. Restoration cost to transform the asset into its operational condition, and
iii. Depreciation adjustments, considering physical deterioration, functional constraints, and regulatory restrictions, while recognising that cultural value does not depreciate.

The above foundation will guarantee that financial reporting under public-sector standards (IPSAS 45 / MPSAS 17) will reflect the true operational importance of heritage buildings and support the transparent stewardship, budgeting, and long-term conservation planning of heritage assets.

4.3.1 Market Value (Fair Value)

Under IPSAS 45, the relevant measurement basis is fair value, which is aligned with International Financial Reporting Standards (IFRS 13). Nonetheless, for non-cash-generating public-sector assets, IPSAS 45 has often applied the COV, which is similar to existing use value in the public sector. Essentially, the market value in the IPSAS is the price that would be received to sell an asset in an orderly transaction between market participants at the measurement date. Meanwhile, heritage and public-sector assets rarely have an active market, and thus, the IPSAS allows measurement based on their continued service capacity, rather than market exchange.

4.3.2 Existing Use (COV)

In IPSAS 45, the closest equivalent to the existing use value is the COV, which represents:

> "The value of an asset to the entity, based on its current use, providing the same level of service potential."

The above definition indicates that the asset is valued not for sale, but rather for the service continued to be delivered in its present function. For heritage buildings owned by the government, the COV is typically employed, as such assets are:

i. Not held for sale
ii. Not used to generate commercial profits
iii. Preserved for cultural, educational, administrative, or public-service purposes

Although IPSAS 45 does not prescribe specific valuation methods, the COV may be estimated using appropriate valuation techniques, including the cost approach, especially replacement cost or depreciated replacement cost in situations where market and income data are unavailable (see Table 8).

Table 8: Suitability Between Market Value and Existing Use

Term	Meaning under IPSAS 45	Suitable For
Market Value/ Fair Value	Price from a hypothetical market sale between market participants	Assets with an active market
Existing Use (COV)	Value of the asset as it is used now, focusing on service delivery instead of sale	Government, public, and heritage buildings

4.4 Approaches to Valuation: Cost Approach

Pertinent approaches to valuation imply the methodology used to determine the fair market value of an asset, which is typically categorised into market, income, or cost approaches. Accordingly, the current analysis demonstrated a clear consensus that no single approach was universally suitable for valuing heritage properties when separating between land and building as required by accrual accounting, except for the cost approach, which was the primary valuation method utilised for recognising heritage buildings in the financial statements of the government under accrual accounting. The cost approach has frequently been applied, as heritage buildings rarely have an active market, are not bought or sold, and are preserved for their service potential, instead of their economic returns. Therefore, the value of the heritage buildings is based on the cost required to reproduce or replace the building, using materials, workmanship, and conservation techniques that comply with heritage regulations.

4.4.1 Reproduction Cost

The cost approach is a fundamental method in valuing heritage buildings, particularly when market evidence is limited or when assets are held for service potential rather than commercial gains. Under the current approach, valuers will assess the economic burden required to either recreate the heritage buildings in their authentic form or to construct a modern alternative that has similar functions. Particularly, replacement cost values a heritage building by estimating the current cost to construct a modern building with similar utility and service potential through contemporary materials and methods, whereas reproduction cost estimates the cost to rebuild the heritage building as a replica using original materials, craftsmanship, and architectural detailing. Although the replacement cost reflects authenticity, the method has rarely been applied, as heritage materials are scarce, restoration techniques are specialised, and costs are substantially higher. Concurrently, despite offering a more practical and cost-efficient estimate, replacement cost is not suitable when valuing a heritage building whose significance lies in its authentic materials, design integrity, and cultural identity. Therefore, heritage buildings are not valued purely for their functional utility, but rather for their historical, architectural, and symbolic attributes. Therefore, reproduction cost is selected, as it captures the true conservation burden required to preserve the original form of the asset. By estimating the cost of reconstructing the building through traditional materials, craftsmanship, and architectural detailing, the reproduction cost aligns with heritage-grade conservation principles, international charters, and national preservation standards that emphasise authenticity. Despite being more expensive and challenging due to scarce materials and specialised techniques, the approach provides a valuation that genuinely reflects the heritage significance of the building, hence rendering it the more appropriate approach for heritage buildings that must retain their original character.

4.4.2. Restoration and Conservation Cost

Heritage buildings often require specialised restoration work, with the process of valuation including:

i. Structural stabilisation
ii. Façade conservation
iii. Traditional material sourcing, including lime plaster and heritage timber
iv. Specialist labour, such as conservation architects and artisans

The above costs will guarantee that the asset is valued in a condition suitable for continued public use.

4.4.3 Depreciation Adjustments

After determining the total cost, valuers apply the depreciated replacement cost (DRC) to reflect:

i. Physical deterioration (wear and tear)
ii. Functional obsolescence (limitations due to old layouts or outdated systems)
iii. Economic obsolescence (regulatory restrictions, tourism fluctuations)

Meanwhile, cultural and land values do not depreciate, as depreciation only applies to the physical structure, instead of the heritage significance. The reasons that the cost approach is used for heritage buildings are as follows:

i. No active market exists, which suggests that the use of the market value is inappropriate
ii. Income is not generated, hence rendering the income approach unsuitable
iii. Heritage buildings are preserved for public service, rather than resale
iv. Accrual accounting requires recognising the service potential of assets, instead of their commercial value
v. Aligned with IPSAS 45 / MPSAS 17 guidance for specialised public-sector assets

In essence, in simpler terms, the cost approach will inform the government about:

> "How much would it cost today to rebuild, restore, or conserve this heritage building so it can continue serving the public?"

The approach will guarantee the asset is recorded at a value that more accurately reflects its operational importance, thereby contributing to higher transparency, more effective budgeting, and longer-term asset stewardship. In summary, the cost approach has been widely considered the most appropriate method for valuing government-owned heritage buildings in Malaysia, including museums, colonial administrative buildings, and mosques, as the approach estimates the current replacement or reproduction cost of the property and the cost to rebuild the building using materials, craftsmanship, and techniques of similar quality without depreciation, while providing a more objective and transparent valuation, especially when market or income data are unavailable. In line with MPSAS 17 (Property, Plant, and Equipment) and MPSAS 32 (Service Concession Arrangements), the above approach supports financial reporting by ensuring that the composition of heritage buildings reflects their actual restoration cost and conditions. Meanwhile, there have been challenges emerging in estimating authentic restoration expenses, as original materials and traditional construction skills may not be available in the contemporary era. Moreover, standard depreciation models are inadequate, as heritage buildings may appreciate in historical and cultural significance over time. Notwithstanding the above complexities, the cost approach remains the foundation for heritage valuation in Malaysia, which can aid in promoting stewardship, accountability, and heritage preservation.

4.5 Considerations Factors for Value Adjustment in Valuing Public-Owned Heritage Buildings

The adjustment of heritage property valuation requires multidimensional elements, which include both tangible factors (physical and structural) and intangible factors (design, aesthetic, historical, cultural, social, and legal). A valuation based solely on market data is inadequate, as it will not be effective in capturing the actual heritage significance of the heritage buildings. Accordingly, the FGD results highlighted that Malaysia should introduce a framework for national heritage value adjustment (refer to Table 9). In particular, the valuation of heritage buildings is shaped by several key factors, including distinctive architectural designs and rare traditional materials, which render restoration more expensive owing to specialised craftsmanship and sourcing challenges. Concurrently, aesthetic qualities contribute intangible cultural value, whereas larger building sizes increase maintenance needs and influence the rate of depreciation. Nationally significant buildings also hold symbolic value that can support heritage reporting even without market-based pricing, whereas structural conditions heavily influence restoration cost and remaining service potential. In addition, the overall quality of maintenance determines long-term value stability, with poor upkeep accelerating depreciation and reducing assessed worth.

Table 9: Factors and Valuation Implications Based on the Current FGDs

Factor	Description	Valuation Implication
Design	Distinctive Malay, colonial, Chinese, and Islamic architectural identities that are difficult to replicate	Unique designs raise restoration and replacement costs due to specialised materials and craftsmanship.
Building Specification	Use of rare materials, such as chengal, lime plaster, and handmade tiles, that require skilled artisans	Scarce materials increase restoration cost, and valuers must account for material replacement and conservation complexity.
Aesthetic Value	Strong visual appeal and craftsmanship that contribute to cultural pride and tourism.	Contributes to higher intangible value and may justify heritage premiums in public-sector valuation.
Building Size	Large structures necessitate higher maintenance and more complex restoration logistics.	Size affects restoration cost, depreciation, and adaptive-reuse potential.

4.6 Valuation Formula

4.6.1 Valuation formula for valuing government-owned heritage buildings:

Heritage building value = (A) Land + (B) Building

(A) Land	Land Value (based on comparison method, market value)
(B) Building	(+) New replacement building (building cost + financing cost + developer's profit
	(-) Building Depreciation
	Subject Property Value

*Source of Building Cost – JKR, JUBM & Arcadis Construction Cost Handbook, historical cost & comparable cost in the market

4.6.2 The detailed calculation in practice by the JPPH:

A) Land Value: Size (_____m²) @ market (RM____ per m²) - RM_____

B) Building Value

Construction Cost – Average Cost per Square Meter Based on JKR for the Current Year

1.	Base Price from JKR	- ____ per m²
2.	Add:Time/ Inflation Adjustment (ATHT Index)[1]	- ____ per m²
3.	Add: Location Adjustment (Locality Factor)	- ____ per m²
4.	Add: (Heritage Factors)[2] Design/ Aesthetics/ Architecture/ Building Materials/ Specifications	- ____ per m²

Additional Costs[3]

5.	Add: Piling Works	(5–10%)
6.	Add: Specialist Works	(15–35%)
7.	Preliminary Works	(5%)
8.	Add: Infrastructure / External Works	(5–15%)
9.	Add: Contribution Charges	(1–3%)
10.	Add: Management Cost	(3–5%)
11.	Add: Professional Fees	(5–7%)
12.	Add: Financial Charges	(5–8%)
13.	Add: Risk and Profit	(10–20%)

New Building Value	- ____ per m²
Less: Depreciation[4] (30%)	
Current Building Value	- ____ per m²

_____
[1] ATHT – *Angka Tunjuk Harga Tender* (JKR)
[2] (50–70%, assume 50%)
[3] Market/ Contractors' cost
[4] Depreciation based on the physical and functional conditions of the building

4.6.3 How does the Formula Operate?

The valuation of heritage properties using the cost approach requires a systematic breakdown of both land value and building value to guarantee a fairer, more transparent, and more defensible assessment, as heritage buildings often lack direct market comparables, in which valuers are required to depend on a more structured reconstruction-cost framework that can more accurately reflect the current construction prices, locality adjustments, heritage-specific design factors, and holistic contractor cost components. Subsequently, the above calculation is refined by applying appropriate depreciation to represent the actual physical and functional conditions of the building. The following sections will outline the full valuation workflow, which begins with the estimation of land value, followed by detailed components that constitute the replacement or reproduction cost of the building.

i. Land Value

The current aspect calculates the value of the land where the building is located:
- Size (m²): Total land area
- Market rate per m²: Current market price of land in that location
- Land Value = Size × Market Price per m²

The calculation will demonstrate the total market value of the bare land.

ii. Building Value

The current section estimates what it would cost to rebuild the building in the latest period by considering relevant construction specifications and heritage characteristics, and adhering to the cost data of the JKR:

a) Base Price from the JKR

The JKR publishes the average construction cost per m² for different types of buildings, which serves as the beginning point.

b) Inclusion: Time/ Inflation Adjustment (ATHT Index)

- ATHT = *Angka Tunjuk Harga Tender*
- The index adjusts historical JKR costs to reflect current-year prices, which ensures that the cost accurately reflects inflation and changes in the construction market

c) Inclusion: Location Adjustment (Locality Factor)

Costs will vary between states or cities. For instance, Kuala Lumpur is more expensive relative to a small town, which aligns the cost to the specific location of the building.

d) Inclusion: Heritage Factors (Design/ Aesthetics/ Materials/ Architecture)

Heritage buildings often include:
- Intricate design
- Special materials, such as chengal and lime plaster
- Artisanal workmanship
- Architectural uniqueness

The above aspects can increase the cost, and the typical adjustment is generally **50 to 70%**, with valuers typically using **50%**.

e) Additional Costs (5 to 13%)

Additional costs reflect the real-world construction costs of contractors, which are included as percentages of the adjusted construction cost:

- **Piling Works (5 to 10%)**

Additional foundation cost, especially for old sites or weak soil

- **Specialist Works (15 to 35%)**

For heritage buildings, repairing original features requires specialists.

- **Preliminary Works (5%)**

Site preparation, temporary structures, and safety measures

- **Infrastructure or External Works (5 to 15%)**

External drains, roads, landscaping, and utility connections

- **Contribution Charges (1 to 3%)**

Fees or statutory contributions to local councils

- **Management Cost (3 to 5%)**

The administrative and project management costs of a contractor

- **Professional Fees (5 to 7%)**

Architect, engineer, QS, and heritage consultant

- **Financial Charges (5 to 8%)**

Interest or financing costs during construction

- **Risk and Profit (10 to 20%)**

Contractor's margin and allowance for uncertainties

f) New Building Value

After including all the above components together, the cost to revamp the heritage building in the latest period will be obtained.

g) Less: Depreciation (30%)

The current aspect accounts for:
- Physical deterioration
- Functional obsolescence
- Age
- Wear and tear

For heritage properties, depreciation may vary depending on the conditions.

h) Current Building Value

This is the final building value after depreciation, which represents the actual value of the existing structure in the latest period.

5.0. Conclusion

According to the results gathered from the FGDs, it was recommended that Malaysia should conduct valuation for the heritage buildings owned by the government rather than using the nominal value of RM1 in the accounting record, wherein a combination of the market approach and the cost approach to value land and buildings was considered to be the most suitable method to value government-owned heritage buildings. Specifically, the market dimension represents the economic aspect of heritage valuation, which is supported by comparable sales data, whenever available, especially for land value, whereas the cost approach concentrates on reproduction and conservation expenses, which are adjusted for depreciation to reflect the reproduction value of the asset. To strengthen the levels of accuracy and cultural sensitivity, the valuation process also includes heritage significance assessments, which will help guarantee that both tangible and intangible values are appropriately recognised to determine the fair value. Concurrently, the cultural heritage aspects, which are incorporated into the asset value through the intangible aspects such as aesthetic, historical, and symbolic significance, are considered for adjustments. Nevertheless, the present study comprises several key limitations, primarily owing to the data scarcity regarding heritage property transactions, restoration costs, and specialised material sourcing in Malaysia, which have compelled valuers to highly depend on subjective estimation and professional judgment, thereby limiting the accuracy and comparability of valuations across various governmental agencies. Additionally, estimating reproduction costs has become increasingly complex due to the obsolescence of traditional construction techniques and the rarity of authentic materials, including chengal wood. The above technical barriers have also been exacerbated by methodological inconsistencies in the current standards, such as MPSAS 17 and MVS, which do not provide sufficiently detailed guidelines for quantifying intangible cultural, social, and symbolic values. As such, future researchers should focus on the development of a national heritage database to centralise information on conservation costs and heritage property transactions, thereby enhancing transparency and consistency. There is also a critical need to investigate refined depreciation models that can simultaneously account for both physical wear and the potential appreciation of cultural significance in the long term. Moreover, future studies should explore incorporating qualitative scoring tools or cultural value indices to more accurately showcase intangible benefits in financial reports, with other vital topics, including assessing the impact of climate change on the structural integrity and maintenance costs of heritage buildings in tropical environments and standardising heritage significance assessments aligned with international references, also being accounted for.

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Digital Audit Readiness in the Malaysian Public Sector: A Conceptual Framework Integrating Organisational Readiness and Commitment Theories

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Abstract

Purpose: The current paper aimed to review the existing literature on digital audit implementation and to develop a conceptual framework of organisational readiness, which encompasses the antecedents of readiness for change, measures of readiness for change, change-related effort, and the outcomes of change, for digital audit implementation in the public sector.

Design/ Methodology/ Approach: This paper was based on a review and synthesis of the existing literature on readiness to implement digital audits in the public sector. Specifically, a systematic search across major academic databases and institutional sources covering the period from 2000 to 2024 was conducted to identify relevant publications, with the proposed conceptual framework grounded in the theory of organisational readiness for change (Weiner, 2009) and complemented by the three-component model of organisational commitment (Allen & Meyer, 1990).

Findings: The proposed conceptual framework connected antecedents of organisational readiness, collective work commitment, and outcomes of digital audit implementation and highlighted how motivation, capability, and organisational support could contribute to higher degrees of readiness and work commitment, ultimately leading to improved audit quality, effectiveness, and accountability in the digital transformation process.

Practical Implications: Using the framework in gathering empirical evidence could offer practical guidance for public-sector audit institutions, especially the National Audit Department (NAD), to assess digital audit readiness, identify barriers, and design targeted interventions, such as training, communication, and resource allocation. Concurrently, the framework assisted in fostering collective work commitment and guaranteeing more effective and accountable digital audit transformation in the public sector.

Originality/ Value: The proposed conceptual framework incorporated Weiner's theory of organisational readiness for change and Allen and Meyer's (1990) three-component model of commitment to develop a holistic conceptual framework in explaining auditors' readiness for digital audit implementation in the public sector in Malaysia.

Keywords: Digital transformation, digital audit, public sector, organisational readiness, work commitment.

1.0 Introduction

In the modern era, digital transformation has emerged as a defining force in reshaping institutions across all sectors, including governmental auditing. In the Fourth Industrial Revolution (IR 4.0) era, public-sector organisations have increasingly been expected to modernise existing systems, enhance efficiency, and promote transparency through digital technologies, with digital audit, which is defined as the use of digital technologies, tools, and techniques to support and deliver audit work (Audit Scotland, 2017), emerging as a strategic mechanism to improve the current levels of quality, timeliness, and relevance of public-sector audits. Internationally, the transition towards digital auditing has also gained momentum, particularly among Supreme Audit Institutions (SAIs) in Europe, Asia, and the Americas, wherein artificial intelligence (AI), data analytics, and cloud computing have been incorporated into existing auditing functions (INTOSAI, 2023). Nonetheless, the readiness of public-sector institutions to adopt and sustain digital audit practices remains a critical challenge, particularly in developing countries where resource limitations, legacy systems, and human resistance have often impeded digital transformation. Meanwhile, in Malaysia, the digital agenda of the government is guided by long-term strategies, such as the MyDigital Economy Blueprint (2021–2030) and the Malaysia Plans, which collectively aim to accelerate digital adoption and strengthen governance through technology-driven reformations. The NAD, which functions as the supreme audit institution of Malaysia, plays a vital role in guaranteeing satisfactory levels of transparency, accountability, and integrity in public-sector financial management. By recognising the importance of digitalisation, the NAD has outlined a Digital Strategic Plan (2021–2025) to help improve audit efficiency through data analytics and secure information systems.

Despite the above initiatives, existing empirical evidence has indicated that progress in public-sector digital audit implementation remains modest, owing to the presence of relevant issues, such as insufficient infrastructure, limited staff competency, and resistance to change, thereby restricting the required level of readiness (Mokhtar et al., 2024; Nik Man, 2024), which are similar to the broader issues of digital unreadiness in the Malaysian public sector, wherein technology investments have not frequently been translated into more effective digital transformation (Ramli et al., 2017; OECD, 2024). Organisational readiness for change, which refers to the shared belief among members that the organisation is both willing and able to implement change (Weiner, 2009), has widely been recognised as a determinant of successful transformation. In the digital audit context, readiness reflects not only the availability of technical resources but also the psychological and behavioural preparedness of auditors to embrace change. Furthermore, existing studies have demonstrated that when employees perceive their organisations as ready for change, the employees tend to exhibit higher levels of commitment and proactive engagement, which will subsequently enhance performance outcomes (Qureshi et al., 2021; Zappalà et al., 2019). Conversely, lower degrees of readiness often manifest as resistance, reduced morale, and poor implementation outcomes (Oreg, 2003; Vakola, 2014). Hence, assessing the antecedents and outcomes of organisational readiness is key to having a deeper understanding of how the NAD can effectively transition to digital auditing.

In the current study, the extant literature on digital audit implementation was reviewed to propose a conceptual framework by incorporating two (2) key theoretical perspectives, namely the theory of organisational readiness for change (TORC) (Weiner, 2009) and the three-component model of organisational commitment (TCM) (Allen & Meyer, 1990). Particularly, the proposed framework could offer a more holistic understanding of how organisational and behavioural factors would interact to influence the levels of readiness, commitment, and ultimately audit effectiveness and public accountability. Therefore, the present investigation would contribute to the growing discourse on public-sector digitalisation by synthesising existing knowledge, identifying key gaps, and proposing an integrated conceptual model tailored to the context of public-sector audit transformation in Malaysia. The current paper is structured into seven (7) sections, which begin with an overview of the research methodology in Section 2, with the subsequent three (3) sections reviewing the related literature on digital transformation and digital audit, public-sector auditing, the role played by the NAD, and organisational readiness for digital audit. Section 6 introduces the proposed conceptual framework, whereas the final section concludes this paper by identifying key research gaps, providing directions for future studies, and outlining the theoretical and practical implications of the proposed framework.

2.0 Methodology

The current study adopted a qualitative and conceptual research design, which aimed at reviewing and synthesising existing literature to develop an integrated theoretical model of auditors' readiness to implement digital audit in the public

sector. Owing to the limited empirical research on the current topic, especially in the context of developing countries, a conceptual review approach was deemed appropriate to consolidate dispersed knowledge and establish a foundation for future empirical inquiry (Torraco, 2016; Snyder, 2019).

2.1 Literature Search and Selection

A literature search was conducted across major academic databases, including Scopus, Web of Science (WoS), Emerald Insight, and Google Scholar, complemented by institutional documents from the International Organisation of Supreme Audit Institutions (INTOSAI), the International Federation of Accountants (IFAC), and the NAD of Malaysia, with keywords used in various combinations, including digital audit, public sector audit, organisational readiness, digital transformation, and auditors' commitment. In particular, the search focused on peer-reviewed publications and reports from 2000 to 2024 to capture the evolution of digital auditing and organisational readiness in the digital era, with the inclusion criteria as studies addressing (1) technological or organisational transformation in auditing, (2) with determinants of readiness or behavioural change, and (3) in public-sector or institutional settings, whereas exclusion criteria eliminated purely technical studies and those unrelated to audit or organisational change. After screening and evaluating relevance, approximately 90 sources, including journal articles, institutional papers, and policy documents, were retained for synthesis.

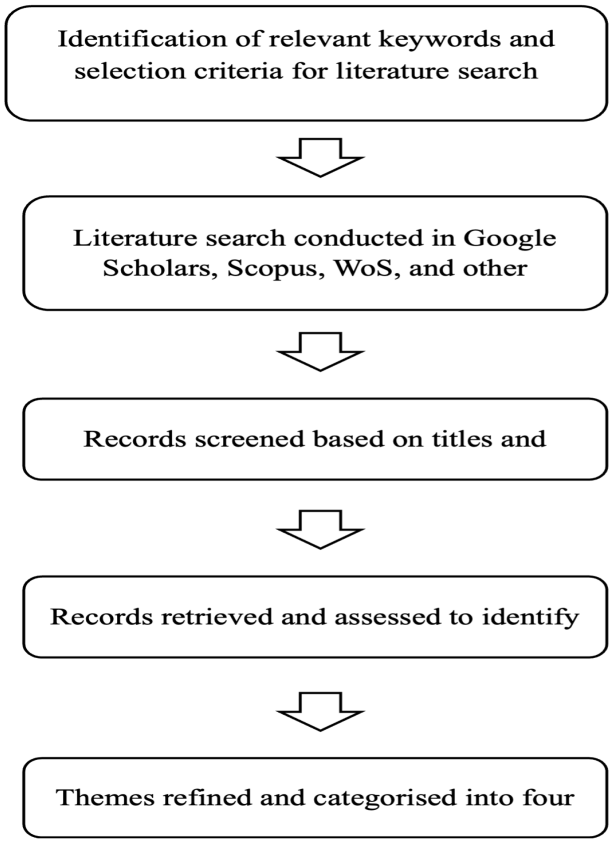

Figure 1: Research Review Procedures

2.2 Analytical and Synthesis Approach

The analysis adhered to an integrative literature review method that allowed for the combination of diverse theoretical and empirical perspectives (Webster & Watson, 2002), wherein the selected literature was organised into four (4) thematic domains, namely, (1) digital transformation and auditing, (2) organisational readiness for change, (3) auditors' behavioral and affective commitment, and (4) outcomes of audit effectiveness and accountability. Subsequently, a

thematic synthesis approach was used to identify relevant patterns, relationships, and theoretical linkages across the above four (4) domains (see Figure 1). To construct the conceptual framework, key perspectives from the reviewed literature were systematically aligned with two (2) foundational theories, namely, Weiner's (2009) TORC and Allen and Meyer's (1990) TCM, which were guided by theoretical triangulation to guarantee sufficient conceptual coherence and explanatory strength.

3.0 Digital Transformation and Digital Audit

3.1 Digital Transformation: Concept and Evolution

Digital transformation has emerged as a defining paradigm in the modernisation process in both the public and private sectors. Generally, digital transformation refers to the integration of digital technologies into all areas of an organisation, fundamentally changing how the organisation operates and delivers value to various groups of stakeholders. The Organisation for Economic Co-operation and Development (OECD, 2019) described digital transformation as the economic and societal effect of digitisation and digitalisation, while emphasising how pervasive technologies will substantially reshape industries, services, and citizen behaviour. Vial (2019) expanded the above definition by framing digital transformation as a process that "triggers significant changes to an entity's properties through combinations of information, computing, communication, and connectivity technologies" (p. 121). Collectively, the above definitions converge on the understanding that digital transformation is not merely the automation of manual processes but an organisational rethinking of culture, operations, and governance through technology.

In the past decade, technological breakthroughs, such as AI, robotic process automation (RPA), big data analytics (BDA), and cloud computing, have accelerated digital transformation. Specifically, in the private sector, the above technologies have revolutionised supply chains, customer relations, and decision-making processes (Henriette et al., 2016; Gimpel et al., 2018), whereas in the public sector, digital transformation aims to enhance efficiency and transparency (Fatine et al., 2025). Nevertheless, digitalisation in governmental settings entails distinct challenges, due to the presence of bureaucratic structures, rigid regulations, and accountability constraints (Mergel et al., 2019; Otia & Bracci, 2022). Therefore, successful transformation in the public sector requires not only technological innovation but also cultural and structural adaptation. The coronavirus disease (COVID-19) pandemic further highlighted the requirement for digital transformation, in which remote operations, data-driven decision-making, and online service delivery became critical imperatives across various governments worldwide, with numerous public-sector institutions accelerating digital initiatives during the above period to maintain the continuity of services and to guarantee accountability (Agostino et al., 2022). Thus, the above crisis-driven transformation provided valuable lessons about agility and resilience in public administration, thereby establishing the foundation for more strategic and sustainable digital reformations.

3.2 Digital Transformation in the Public Sector

The digitalisation of public-sector institutions has been a central focus of governance reformations globally since the early 2010s. Specifically, governments in the United States (U.S.), the United Kingdom (UK), and the European Union have established specialised digital units and policies to institutionalise technology-driven service delivery. For instance, the U.S. Digital Service and the Federal Cloud Computing Strategy, which were introduced in 2011, represented a shift towards more agile and user-centred digital governance (Mergel, 2016), whereas the UK Government Digital Service (GDS) transformed public administration through open data, citizen-centric design, and standardised digital infrastructure (Cordella & Paletti, 2019). Meanwhile, across Europe, the eGovernment Action Plan 2016–2020 and Digital Europe Programme (2021–2027) sought to harmonise digital governance and cross-border interoperability (European Commission, 2020), whereas in Asia, Singapore emerged as a key model of digital government through its Smart Nation initiative, which incorporated digital identity, e-payments, and data analytics into governance processes (Ha & Chuah, 2023). Similarly, the Digital Government Development Plan (2020–2022) in Thailand and the Indonesia's Electronic-Based Government System (SPBE) Roadmap in Indonesia highlighted regional efforts to improve transparency and citizen engagement through information and communications technology (ICT) systems (ASEAN, 2021).

The public-sector digital transformation in Malaysia evolved through successive national strategies, which began with the Electronic Government (e-Gov) Initiative in 1997 and the Public-Sector ICT Strategic Plans (2006–2015), followed by the introduction of the Public Sector Digital Transformation Plan (2016–2020) and the MyDigital Blueprint (2021–

2030) under the Malaysia Digital Economy Corporation (MDEC, 2021), which reflected the long-term commitment of the government to institutionalising digital governance. The above initiatives focused on developing integrated systems, such as ePerolehan (procurement), Human Resource Management Information System (HRMIS), and cloud infrastructure, through MyGovCloud. Nevertheless, despite extensive planning, existing research has suggested that the digital transformation in the Malaysian public sector remains uneven, especially in terms of limited adoption of advanced technologies across ministries (Ramli et al., 2017; OECD, 2024). The UN E-Government Development Index (2024) also ranked Malaysia 57th globally, which indicated a decline from 47th in 2020 and challenges in implementation and citizen participation. Although the current literature concentrating on the digital transformation in Malaysia has focused on e-government and citizen-facing services (Ismail et al., 2024; Sani & Jaafar, 2025), there have been limited studies examining the transformation in accountability institutions, such as audit bodies. According to Mergel et al. (2019), oversight institutions are critical for ensuring adequate integrity and trust, and this area of study remains understudied in the current landscape of digital governance research, thereby highlighting the importance of examining how SAIs, including the Malaysian NAD, have conceptualised and operationalised digital transformation.

3.3 The Rise of Digital Audit

Digital audit represents a substantial evolution in auditing practices, which is mainly driven by the increasing availability of digital data and analytical tools. Historically, auditors employed computer-assisted auditing tools (CAATTs) to analyse datasets and support manual procedures (Handoko et al., 2020). Comparatively, recent developments in data analytics, blockchain, and AI have redefined audit processes, which have enabled continuous monitoring, predictive analysis, and automated risk detection (Issa et al., 2016; Kokina et al., 2025). Accordingly, the European Court of Auditors (2020) denoted digital audit as the use of digital technologies, such as process mining and text analytics, to help improve the levels of audit quality and efficiency, whereas Audit Scotland (2017) offered a broader view by describing digital audit as “the use of digital technology, tools, and techniques to support and deliver audit work” (p. 5). In practice, digital audit incorporates technologies across all stages of auditing, which range from planning and risk assessment to evidence evaluation and reporting. Existing studies have demonstrated that digital audit tools can aid in improving data reliability, reducing audit lag, and supporting real-time oversight (DeSimone et al., 2020; Butkė & Dagilienė, 2022). In the public sector, digital audit can support more transparent and accountable financial management by allowing auditors to process large volumes of data across various ministries and agencies (Eulerich et al., 2023). Meanwhile, successful adoption requires auditors to develop higher levels of digital competencies and confidence in managing complex datasets, which indicates a challenge that has often been highlighted in the existing literature (Yoon et al., 2015; Maldonado et al., 2020). Globally, several SAIs have institutionalised digital audit laboratories and innovation hubs to build such capacity. For example, the European Court of Auditors established ECALab, whereas the U.S. Government Accountability Office (GAO) created an Innovation Lab to experiment with AI and blockchain for audit analytics (U.S. Government Accountability Office, 2025). Similarly, in Asia, the Board of Audit and Inspection in Korea and the Auditor-General’s Office in Singapore have implemented the divisions of data analytics to more effectively support continuous auditing (IFAC, 2022), which demonstrates the strategic role played by digital audit in strengthening accountability through data-driven evidence.

3.4 Digital Audit Implementation in Malaysia

In Malaysia, the NAD has gradually adopted digital tools to contribute to higher degrees of audit efficiency. Particularly, the Digital Strategic Plan 2021–2025 identified four (4) strategic pillars, namely, (1) the integration of digital services and data, (2) strengthening ICT infrastructure and security, (3) ICT governance, and (4) capability development (NAD, 2022). Nonetheless, existing empirical research has indicated that digital audit readiness remains at an early stage (Mokhtar et al., 2024), owing to several key challenges, including inadequate infrastructure, limited AI training (with related courses scheduled only in 2025), and a lack of coherent change management strategies (Nik Man, 2024), with local studies also reflecting similar findings. For instance, O’Connor et al. (2025) highlighted the adaptive shift of Malaysia to digital and remote auditing amidst pandemic challenges, whereas Sudradjat et al. (2024) demonstrated that the digital competency and efficacy of auditors could profoundly contribute to a higher level of audit judgement quality. In essence, both studies above emphasised the importance of readiness, skills, and technology capabilities as key drivers for more effective digital audit implementation. In addition, Ismail et al. (2024) developed a model of digital audit readiness for public-sector auditors, yet also noted that readiness would not automatically translate into successful

implementation. Collectively, the above studies revealed that only having technology investment would be insufficient without corresponding organisational readiness, leadership commitment, and behavioural alignment.

The current literature has consistently exhibited that while digital transformation and digital audit can introduce substantial benefits, such as enhanced efficiency, data-driven decision-making, and real-time accountability, their effectiveness mainly depends on organisational readiness and human factors. In particular, in the Malaysian public sector, digital transformation efforts remain constrained by structural rigidity, capacity limitations, and uneven digital literacy, wherein existing empirical studies have uncovered that auditors' readiness for digital audit is scarce, with most focusing on technology adoption rather than the organisational and psychological dimensions of change. Therefore, the present study situated the readiness of auditors within the broader framework of organisational change and emphasised the interplay between antecedents, such as change valence, task knowledge, and resource availability, readiness to change, and outcomes, including collective work commitment, audit effectiveness, and public accountability. The following section will explore the theoretical foundations underpinning the above interaction by referring to Weiner's (2009) TORC and Allen and Meyer's (1990) TCM to develop an integrated model to have a deeper understanding of digital audit readiness in the public sector.

4.0 Public Sector Auditing and the National Audit Department

4.1 Evolution of Public Sector Auditing in Malaysia

Public-sector auditing in Malaysia has evolved concurrently with the political, economic, and administrative development of the nation. The audit function originated during the British colonial administration in the early 1900s, which primarily served to guarantee satisfactory degrees of financial compliance and safeguard colonial interests (Allen & Donnithorne, 1954). Accordingly, the establishment of audit offices in the Federated Malay States and the appointment of W.J.P. Hume as the first Auditor General in 1906 formalised the institutional foundation for governmental auditing (Mat Daud, 2007). Following independence in 1957, the enactment of the Audit Act 1957 signified a critical milestone, which transferred accountability from the colonial government to the Parliament, wherein the Act legally empowered the Auditor General to examine and certify public accounts to ensure the propriety and legality of public expenditures. Over time, amendments to the Audit Act, notably in 1978, 1982, and 2024, expanded the audit scope from financial compliance to performance and governance auditing, which reflected the commitment of the government to transparency and effective governance (Mat Daud, 2007; Audit Act Amendments, 2024). From the 1980s onwards, the auditing function in Malaysia commenced to incorporate broader assessments of economy, efficiency, and effectiveness, namely, the 3Es, which aligned with global trends promoted by the INTOSAI. In sum, the above reformations symbolised a key transition from transactional verification to value-for-money auditing, thereby positioning the audit function as an essential pillar of public-sector accountability.

4.2 The Mandate and Function of the National Audit Department

The NAD serves as the SAI in Malaysia, which is mandated under Article 105 of the Federal Constitution and governed by the Audit Act 1957. The core responsibility of the NAD is to conduct financial, compliance, and performance audits of all federal and state ministries, statutory bodies, and local authorities. Specifically, the Auditor General, who is appointed by the Yang di-Pertuan Agong upon the advice of the Prime Minister and after consultation with the Conference of Rulers, reports directly to the Parliament through the Public Accounts Committee (PAC), which guarantees the independence of the audit function from the executive branch of government. Under Section 5(1) of the Audit Act 1957, the main duties of the NAD include:

i. Examining and certifying the financial statements of the Federation and states;
ii. Auditing statutory bodies and government-linked companies receiving public funds; and
iii. Reviewing the management and performance of public programmes to ensure sufficient compliance, efficiency, and accountability.

In addition to the above statutory functions, the NAD will conduct specialised audits, such as Corporate Governance Management Audits (CGMA) and follow-up audits, to assess corrective actions employed by different ministries and

agencies. Currently, the department oversees over 500 auditable entities, including 27 federal ministries, 13 state governments, and numerous local authorities (Buang, 2015). Concurrently, the independence and authority of the NAD are safeguarded by the Constitution, which stipulates that the Auditor General may not be removed from office except by the Federal Court and that remuneration cannot be altered to the officer's disadvantage during tenure, which are essential for maintaining the impartiality and credibility of public audits.

4.3 Digital Transformation Initiatives of the National Audit Department

By recognising the requirement to modernise audit processes, the NAD has progressively incorporated ICT into existing operations, with the Digital Strategic Plan 2021–2025 of the department seeking to attain four (4) main strategic goals, namely, incorporating audit data across various ministries via a centralised platform, guaranteeing stable and securing various technological systems, developing standards for digital audit processes, and improving the digital skills and literacy of auditors (NAD, 2022). The above strategic priorities are aligned with the broader MyDIGITAL Blueprint and 12th Malaysia Plan, which emphasise strengthening digital governance and improving public sector efficiency. Additionally, the department has begun incorporating data analytics and visualisation tools to help improve audit reporting and risk assessment. For example, the Auditor General's Dashboard was launched to increase transparency by offering public access to audit summaries and performance metrics (Mohamad Zam et al., 2021). Nonetheless, the impact of the dashboard was limited due to low user engagement and incomplete disclosure of follow-up actions, hence demonstrating the transition to digital auditing of the NAD as sluggish and fragmented, with existing studies also highlighting ongoing constraints in technological infrastructure, human capital, and organisational culture (Mokhtar et al., 2024; Nik Man, 2024; Syam et al., 2025). Accordingly, the postponement of AI-related training until 2025, namely, four (4) years after the introduction of the National AI Roadmap (MOSTI, 2021), has illustrated the gap between policy aspirations and institutional readiness, coupled with resource shortages and procedural rigidity.

4.4 Challenges and the Need for Readiness

The digital transformation of the NAD is not merely a technological endeavour but also an organisational change process, which requires clear vision, strong leadership, and staff commitment. Past research on change management in the public sector emphasised that the success of digital initiatives depended heavily on the readiness of an organisation, which included its collective confidence, motivation, and capability to execute change (Weiner, 2009; Cinite et al., 2009). Focusing on the NAD, the limited availability of key resources, resistance to emerging technologies, and lower degrees of digital proficiency among auditors have also emerged as key barriers (Veerankutty et al., 2018), thus suggesting that organisational readiness extends beyond technical competence to psychological and cultural preparedness. Particularly, when employees believe their organisations are capable and committed to change, the employees are more inclined to exhibit higher levels of work engagement and accountability (Qureshi et al., 2021), whereas a lower level of perceived organisational readiness can lead to higher resistance and inefficiency, coupled with reduced audit quality (Ungku Mohd Zam et al., 2021). Thus, assessing and strengthening readiness among auditors is essential for ensuring that the digital transformation of the NAD can achieve its intended goals of improving audit effectiveness and public accountability.

Although the NAD possesses a strong legal mandate and strategic direction for digital transformation, existing institutional foundations are insufficient to guarantee successful digital audit implementation, as the transition towards digital auditing is highly contingent upon the willingness, confidence, and preparedness of auditors to adopt emerging technologies and develop relevant digital competencies. As such, the human factor becomes a critical determinant of the success of transformation, particularly when resistance to change and limited digital proficiency may substantially hinder implementation efforts. Therefore, beyond policies and technological investments, understanding the organisational and psychological readiness of auditors is essential for achieving sustainable digital audit transformation, which highlights the importance of organisational readiness for change. The following section will elaborate on the concept of organisational readiness for change by discussing theoretical foundations, determinants, and significance in digital audit implementation.

5.0 Organisational Readiness for Digital Audit

5.1 Concept of Organisational Readiness for Change

Digital transformation, particularly in the domain of public-sector audit, requires more than the acquisition of technology, which demands more holistic organisational readiness. Specifically, organisational readiness for change refers to the shared psychological and behavioural state within an organisation that reflects the commitment of organisational members to implement change and their confidence in successfully executing it (Weiner, 2009), which represents both a cognitive and motivational construct that encompasses the collective belief that change is necessary, desirable, and feasible (Armenakis & Harris, 2009; Holt et al., 2007). Contrary to individual readiness, which mainly concentrates on personal attitudes toward change, organisational readiness represents a group-level construct that reflects the overall alignment of beliefs, resources, and systems to support digital transformation (Shea et al., 2014). Accordingly, a higher level of organisational readiness can enhance the persistence and cooperation of organisational members during the process of change, whereas a lower degree of readiness will contribute to higher resistance, conflict, and implementation failure (Vakola, 2014). Additionally, in the context of digital audit implementation, readiness encapsulates the ability and willingness of an organisation to adopt digital tools, restructure audit workflows, and embrace alternative competencies, which necessitates the incorporation of technological infrastructure, leadership support, and employee engagement. As emphasised by Gong and Ribeire (2021), successful digital transformation depends on both 'hard' factors (systems, data, and technology) and 'soft' factors (culture, trust, and motivation). Hence, in the public sector, where hierarchical rigidity and bureaucratic procedures often prevail, organisational readiness will function as a critical bridge between technological potential and operational reality.

5.2 Relevance of Readiness in Digital Audit Transformation

In the digital audit context, readiness will determine whether auditors and their institutions can shift from traditional manual approaches to embracing data-driven audit techniques, as digital audit requires auditors to navigate more complex datasets, utilise analytical software, and interpret AI-generated insights, which are tasks that demand digital skills, technical skills, and cognitive adaptability (Issa et al., 2016; Kokina & Davenport, 2017; Ismail et al., 2025). Hence, without adequate degrees of readiness, auditors may experience more technological anxiety, distrust in digital tools, and reluctance to change established practices. Moreover, public-sector auditing has a unique set of challenges related to readiness, with bureaucratic structures often delaying decision-making, resource allocation being tightly controlled, and the workforce potentially being accustomed to stable and rule-bound procedures (Michelotto & Joia, 2024), which demonstrates that readiness-building is a strategic imperative. In a similar vein, existing studies in developing countries have revealed that the failure of digital audit initiatives is not owing to inadequate technology, but rather due to limited human and organisational preparedness (Limani et al., 2019; Afroze & Aulad, 2020). In the context of the Malaysian NAD, readiness issues are also evident in terms of limited training, resource shortages, and resistance to different audit systems (Nik Man, 2024).

5.3 Relationships Between Readiness, Commitment, and Outcomes

Organisational readiness does not operate in isolation, but rather interacts with behavioural and performance outcomes. According to the current empirical studies, it has been indicated that a high level of organisational readiness can contribute to higher employee commitment, which will subsequently drive effectiveness and accountability (Madsen et al., 2006; Zappalà et al., 2019). In the NAD context, the readiness of the institution to adopt digital systems can help strengthen the collective work commitment of auditors, namely, a shared sense of responsibility and emotional attachment to the stipulated organisational goals (Allen & Meyer, 1990). When auditors perceive that the NAD is prepared and capable of digital transformation, the auditors are more predisposed to align personal efforts with institutional objectives, thus leading to more efficient audit practices and improved public accountability (Nasrabadi & Arbabian, 2015; Lestari et al., 2020). Conversely, when the level of readiness is low, auditors may exhibit minimal engagement, which will subsequently contribute to reduced performance (Jaya et al., 2024). As such, organisational readiness acts as a precursor not only to effective digital implementation but also to stronger professional commitment and institutional trustworthiness through the embodiment of both psychological commitment and practical capability, thereby guaranteeing that technological innovations are supported by a motivated and competent workforce. Accordingly, the main factors influencing readiness

are change valence, task knowledge, and resource availability, which collectively determine the extent to which digital audit initiatives can be embedded and sustained within audit institutions, including the NAD.

6.0 Theoretical Foundations and Conceptual Framework Development

6.1 Theory of Organisational Readiness for Change (TORC)

The TORC, which was introduced by Weiner (2009), provides a holistic explanation of how collective psychological states can influence organisational capacity to implement change by positing that readiness is a shared and emergent property, and it exists not within individual employees, but rather within the collective belief system of organisational members. According to Weiner (2009), readiness is determined by two (2) key constructs, namely, change commitment and change efficacy, in which the former refers to the collective determination or resolve to pursue change, representing the motivational aspect of readiness and reflecting whether members prefer to implement change. Meanwhile, change efficacy is denoted as the collective belief in the capability of an organisation to execute the change effectively, which embodies the cognitive and confidence-based components and reflects whether members believe that they can implement change. In addition, both components interact dynamically, wherein a higher change commitment without efficacy may result in enthusiasm without execution, whereas higher efficacy without commitment will lead to technical capacity, yet lower motivation. Therefore, readiness requires both a strong desire to change and confidence in the ability to execute change (Weiner, 2009; Shea et al., 2014). Weiner (2009) further identified three (3) primary antecedents influencing readiness, namely, change valence (the perceived value of the change), task knowledge (understanding of what should be performed), and resource availability (the perceived adequacy of time, funding, and expertise). When the above antecedents are favourable, organisational members tend to develop shared perceptions that support readiness, which can subsequently enhance change-related effort and outcomes of the change initiative. Similarly, numerous empirical studies have validated the above relationships across different sectors, including healthcare, education, and the public service (Holt et al., 2007; Cinite et al., 2009; Zappalà et al., 2019). In the digital audit context, Weiner's (2009) theory provided a pertinent perspective for examining the transformation journey of the NAD, wherein the readiness of the department to implement digital audit depends not only on its access to digital infrastructure but also on the collective motivation and perceived capability of auditors to employ relevant tools effectively. Thus, the TORC captures the organisational psychology underlying digital transformation and explains the reasons that certain institutions embrace change successfully, whereas others stagnate, despite similar technological resources.

6.2 Three-Component Model (TCM) of Organisational Commitment

Although readiness can explain why organisations will initiate change, commitment explains how members can sustain effort and engagement during the process. In particular, Allen and Meyer's (1990) TCM offers a behavioural and emotional complement to the readiness construct by delineating the three (3) dimensions of employee commitment:

i. **Affective Commitment:** The emotional attachment to, identification with, and involvement in the organisation. Employees with strong affective commitment remain owing to personal preferences.
ii. **Continuance Commitment:** The awareness of the costs associated with leaving the organisation, and employees stay as they are required to.
iii. **Normative Commitment:** A sense of obligation to remain with and support the organisation, and employees stay as they feel they ought to

The above multidimensional view of commitment recognises that organisational behaviour is driven by diverse motivational foundations, including emotional, calculative, and moral (Allen & Meyer, 1996). Prior empirical evidence demonstrated that affective commitment was most strongly associated with positive work behaviours, innovation, and performance, whereas continuance commitment could lead to passive compliance, and normative commitment would sustain ethical responsibility (Meyer et al., 2002; Jaya et al., 2024). In the public sector, particularly in institutions such as the NAD, commitment can lead to broader implications. Specifically, auditors' commitment reflects not only loyalty to organisations but also adherence to professional ethics and accountability to the public. Existing studies have also uncovered that committed auditors tend to uphold independence, apply judgment consistently, and engage proactively in the processes of reformation (Lestari et al., 2020; Nasrabadi & Arbabian, 2015). Therefore, fostering stronger affective

and normative commitment among auditors is vital for the successful institutionalisation of digital audit practices. In sum, incorporating Weiner's (2009) TORC and Allen and Meyer's (1990) TCM assisted the current study in formulating a holistic theoretical framework for understanding the human and organisational dynamics of digital audit readiness, which was grounded in the premise that readiness would act as an antecedent to commitment, and commitment would mediate the relationship between readiness and performance outcomes (Holt et al., 2007; Qureshi et al., 2021), thereby allowing a deeper understanding of how readiness would translate into tangible organisational outcomes through the mediating influence of commitment.

6.3 Conceptual Framework of Auditors' Readiness for Digital Audit

To examine the digital audit implementation by the NAD in Malaysia, the present study proposed a conceptual model that linked the antecedents of organisational readiness, namely, change valence, task knowledge, and resource availability, with readiness measures, collective work commitment, and outcomes (Weiner, 2009):

i. **Change Valence:** When auditors perceive digital audit as valuable and beneficial to their work, they are more inclined to commit to its implementation (Bilgiç & Camgöz Akdağ, 2023).
ii. **Task Knowledge:** Understanding the tasks and processes involved in digital audit can enhance self-efficacy and readiness (Salijeni et al., 2019).
iii. **Resource Availability:** Adequate infrastructure, training, and leadership support can help reinforce confidence in the organisational capacity to change (Otia & Bracci, 2022).

The above antecedents profoundly shape how organisational members assess both their motivation (change commitment) and capability (change efficacy) to perform a change (Weiner, 2009). After readiness has been established, it will influence the development of collective work commitment among auditors, in which a higher degree of readiness will foster affective commitment (emotional attachment to the change), normative commitment (sense of duty to support it), and, to a lesser extent, continuance commitment (recognition of costs of non-compliance). Similarly, existing empirical studies support the above linkage, wherein readiness predicts positive work attitudes and organisational identification (Holt et al., 2007; Qureshi et al., 2021). Subsequently, collective work commitment influences the outcome of the audit, which includes audit effectiveness and public accountability. In summary, the conceptual framework, as visualised in Figure 2, connected the antecedents, namely, change valence, task knowledge, and resource availability, with organisational readiness, collective work commitment, and change outcomes in digital audit implementation by the Malaysian NAD, which highlighted how motivation, capability, and organisational support could enhance readiness and work commitment, ultimately leading to improved audit quality, effectiveness, and accountability in the process of digital transformation.

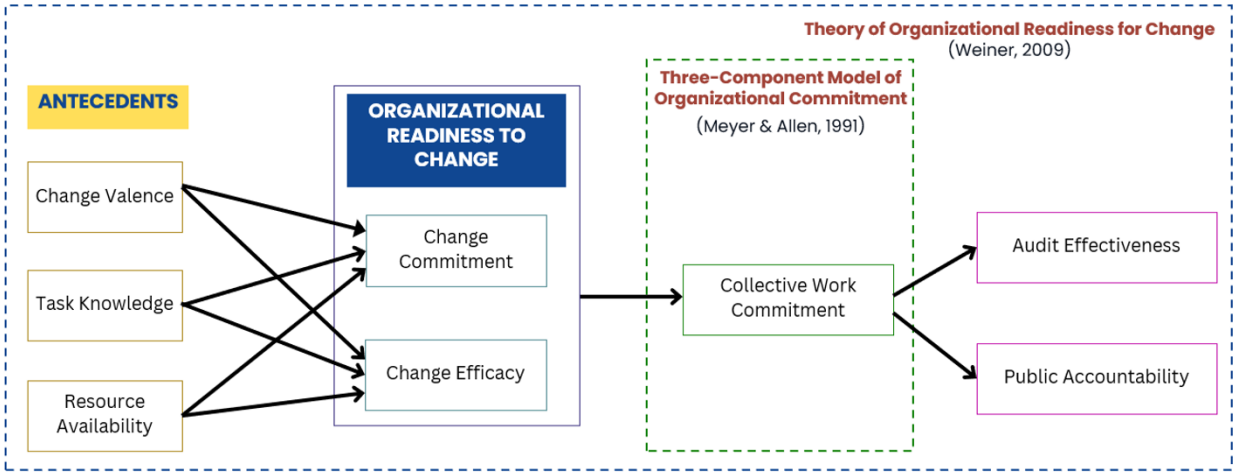

Figure 2: The Conceptual Framework

7.0 Research Gaps, Directions for Future Research, and Implications of the Integrated Model

Although digital transformation has been widely examined across various industries, the current body of knowledge on digital audit readiness, particularly within public-sector contexts, remains limited and fragmented, as existing studies have predominantly emphasised the technological and procedural aspects of audit digitalisation, such as tool adoption, data analytical integration, and automation, rather than the human and organisational dimensions that will determine the success of implementation (Salijeni et al., 2019; Butkė & Dagilienė, 2022). In addition, there is a conceptual gap in linking technological innovation to organisational behavior, wherein although existing models, such as the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT), have frequently been used to explain individual technology adoption, the above models cannot adequately capture the collective psychological readiness required for the digital transformation across all levels of the organisation (Venkatesh et al., 2012; Gong & Ribeire, 2021). As such, the TORC (Weiner, 2009) can help bridge the above gap by focusing on shared beliefs, motivation, and confidence, yet its application in public-sector auditing remains sparse. There is also an empirical gap in existing studies that have examined the interrelationships between readiness, commitment, and performance outcomes, in which prior research on digital transformation in auditing was often limited to identifying the determinants of adoption (Ismail et al., 2024) without extending analysis to how readiness would influence the behavioural commitment and audit quality of auditors. Consequently, the mechanisms through which readiness will translate into improved accountability remain underexplored. Additionally, most empirical evidence on digital audit readiness originates from Western audit institutions, wherein resource sufficiency, digital infrastructure, and governance maturity are relatively more advanced (Eulerich et al., 2023; IFAC, 2022). In contrast, developing countries, such as Malaysia, have frequently encountered unique challenges, including bureaucratic rigidity, limited funding, and uneven digital competency, that shape organisational readiness differently. Thus, testing and refining existing theories within the Malaysian NAD context can offer opportunities to contextualise and extend the current theoretical frameworks.

In terms of theoretical and methodological gaps, the incorporation of Weiner's (2009) TORC with Allen and Meyer's (1990) TCM in the current study was novel in the audit digitalisation literature, although there was an absence of empirical validation of the above integrated model, as a majority of prior studies regarded readiness as a unidimensional construct, which neglected the dynamic interaction with commitment and performance outcomes, hence highlighting the need for multilevel and longitudinal research to capture temporal changes in readiness and commitment during digital transformation. Future researchers can expand the scope of digital audit readiness beyond technical adoption to include behavioural, cultural, and ethical dimensions, while appraising how organisational justice, ethical climate, and leadership communication can mediate the linkage between readiness, commitment, and performance. Furthermore, comparative studies across SAIs in Southeast Asia can further enrich the current understanding of how regional governance structures will influence organisational readiness. Practically, the integrated model developed in this paper could function as a diagnostic tool for audit institutions, wherein the NAD and other SAIs could utilise the model to assess different levels of readiness, identify relevant barriers, and design targeted interventions, such as capacity-building programmes, leadership workshops, and change management strategies. Moreover, embedding readiness assessment into digital audit policy frameworks can help guarantee that transformation efforts are human-centred, inclusive, and sustainable. In terms of the proposed conceptual model, the incorporation of the TORC and TCM contributed to several important implications, in which the proposed model advanced the existing literature on digital audit by combining the change readiness theory and organisational behavioural theory that rarely intersect in public-sector studies, thereby offering a deeper understanding of how psychological and institutional factors would jointly influence technological transformation. Future empirical studies are also encouraged to employ and validate the proposed conceptual framework to provide further evidence and enhance its generalisability.

In terms of practical implications, the model can guide the leadership of the NAD in diagnosing readiness gaps, designing interventions (training, communication, resource allocation), and fostering commitment among auditors. By recognising the dual role played by readiness and commitment, the NAD can manage both technical and behavioural aspects of digitalisation. Specifically, the resource availability component of the proposed framework is particularly relevant in addressing the current capability gaps within the digital transformation efforts of the NAD, as although the NAD has initiated several digitalisation strategies, the postponement of AI-related training indicates that institutional readiness remains constrained by existing limitations in specialised digital competencies and training preparedness. Therefore, resource availability should be perceived not only in terms of technological infrastructure and financial support, but also in the provision of continuous professional development, AI-related training, and organisational learning opportunities

for auditors, which requires strengthening the above resources to further increase the self-assurance, change efficacy, and preparedness of auditors to more effectively implement digital audit practices. For policymakers, the model reflects the importance of human-centred digital transformation strategies, wherein developing only digital infrastructure is insufficient, as there is also a need to cultivate readiness and commitment among auditors to ensure more sustainable outcomes of the reformation. In conclusion, the current integrated framework not only enriched the current theoretical discourse but also offered practical guidance for relevant institutions, including the NAD, which sought to navigate the complex process of digital audit implementation. Concurrently, the Malaysian government has laid a robust foundation for the smooth and effective implementation of its digital transformation agenda, particularly within public-sector auditing. As a result, the proposed conceptual framework provided a structured pathway to enhance the level of readiness for the effective implementation of digital audits, thereby contributing to the overall success of the digital transformation agenda of the government.

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Sustainability Reporting Framework for the Public Sector in Malaysia

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Abstract

Purpose: The current study aims to develop a sustainability reporting framework, which is tailored to the public sector in Malaysia, to help address the current major constraint, namely, the absence of a standardised and appropriate framework of sustainability reporting in the local context.

Design/ Methodology/ Approach: By employing a qualitative research design, relevant data were collected mainly through documents, including relevant international sustainability standards, policy papers, and institutional reports, supported by the results gathered from semi-structured interviews conducted with practitioners, with the data analysed via content and thematic analysis.

Findings: A proposed framework, which enabled the processes of systematic tracking, management, and reporting of sustainability initiatives and related expenditures by public institutions, in line with the Sustainability Development Goals (SDGs) and associated indicators, was discussed.

Originality/ Value: The proposed framework was developed and tailored to the Malaysian public sector, which was unique in terms of the core services and management structures, and it was anticipated to contribute to higher levels of transparency and accountability across ministries, while allowing existing policymakers and stakeholders to more effectively monitor and evaluate the contributions of the public sector to sustainable development, thereby fostering continuous institutional improvement

Keywords: Sustainability reporting framework, public sector, Sustainable Development Goals, corporate social responsibility

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This article is part of a research on *Pembangunan Kerangka Pelaporan Kemampanan Holistik Sektor Awam di Malaysia* through *Geran Penyelidikan Perakaunan dan Kewangan Sektor Awam Tahun 2025* (JANM.600-20/1/7 Jld. 2 (40)).

1.0 Introduction

In the contemporary era, sustainability has emerged as a central global priority, and Malaysia has demonstrated a strong commitment through the incorporation of all 17 SDGs into its national development agenda and the establishment of a Prime Minister–led SDG Council. Nonetheless, despite the above initiatives, sustainability reporting within the public sector in Malaysia remains underdeveloped, fragmented, and lacking standardisation, which necessitates the government to ensure sufficient transparency in demonstrating how public resources can contribute to sustainable development outcomes, owing to its role as a public institution accountable to the citizens. Conversely, sustainability reporting in the corporate sector has been highly developed and increasingly standardised, with 96% of the largest companies across the globe reporting on sustainability (KPMG, 2024), supported by established frameworks, such as the Global Reporting Initiative, International Sustainability Standards Board, and Task Force on Climate-related Financial Disclosures (Cho et al., 2015; Ehnert et al., 2016; Junior et al., 2014; Kolk et al., 2008; Kolk, 2003; KPMG, 2011, 2013, 2015, 2017, 2020, 2024).

Despite the above frameworks, they have primarily been designed for the private sector and are not fully suited to the public sector context, wherein reporting must integrate policy objectives, budget allocations, and societal outcomes. Although the International Public Sector Accounting Standards Board (IPSASB) is currently developing public sector-specific sustainability reporting standards (IPSASB, 2025), the processes remain in the phase of exposure draft, hence creating a gap in practical guidance. Furthermore, existing empirical evidence has highlighted the current weaknesses in sustainability disclosures in the public sector, wherein it has been demonstrated that having higher degrees of alignment and standardisation across frameworks can profoundly reduce reporting costs and enhance cross-border comparability (Cheng et al., 2023; Stubbs & Higgins, 2018), yet such alignment remains insufficiently developed in numerous national contexts. In addition, a critical disparity persists in the incorporation of sustainability reporting frameworks into national policy systems, especially when more effective sustainability governance requires alignment across ministries, governmental agencies, and local authorities, particularly through the inclusion of SDG indicators into the current processes of policy planning, budgeting, and monitoring mechanisms (Sachs et al., 2019), which is inadequate in developing countries, owing to existing institutional capacity and data infrastructure being underdeveloped (Biermann et al., 2017). Concurrently, there are inconsistencies in the commitment of the government, which range from genuine strategic integration to rhetoric SDG washing, thus undermining the credibility and effectiveness of sustainability reporting (Bennich et al., 2020).

In the Malaysian public sector context, sustainability reporting practices have constantly been influenced by institutional, stakeholder, and legitimacy pressures, with both internal governance capacity and external policy demand shaping relevant adoption (Wong et al., 2019). Despite the above drivers, there remain substantial challenges, including low-quality disclosures, particularly in environmental reporting, risks of greenwashing due to unverified voluntary disclosures, and technological limitations that impede further stakeholder engagement (Solikhah & Maulina, 2021). Midin et al. (2017) and Che Ku Kassim et al. (2019) also revealed lower levels of transparency and stakeholder engagement in sustainability reporting in the public sector, with only approximately 30% of such disclosures accessible through local governmental websites. Although Malaysia has adopted cash-basis IPSAS with potential progression towards accrual accounting, sustainability reporting has remained mainly voluntary, fragmented, and inconsistent across different public-sector entities (Abdul Latif et al., 2023).

Owing to the above limitations, there is a clear and urgent requirement to develop a more holistic framework of sustainability reporting, which is tailored to the Malaysian public sector, by aligning financial, environmental, and policy performance dimensions to enhance transparency, accountability, and decision-making. As highlighted by prior research, an integrated public-sector sustainability reporting framework could assist in addressing fragmentation and guaranteeing more holistic accountability in sustainability governance (Siew, 2017). Therefore, in the current study, the main objective was to investigate the current state of sustainability reporting in the Malaysian public sector, while formulating an integrated sustainability reporting framework that aligned financial and policy performance with national sustainability priorities by specifically emphasising SDGs to contribute to higher degrees of transparency and accountability.

2.0 Review of Literature

The current section provides a holistic review of the relevant literature to establish the foundation for the following discussion, which begins by tracing the evolution of sustainability reporting and highlighting its transition from a voluntary corporate social responsibility activity to a more formalised and institutionalised practice across various sectors, before examining key frameworks and standards that have guided sustainability reporting globally, including those applicable to both private and public sectors. Subsequently, the discussion will consider the structure of budgetary expenditures in Malaysia by emphasising how public-sector financial management is related to sustainability initiatives. As such, the present review not only contextualises the current study within the existing body of knowledge but also identifies gaps and challenges, particularly in the approach employed by the Malaysian public sector to sustainability reporting and budget tracking.

2.1 Evolution of Sustainability Reporting

Sustainability reporting has gained increasing prominence as businesses and organisations worldwide have commenced aligning respective strategies with the SDGs. From 2015 onwards, sustainability reporting practices have evolved profoundly, namely, from voluntary and standalone disclosures to more structured, regulated, and institutionalised processes embedded within existing corporate governance frameworks (Hahn & Kühnen, 2013; Cho et al., 2015). Initially driven by stakeholder pressures and societal expectations, sustainability reporting currently reflects growing demands for higher levels of transparency, accountability, inclusivity, and adherence to global sustainability commitments, especially the SDGs and net-zero targets (Eccles & Krzus, 2018; Ioannou & Serafeim, 2017). In Malaysia, the public sector has performed substantial efforts in advancing sustainability reporting, owing to the influences from international trends, national policy directives, and increasing calls for transparent governance (Ramli et al., 2020). Specifically, both federal and certain local governmental bodies, statutory agencies, and government-related organisations have begun publishing Voluntary National Reviews (VNR) and Voluntary Local Reviews (VLR) as part of their commitment to sustainable development (UNDP Malaysia, 2022).

Several critical challenges persist, notably in standardising reporting practices, ensuring accountability, integrating impact measurement, and adopting a holistic approach, which are mainly due to the absence of a unified national framework (Hashim & Sulaiman, 2019; Abdul Rahman et al., 2021). Additionally, there have been a range of obstacles, including insufficient technical expertise, the lack of tailored indicators relevant to the public-sector context, limited institutional capacity, and inadequate integration of financial and non-financial reporting systems (Noor et al., 2022; Mohamad & Aziz, 2023), in embracing globally accepted sustainability frameworks among existing public-sector entities in Malaysia, such as the Global Reporting Initiative (GRI), Task Force on Climate-related Financial Disclosures (TCFD), Integrated Reporting (IR), and standards stipulated by the International Sustainability Standards Board (ISSB). Contrary to private corporations, which are often driven by market incentives and investor pressures to enhance Environmental, Social, and Governance (ESG) disclosures, public-sector organisations frequently lack comparable motivators, hence resulting in more sluggish progress towards more comprehensive sustainability reporting (Milne & Gray, 2013; Schaltegger & Burritt, 2018).

Despite the extensive development of sustainability reporting frameworks, the current literature has remained largely fragmented and corporate-oriented, with limited attention offered to the incorporation of financial management systems and policy outcomes within the public sector. Specifically, there is a lack of frameworks that explicitly connect budget allocation, expenditure tracking, and sustainability performance measurement systematically, especially in the Malaysian context, wherein sustainability reporting practices remain voluntary and disconnected from core public financial management processes. Thus, there is an urgent requirement for a more contextualised and inclusive sustainability reporting framework that can more effectively guide Malaysian public-sector institutions towards more consistent, credible, and effective sustainability disclosures. In the current review, Sustainability Reporting Frameworks are investigated, and key issues and gaps in the existing literature are also highlighted, with the specific sustainability reporting needs of public-sector accountants to enhance transparency and accountability in the public domain also discussed.

2.2 Sustainability Reporting vs SDG Reporting

Sustainability reporting and SDG reporting are closely related, yet conceptually distinct. Particularly, sustainability reporting broadly focuses on disclosing the ESG performance of an organisation, which is guided by various global frameworks to help improve transparency and comparability (Stubbs & Higgins, 2018; Cheng et al., 2023), whereas SDG reporting emphasises the alignment of organisational activities and outcomes with the United Nations (UN) by linking reporting to national and global development priorities. In the Malaysian context, SDG reporting has been more prominently adopted in the public sector, as it aligns with the commitment of the government to the UN SDG agenda, whereas ESG-oriented sustainability reporting has been more commonly practised in the private sector (Sachs et al., 2019; Biermann et al., 2017; Bennich et al., 2020). In the public sector, the above distinction is critical, as organisations are accountable not only for internal sustainability performance but also for delivering policy outcomes. Nonetheless, in Malaysia, SDG reporting practices remain fragmented, largely voluntary, and uneven in quality, owing to the constant influences from both institutional and stakeholder pressures (Wong et al., 2019; Solikhah & Maulina, 2021; Abdul Latif et al., 2023). In sum, SDG reporting can be regarded as a subset of sustainability reporting that concentrates on policy and developmental outcomes, wherein incorporating both approaches is essential to contribute to higher levels of transparency, accountability, and coherence in sustainability reporting in the public sector (Siew, 2017).

2.3 Key Sustainability Reporting Frameworks

2.3.1 The Global Reporting Initiative (GRI)

Currently, GRI Standards are highly popular and have been extensively used as a sustainability reporting framework across the world, with a focus on ESG disclosures by prioritising materiality, stakeholder inclusivity, comparability, and triple-bottom-line reporting (GRI, 2021). In particular, GRI Standards serve as a principle-based framework, yet its application is voluntary, and companies can cherry-pick disclosures and exclude certain material risks (Adams, 2020), namely, GRI Standards enable organisations to report positive and negative impacts on sustainable development through a higher degree of flexibility, yet insufficiently consider financial materiality, practise symbolic compliance, report favourable numbers, and conceal negative effects (Cho, 2023; Eccles & Krzus, 2014). Although GRI Standards can promote higher transparency, the voluntary nature prevents comparability across various sectors (Adams, 2020). Similarly, existing research has demonstrated that GRI-compliant reports have led to higher degrees of stakeholder trust and enhanced market reputation (Kılıç et al., 2019), with the main critical gap in the absence of a data accuracy verification mechanism, thereby fostering greenwashing, and excessive focus on quantity instead of quality, thus resulting in reporting overload without decision-enabling insights (Lyon & Montgomery, 2015; World Economic Forum (WEF), 2023).

2.3.2 The Sustainability Accounting Standards Board (SASB)

The SASB, which is currently consolidated under the ISSB, is centred on financially material, which provides industry-specific ESG metrics and standards that are relevant to different investors (SASB, 2023). Nevertheless, the above sole materiality priority has downplayed stakeholder concerns and reduced sustainability to a risk control mechanism rather than a societal necessity, due to its excessive focus on investors' requirements instead of stakeholder interests (Flower, 2021). Compared to GRI Standards, the SASB emphasises the economic implications of sustainability, thus appealing to the capital markets (Ioannou & Serafeim, 2019) and claiming to be able to enhance the comparability of sustainability reporting (SASB, 2023). Moreover, the ISSB consolidation of both the SASB and Carbon Disclosure Standards Board (CDSB) has been criticised as a corporate-driven attempt to evade stringent ESG requirements (Adams & Abhayawansa, 2022), which, on top of the risks of International Financial Reporting Standards (IFRS) S1/S2 of the ISSB in excluding impact materiality, allows firms to ignore negative externalities, including industry-specific metrics, thus leading to unreliable cross-industry comparisons (Barker & Eccles, 2023; Deloitte, 2023).

2.3.3 Integrated Reporting (IR) Framework

The IR Framework, which was created by the International Integrated Reporting Council (IIRC), seeks to incorporate the financial and non-financial information based on how organisations create value over time, which can contribute to a more holistic picture of performance and long-term strategy (IIRC, 2021). Existing studies have also suggested that

the framework can support decision-making and diminish information asymmetries (Eccles & Krzus, 2018). Specifically, traditional sustainability reports and GRI reports have often been employed in isolation, whereas the IR Framework prioritises strategic linkage and the inter-relationship between different forms of capital (Cheng et al., 2014). Meanwhile, there has been criticism that the framework has frequently neglected social responsibility (Flower, 2015) and also certain challenges when adopting the six (6) capitals in actual contexts and aligning the IR Framework with the SDGs (Stubbs & Higgins, 2018). Concurrently, there have been several research gaps in how to measure value creation, understand the internal governance factors, and create SDG-compatible indicators within the IR framework (de Villiers et al., 2017).

2.3.4 Task Force on Climate-Related Financial Disclosures (TCFD)

The TCFD, which was founded by the Financial Stability Board (FSB), has offered recommendations about climate-related financial disclosures, which concentrate on climate-related financial risks and encourage scenario analysis and governance disclosures (TCFD, 2017). Particularly, the TCFD has been criticised for not adequately addressing social and governance factors (Flower, 2015), although, according to the IFRS Foundation (2023), TCFD adoption in the IFRS S2 of ISSB has demonstrated a shift towards a mandatory form of climate reporting. Among several profound deficiencies of the TCFD, the most salient one is the lack of any enforcement of compliance, which indicates that it represents a type of checklist, coupled with its limited focus on key ESG considerations, including social injustice and human rights (Jamali et al., 2022). Furthermore, voluntary adoption has led to selective reporting by firms to highlight climate opportunities while downplaying potential risks (Ioannou & Serafeim, 2019).

2.3.5 Carbon Disclosure Project (CDP) and Climate Disclosure Standards Board (CDSB)

The CDP functions as a climate-focused disclosure platform, whereas the CDSB, which is currently incorporated with the ISSB, provides a framework in line with the TCFD (CDSB, 2021). The key strength of the CDP is its consistent scoring system, yet it is criticised for lacking enforcement mechanisms, coupled with other critical gaps, including no penalties for inaccurate reporting, compromising credibility, over-reliance on corporate self-reporting, and promoting selective disclosure (Lyon & Montgomery, 2015).

2.3.6 The United Nations SDGs

The SDGs, which were established by the UN in 2015, represented a universal call to action to achieve a more sustainable and equitable world by 2030 through a total of 17 goals and are supported by 169 specific targets and over 230 indicators designed to measure progress across social (people), economic (profit), and environmental (planet) dimensions (United Nations, 2015). Hence, the SDGs have provided a universal sustainability framework for governments, businesses, and organisations to align their sustainability efforts with measurable global benchmarks. Although multiple companies have adhered to the trend of the SDGs, critical research has highlighted certain key discrepancies between the purported and actual efforts. For instance, despite a 93% of the Global 250 firms mentioning the SDGs (KPMG, 2020), only a 12% have measured the impacts of firm behaviours (World Economic Forum, 2023), thereby raising concerns about SDG-washing, wherein a majority of corporations tend to favour business-friendly goals, such as SDG 8 (Economic Growth), over more socially impactful ones, including SDG 10 (Reduced Inequalities) (Alrazi et al., 2019; Alrazi et al., 2020).

2.3.7 Bursa Malaysia Sustainability Reporting Guideline

In Malaysia, Bursa Malaysia has been influential in incorporating sustainability reporting among listed firms by mandating ESG disclosure via its Sustainability Reporting Guideline and the Main Market Listing Requirements. Since 2022, all listed issuers are obliged to report profound topics related to sustainability, as underpinned by fundamental principles of governance, social issues, and environmental aspects (Bursa Malaysia, 2022). Despite being catered to the private sector, the guidelines of Bursa Malaysia can act as a useful reference for the development of sustainability reporting frameworks in the public sector, as the guidelines underpin the processes of systematic disclosures, performance indicators, and stakeholder engagement, and the framework has also been founded on globally optimal practices, such as GRI Standards and the TCFD, while incorporating local factors harmonious with national policies.

Existing studies have determined that although corporate sustainability reporting has improved in scope and consistency, there remain key areas of challenge in the assurance of sustainability data, social impact metrics, and incorporation into existing business strategies (Du Toit, 2024). Although the guidelines have helped elevate transparency in the local market, there is an absence of consistency in the quality of reporting (Du Toit, 2024), wherein numerous companies regard the guidelines merely as a compliance task, hence resulting in disclosures that have frequently been prescribed and lacking in quantitative detail (Khan et al., 2020). Furthermore, Abdul Latif et al. (2023) stated that the absence of standardised metrics in Bursa Malaysia ESG reporting led to incomparable ESG disclosures (Abdul Latif et al., 2023). In essence, although existing frameworks, such as GRI Standards, have emphasised stakeholder inclusivity and impact disclosure, and ISSB/IFRS frameworks prioritise financial materiality, none of the above has provided holistic guidance for integrating sustainability reporting with public-sector budgeting and policy performance evaluation. Similarly, SDG reporting frameworks have primarily concentrated on outcome alignment, yet lack pertinent mechanisms for associating financial inputs with measurable impacts. As such, the above fragmentation highlights the requirement for a more integrated approach, namely, combining financial traceability, policy alignment, and outcome-based reporting, particularly in the public sector.

3.0 Research Methodology

In the current study, a qualitative research design was used to develop a sustainability reporting framework for the Malaysian public sector through two (2) phases, namely, document analysis and semi-structured interviews.

3.1 Phase 1: Document Analysis

The first phase involved a holistic review of relevant documents to establish a foundational understanding of existing sustainability reporting practices and frameworks at both global and national levels. Specifically, key global frameworks that were analysed included the GRI, SASB, IR, TCFD, ISSB, IFRS, CDP, CDSB, and the UN SDG reporting guidelines. At the national level, documents reviewed included (1) Bursa Malaysia Sustainability Reporting Guideline, (2) Malaysia SDG Roadmap, (3) SDG Malaysia, (4) SDG Roadmap Phase I (2016–2020), (5) SDG Roadmap Phase II (2021–2025), (6) National Sustainability Reporting Framework (NSRF), (7) National Budget 2025, (8) UN SDG Framework and Indicators, (9) Ministry Annual Reports, and (10) official publications from the Malaysian Treasury, particularly those related to budget classification and expenditure tracking systems.

Document analysis was employed as the primary data collection method in the current phase, which involved the review and examination of relevant global sustainability reporting frameworks and national policy documents, which enabled the current researcher to interpret and contextualise existing reporting practices, policy directions, and institutional structures related to sustainability in the public sector. To analyse the collected documents, content analysis was applied as the main analytical technique, which encompassed the coding, categorisation, and comparison of textual data to identify key themes, patterns, and relationships. Specifically, in the current study, it was used to extract and synthesise the core elements of sustainability reporting frameworks, including disclosure components, indicators, and reporting structures, which allowed for a more holistic and structured examination of both the substance and context of sustainability reporting, thereby providing a more robust foundation for the development of the proposed framework. In addition, national SDG-related documents were analysed to identify sustainability-oriented expenditures, policy commitments, and gaps in current reporting practices. In addition, expenditure classifications were mapped against SDG indicators to develop a structured coding system for sustainability-related spending, with the outputs from the current phase constituting the preliminary structure and components of the proposed framework.

3.2 Phase 2: Semi-Structured Interviews

The second phase involved semi-structured interviews to validate and enrich the findings collected from Phase 1, wherein the interviews were conducted with selected representatives from three (3) ministries, namely, accountants who were directly involved in budgeting and financial reporting processes for the public sector, to gain in-depth insights into how sustainability initiatives and sustainability-related expenditures would be identified, classified, measured, and reported within the public sector. Additionally, the current phase explored practical challenges, implementation realities, and institutional perspectives that might not be evident from document analysis only. The interview data were analysed using thematic analysis based on the six-phase approach developed by Braun and Clarke (2006), which included data

familiarisation, initial coding, theme development, theme review, theme definition, and naming of themes, with the finalised themes structured into the proposed framework.

3.3 Integration and Framework Development

The findings from both phases were triangulated to ensure adequate levels of validity, depth, and comprehensiveness, wherein the incorporation of both document analysis and interview data collected from practitioners enabled the refinement and validation of the proposed framework. As a result, the above phased approach guaranteed that the developed sustainability reporting framework was both theoretically grounded and practically relevant to the context of the public sector in Malaysia. Figure 1 illustrates the current research design.

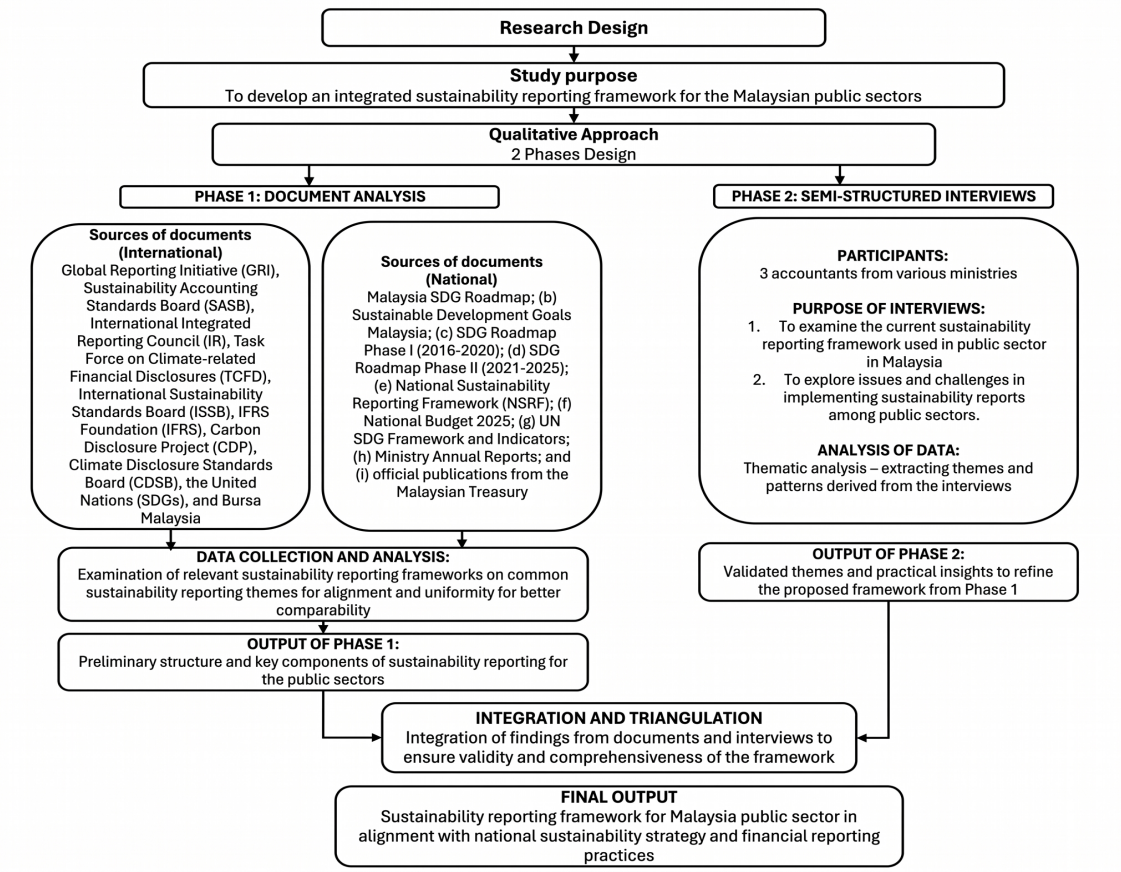

Figure 1: The Current Research Design

4.0 Findings and Discussion

The main objectives of the present study were to examine the current state of sustainability reporting in the Malaysian public sector and to develop an integrated sustainability reporting framework that was aligned with existing local sustainability practices. Specifically, the findings were grounded in document analysis and supported by interview results. In this section, the current sustainability reporting practices within the Malaysian public sector are delineated, before proposing a holistic public-sector sustainability reporting framework based on the integrated understanding of existing practices, the sustainability agenda of Malaysia, and the core elements of established reporting guidelines. In the proposed framework, financial allocations and expenditures are linked to SDG priorities with measurable outputs and outcomes, which enables a systematic evaluation of the effectiveness and efficiency of policy performance, namely, the extent to which a governmental policy achieves its intended objectives and delivers measurable outcomes aligned with national priorities, thereby strengthening transparency, accountability, and informed decision-making within the public sector in Malaysia.

4.1 Current Implementation of Sustainability Reporting in the Public Sector

It is essential to understand the current sustainability reporting practices among public-sector institutions in Malaysia, as the above practices constitute the foundation for subsequent analysis. The review of sustainability-related documents, supported by interview findings, indicated that Malaysia demonstrated a consistent commitment to SDG initiatives from 2016 onwards (SDG Roadmap for Malaysia Phase I: 2016–2020), which positioned the SDGs as the central driver of sustainability-related activities, priorities, and reporting practices within the public sector. Nevertheless, even as of 2025, a comprehensive or systematic sustainability reporting framework had not been specifically developed for the Malaysian public sector. Furthermore, most sustainability reports produced by public-sector agencies have been voluntary and are primarily aligned with the 17 SDG framework of the UN, including the VNRs, which are coordinated by the Ministry of Economy. Malaysia has published two (2) VNRs, namely, VNR 2017 and VNR 2021, and is currently preparing its third report, namely, VNR 2025. Nevertheless, the report presented aggregated data that, despite being useful for evaluating broad national performance, were of limited value for budget-related performance monitoring and detailed policy planning and implementation. Additionally, the report did not support the cost-benefit analyses of SDG-related programmes, hence rendering it difficult to assess the efficiency or impact of these initiatives, which has frequently been emphasised under the sustainability reporting guideline of the IPSAS. Figure 2 depicts VNR 2021.

SDGs Performance by Indicators

Goal 1: No Poverty

No.	Available indicators	Year	Value	Year	Value	Year	Value	Sources
1.	Households below the international poverty line (%)			2016	0.02	2019	0.01	Household Income and Basic Amenities Survey, Department of Statistics Malaysia
2.	Households below the national poverty line (%)			2016	7.6	2019	5.6	Household Income and Basic Amenities Survey, Department of Statistics Malaysia
3.	Multidimensional Poverty Index (MPI)			2016	0.0152	2019	0.0110	Household Income and Basic Amenities Survey, Department of Statistics Malaysia

Figure 2: Extract from Malaysian VNR 2021, p. 19

The above findings pinpointed the requirement for a more systematic and continuous approach to sustainability-related data collection and reporting for the public sector in Malaysia, including annual tracking of both expenditures and outcomes, which would facilitate more meaningful performance assessments and more effectively inform future policy decisions by capturing the costs incurred and benefits gained from sustainability initiatives in the long term, specifically SDGs initiatives. In addition, the lack of a systematic sustainability reporting framework in the Malaysian public sector might originate from an inadequate understanding of the sustainability or SDG components and their implementation processes among civil servants at various administrative levels, as highlighted by the current interview participants. Specifically, it was noted that the personnel responsible for implementing SDG-related activities often lacked a clear understanding of the sustainability agenda and its associated indicators:

> "...at the implementation level, many of us do not have a clear understanding, especially of the SDGs indicators and measurement. We know SDGs, but only on the surface."
>
> (Participant 1)

As a result, various departments might engage in activities that were not aligned with the intended SDG targets, wherein, in multiple cases, the departments attempted to retroactively match their existing programmes with SDG goals that were perceived as relevant, thus leading to misalignment between activities and actual SDG objectives. Consequently, the

expected outcomes and impacts of sustainability investments were not fully realised. Furthermore, the absence of standardised data collection procedures presented a substantial challenge, as indicated by one of the participants:

> "...we do collect data on our sustainability or SDGs-related activities for our ministry; however, it is limited to the activities that are relevant to our ministry...limited data on the activities. We also have some data on expenses related to the activities; however, it is not systematically reported. It is only for our internal use and will be reported when requested by the top."
>
> (Participant 2)

Another participant also highlighted the issue of a systematic procedure:

> "...for instance, data related to waste management activities are collected inconsistently across departments. While some agencies record detailed information, such as the weight and types of waste and the monetary benefits from recycling, others do not collect such data at all."
>
> (Participant 3)

Moreover, data collection efforts were not conducted consistently or systematically in the long run, as reflected in a lack of regular data recording at daily, weekly, monthly, or annual intervals, which limited the ability to generate comparable datasets and hampered evidence-based decision-making, thereby weakening the effectiveness of sustainability reporting and performance assessment. There was also limited evidence on tracing of sustainability-related expenses despite the profound effort in materialising the SDG agenda by the Malaysian government. For instance, excerpts from an annual report of a ministry revealed that the reported amount was the budget allocation for a particular SDG initiative (see Figure 2), with no information related to actual spending, which was vital for the public sector.

LAPORAN TAHUNAN KPKT 2023

Rumah Mesra Rakyat

KPKT melalui Syarikat Perumahan Negara Berhad (SPNB) telah mewujudkan program Rumah Mesra Rakyat (RMR) bagi membantu golongan berpendapatan isi rumah di bawah RM5,000 yang tidak mempunyai rumah atau tinggal di rumah usang tetapi mempunyai tanah untuk membina rumah sendiri yang sempurna dan selesa.

Sehingga November 2023, pelaksanaan RMR oleh SPNB berjumlah 13,045 unit melepasi sasaran asal RMKe-12 yang mana sasaran kumulatif pada tahun 2023 hanya 9,000 unit sahaja (3,000 unit setahun).

Peruntukan sebanyak **RM489,152,100** telah disediakan dengan sasaran sebanyak 5,845 unit pada 2023. Sehingga suku tahun keempat tahun 2023, **sebanyak 5,845 perjanjian telah ditandatangani** oleh penerima untuk memiliki RMR di seluruh negara. SPNB akan terus komited dan peka dalam usaha membantu golongan sasaran merealisasikan impian memiliki kediaman.

Figure 3: Annual Report, Ministry of Housing and Local Government
Source: https://www.kpkt.gov.my/kpkt/resources/user_1/GALERI/PDF_PENERBITAN/BUKU_LAPORAN_TAHUNAN/Laporan_Tahunan_KPKT_2023_18072024.pdf

Building on the identified gaps and challenges in the current sustainability reporting practices within the public sector in Malaysia, it was discovered that there was an urgency for a more structured and integrated approach to reporting. Accordingly, Section 4.2 will present a proposed sustainability reporting framework designed to address the above limitations and increase the alignment between financial data, policy outcomes, and SDG priorities.

4.2 Sustainability Reporting Framework for the Malaysian Public Sector

The proposed framework operationalised sustainability reporting in the Malaysian public sector by incorporating financial inputs (budget and expenditure) with SDG outcomes, thereby enabling a more systematic, transparent, and performance-oriented reporting approach (see Figure 4).

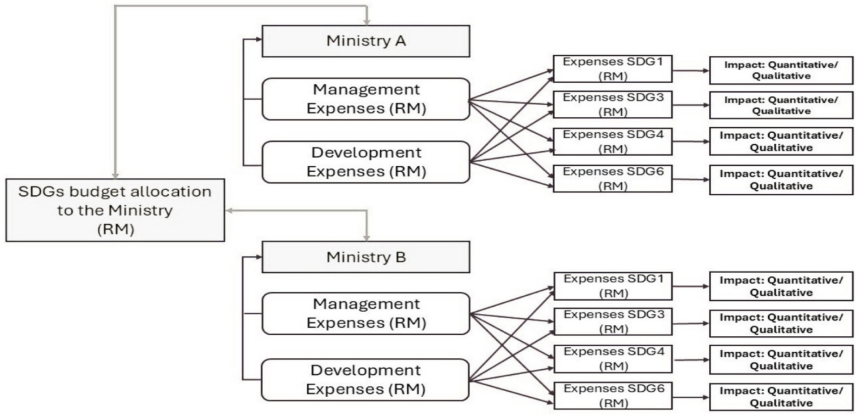

Figure 4: Sustainability Reporting Framework for the Malaysian Public Sector

At the core of the framework was the allocation of SDG-related budgets (in RM) to individual ministries, which represented the financial commitment of the government to sustainability initiatives. For instance, each of Ministry A and Ministry B received allocated funding tied specifically to SDG-related programmes and activities, and within each ministry, expenditures were categorised into two (2) categories, namely:

i. **Management Expenses (Operating Expenditure)**: Covering administrative and operational aspects and associated with particular SDG initiatives.
ii. **Development Expenses (Project Expenditure)**: Representing direct investments in SDG-related programmes, projects, and interventions.

The above two (2) categories of expenditures were subsequently and systematically mapped to specific SDG initiatives (outputs). In the proposed framework, sustainability initiatives refer to SDG-aligned activities, such as poverty reduction programmes, environmental protection initiatives, or social development projects, with each expenditure item separated to one (1) or more SDGs to ensure that financial resources would be clearly linked to sustainability objectives. Moreover, the framework extended beyond input and output tracking by linking SDG initiatives to measurable outcomes and impacts, which created a results chain, as portrayed in Figure 5.

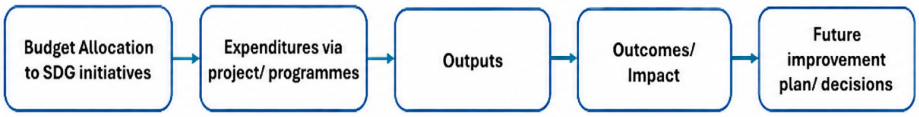

Figure 5: Financial Outcomes-based Decision-making Process

The above linkage enabled ministries to systematically track how public funds were utilised for sustainability- or SDG-related purposes by connecting budget allocations and actual expenditures to specific programmes, activities, and targeted SDG indicators, which would allow ministries not only to monitor where resources were spent but also to determine whether spending aligned with the intended sustainability priorities. Therefore, ministries would be more effectively positioned to assess the effectiveness and efficiency of sustainability initiatives, namely, whether the programmes delivered the intended outputs and outcomes and whether resources were utilised optimally to achieve maximum impacts. In addition, by associating financial data with measurable outcomes and indicators, the framework could facilitate a more holistic evaluation of the actual impact of initiatives in advancing SDG targets, which would shift

reporting from an activity- or input-based approach to a result-oriented perspective, hence fostering evidence-based decision-making, continuous performance improvement, and more strategic allocation of public resources to areas that could generate the greatest sustainability value. Additionally, the framework could enable cross-mapping, wherein a single expenditure or programme could contribute to multiple SDGs, thereby reflecting the interconnected nature of sustainability goals.

The proposed framework could address the key gaps identified in the current practices by introducing a more structured and systematic approach to sustainability reporting within the Malaysian public sector. Specifically, the framework emphasises structured and standardised data collection, wherein ministries will be guided to consistently capture data on SDG-related activities, expenditures, outputs, and outcomes using a common format, hence reducing inconsistencies across agencies and enabling the development of comparable and reliable datasets in the long term. Furthermore, the framework has established a clear linkage between financial data and SDG performance, which will guarantee that every ringgit allocated and spent can be associated with specific SDG initiatives, targets, and indicators, thus bridging the existing disconnect between budgeting processes and sustainability outcomes.

The framework can help enhance accountability through the traceability of public spending, which will allow various stakeholders to track how allocated budgets are utilised, namely, whether the funds are spent as intended, and also what results have been achieved. This level of transparency is particularly critical in the public sector, in which the justification of resource use and the demonstration of impact are essential. Moreover, the framework can support improved decision-making through outcome-based reporting by shifting the focus from merely reporting activities or budget allocations to evaluating the effectiveness and impact of SDG-related initiatives. Therefore, by providing evidence on effective aspects compared to non-effective ones, policymakers and public managers can more effectively optimise resource allocation, refine strategies, and strengthen the overall contribution of the public sector towards achieving national SDG commitments. By embedding SDGs into the budgeting, expenditure, and reporting processes, the current framework provides a holistic and integrated approach to sustainability reporting, which was tailored specifically for the public sector in Malaysia.

As an extension of the proposed framework (refer to Figure 4), the present study recommended that ministries should prepare sustainability reports aligned with the existing structure of international VNRs and adapted to the context of the Malaysian public sector. Table 1 operationalises the above by outlining key report components, including governance, strategy, stakeholder engagement, SDG performance, financial allocations, and impact assessment, which represent the core principles across established sustainability reporting frameworks, with a higher emphasis placed on budget allocation, data transparency, and outcome-based evaluation. By institutionalising the above structured and publicly accessible reporting approach, the framework can help strengthen accountability, support informed decision-making, and enhance the effectiveness of sustainability governance in Malaysia. In sum, the report should be rendered publicly accessible to researchers, civil society organisations, and the wider public to promote more informed dialogue and evidence-based policymaking.

Table 1: Proposed Contents for Sustainability Reporting in the Malaysian Public Sector

No.	Items
1.	**Opening Statement** 1.1 By the Prime Minister 1.2 By the Minister of the Ministry 1.3 By the Deputy Minister 1.4 By the Head of Divisions, Units, or Departments
2.	**Key Highlights** 2.1 Trend in achievements 2.2 Core SDG focus 2.3 Key current sustainability issue faced by the Ministry
3.	**Introduction** 3.1 About the Ministry 3.2 Core activities, vision, mission, strategic sustainability objectives, and roadmaps 3.3 Material sustainability topics 3.4 Strategy to achieve sustainability objectives
4.	**Policy and Enabling Environment** 4.1 Sustainability governance 4.2 Stakeholder engagement: Highlighting stakeholders relevant to the focus areas of sustainability of the Ministry, their concerns, and strategies to manage 4.3 Creating ownership of the SDGs
5.	**Methodology and process for the preparation of the report** 5.1 Scope and basis 5.2 Preparation of the report – data collection, analysis and reporting key themes 5.3 Key changes or lessons learned
6.	**SDG Performance: Goals and Targets, and Achievement for the Specific Ministry** 6.1 Overview 6.2 Focus SDGs: Select the relevant SDGs among the 17 SDGs 6.3 Budget allocation for SDGs initiatives by the ministry and core SDGs 6.4 Data snapshot: The current state of SDG implementation, including the amount spent. Answer the question of what do we do? 6.5 Impact: Financial and non-financial 6.6 State of sustainable development based on national indicators
7.	**Sustainable Assurances**
8.	**Conclusions and Way Forward**
9.	**Annexes** Performance and data table

5.0 Conclusion

The present study sought to examine the current state of sustainability reporting in the Malaysian public sector and develop an integrated sustainability reporting framework, which aligned financial and policy performance with national priorities, particularly the SDGs. According to the current results, it was indicated that although Malaysia has demonstrated a strong commitment to sustainability through national policies and SDG adoption, sustainability reporting practices within the public sector continued to be fragmented, voluntary, and lacking standardisation. Thus, to fulfil the above objectives, this study adopted a qualitative research design comprising two (2) phases, namely, document analysis and semi-structured interviews, wherein the former provided a deeper level of understanding of existing global and national sustainability reporting frameworks, policy directions, and reporting structures, thereby enabling the identification of key reporting components and gaps. In the second phase, semi-structured interviews were conducted with public-sector practitioners, which offered practical perspectives on implementation challenges, especially pertinent to data collection,

expenditure tracking, and the understanding of SDG indicators. As such, the proposed framework was guaranteed to be both theoretically grounded and practically relevant to the context of the Malaysian public sector.

The current results revealed several critical issues in existing practices, including a limited understanding of SDG indicators among implementers, the absence of standardised data collection procedures, inconsistent reporting practices, and weak linkages between financial allocations and sustainability outcomes. Importantly, there was minimal traceability between budget allocations, actual expenditures, and measurable impacts, which constrained more effective performance evaluation and evidence-based policymaking. In response to the above gaps, the present study proposed a sustainability reporting framework, which incorporated budget allocation, expenditure tracking, SDG-aligned initiatives, and outcome-based performance measurement within a single reporting structure and introduced a result chain that linked financial inputs to outputs, outcomes, and impacts, hence facilitating a systematic process of monitoring how public resources could contribute to sustainability objectives. By embedding SDG considerations into budgeting and reporting processes, the framework assisted in strengthening transparency, accountability, and decision-making in the public sector.

In essence, this study contributed to both theory and practice by offering a context-specific sustainability reporting framework, which was customised to the Malaysian public sector and served as a practical foundation for institutionalising structured and standardised sustainability reporting across ministries. The implementation of the proposed framework could contribute to higher levels of public-sector accountability, policy effectiveness and efficiency, and a broader commitment of Malaysia to more sustainable development. Accordingly, future researchers can consider focusing on empirical testing and cross-ministry implementation to further validate the current framework and assess the long-term impact of the framework on sustainability governance.

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Transforming Audit Practices in the Digital Era: Interview-Based Insights on Capability, Compliance, and Cultural Barriers in the Public Sector

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Abstract

Purpose: The current study investigated how digitalisation transformed internal auditing practices within the public sector in Malaysia by focusing on three (3) interrelated dimensions, namely, capability development, compliance and regulatory alignment, and cultural and organisational adaptation, seeking to have a deeper understanding of how the above dimensions could collectively shape the effectiveness and sustainability of digital audit implementation.

Design/ Methodology: This study employed a qualitative exploratory design using semi-structured interviews, which were conducted with a total of 27 internal auditors from Malaysian public-sector agencies, with the collected interview data analysed through a thematic analysis to identify recurring patterns and institutional challenges associated with digital audit transformation.

Findings: The findings revealed that digital auditing could improve audit efficiency, transparency, data accessibility, and fraud detection capabilities. Nonetheless, the transformation process continued to be constrained by limited digital competencies, inadequate practical training, fragmented regulatory frameworks, cybersecurity concerns, and resistance to organisational change, which necessitated leadership support, interdepartmental collaboration, and continuous organisational learning to sustain the effort of digital audit implementations

Originality/ Value: The present study contributed to the digital auditing literature by offering a qualitative socio-technical analysis of how capability development, regulatory alignment, and organisational culture would interact to shape digital audit transformation in the Malaysian public sector, while proposing an integrated framework linking technological readiness with institutional and cultural adaptation to support sustainable digital governance.

Practical Implications: The current results highlighted the requirement to introduce structured programmes for digital capability development, harmonised digital audit regulations, stronger cybersecurity governance, and leadership-driven cultural transformation to support sustainable digital auditing practices within the public sector in Malaysia.

Keywords: Digital auditing, internal audit, digital forensic framework, public sector, Malaysia

This article is part of a research on Digital Transformation in Public Sector Auditing: Developing a Forensic Digital Auditing Framework for Enhanced Internal Controls, Compliance and Fraud Prevention through *Geran Penyelidikan Perakaunan dan Kewangan Sektor Awam Tahun 2025* (JANM.600-20/1/7 Jld. 2 (34)).

1.0 Introduction

The digital transformation of auditing has emerged as a defining feature of contemporary governance by reshaping existing frameworks of accountability, transparency, and assurance in both public and private institutions. Specifically, the incorporation of advanced technologies, such as artificial intelligence (AI), robotic process automation, and data analytics, has revolutionised the current audit methodologies, which have enabled continuous monitoring, real-time reporting, and predictive risk assessment (Volodina & Grossi, 2024; Otia & Bracci, 2022). Moreover, the above global movement towards digital auditing has reflected a broader shift in governance paradigms by emphasising evidence-based decision-making, automation, and enhanced data integrity (Argento et al., 2025). Meanwhile, despite the potential benefits of digital transformation that have been widely acknowledged, the transition process remains uneven across regions, as it has often been shaped by the levels of institutional capacity, regulatory maturity, and cultural readiness (Betti & Sarens, 2021; Pizzi et al., 2021). Globally, public-sector institutions have begun to adopt digital tools to help improve efficiency, reduce human error, and strengthen fraud prevention, especially across developed economies, including Europe and North America, which have implemented advanced audit analytics and blockchain-embedded traceability to improve existing oversight mechanisms (Rakipi et al., 2020). Conversely, emerging economies have encountered more challenges in establishing integrated digital audit frameworks, owing to limited infrastructure and a lack of standardised policy guidance (Ahmad et al., 2023). Thus, within the above broader global evolution, Malaysia represents a profound empirical setting, owing to its ongoing efforts to modernise governance in the public sector through national digital transformation initiatives, such as the Malaysia Digital Economy Blueprint (MyDIGITAL) and the Public-Sector Digitalisation Strategic Plan, which aim to strengthen existing degrees of transparency, accountability, and administrative efficiency through technology-driven governance.

Despite increasing investments in digital infrastructure and e-governance systems, the implementation of digital auditing in the Malaysian public sector remains uneven across various public institutions, especially when numerous public-sector agencies continue to rely on fragmented legacy systems, manual audit procedures, and inconsistent digital governance practices, which have limited the effectiveness of technology-driven auditing processes and posed substantial institutional and operational challenges related to digital capability, regulatory readiness, cybersecurity governance, and organisational adaptation. Thus, Malaysia provides a relevant and timely context for examining how public-sector institutions navigate the complexities of digital audit transformation in an emerging economy. Although there have been advancements, there also remain profound challenges in developing the necessary technical capabilities and regulatory frameworks for digital auditing, as a more effective process of implementation will require a workforce proficient in data analytics, information system assurance, and cybersecurity management (Ilori, 2024; Usul & Alpay, 2025). Similar to multiple developing economies, the adoption of technology in audit practices in Malaysia has often outpaced the development of digital competencies among audit professionals. Moreover, legal frameworks governing digital evidence, data protection, and automated decision systems remain insufficiently harmonised with the latest international standard (Azizi et al., 2024), which can weaken compliance and erode confidence in digital audit outcomes, particularly when audit evidence is generated by algorithmic or AI systems (Udrescu, 2024). Therefore, capacity building and regulatory modernisation have become vital in guaranteeing that digital transformation in auditing can achieve both efficiency and accountability.

Having only technological modernisation is not sufficient to guarantee a successful digital transformation, in which the current literature has increasingly highlighted the influence of cultural and organisational dynamics in shaping the effectiveness of digital audit reformations (Betti et al., 2021; Wissal et al., 2025), Particularly, key factors, such as hierarchical structures, limited leadership commitment, and resistance to change, continue to constrain innovation in public audit environments, including in Malaysia, where public-sector institutions have historically operated within a highly procedural administrative culture. As such, cultivating a digital culture, which is grounded in trust, openness, and continuous learning, is essential to support technology adoption (Ilori, 2024), as without sufficient levels of organisational readiness and cultural adaptability, technological investment may remain underutilised, thereby hindering the broader objectives of governance reformation and digital accountability (Mokhtar et al., 2024). Accordingly, in the current study, the factors influencing the transformation of audit practices in the digital era were investigated, with a particular focus on capability, compliance, and cultural barriers in the Malaysian public sector. Meanwhile, despite the growing body of literature on digital transformation in auditing, existing studies have primarily focused on technological adoption, audit efficiency, and system implementation, with comparatively limited attention offered to the interconnected influence of human capability, regulatory alignment, and organisational culture within the public sector. Furthermore, prior research

predominantly relied on quantitative approaches and private-sector contexts, which rendered a substantial gap in qualitative evidence from emerging economies, including Malaysia, hence leading to an insufficient understanding of how institutional readiness, compliance structures, and cultural dynamics would collectively shape the sustainability of digital audit transformation among public-sector organisations. As a result, the current study could address the above gap by offering an integrated qualitative examination of capability development, compliance readiness, and organisational adaptation in the internal auditing landscape of the Malaysian public sector.

2.0 Literature Review

2.1 Conceptual Framework

The conceptual framework of the present study was theoretically grounded in institutional and socio-technical theories to explain how digital transformation in public-sector internal auditing was shaped by the interaction between organisational structures, technological systems, and human behaviour. In particular, the institutional theory posited that public-sector organisations are frequently influenced by regulatory pressures, governance expectations, and professional norms, which shape the adoption of digital auditing practices, wherein, in the Malaysian public sector, initiatives related to national digital governance and accountability requirements have generated profound institutional pressure for audit modernisation. Meanwhile, the socio-technical theory emphasises that successful digital transformation mainly depends on the alignment between technological capability, organisational processes, and human adaptation. Accordingly, the current study conceptualised digital audit transformation as a socio-organisational process shaped by the interrelationship between capability development, compliance and regulatory alignment, and cultural and organisational adaptation, which were supported by institutional and organisational theories to delineate how technological innovation would interact with governance structures and human behaviours to drive digital change (Argento et al., 2025; Pizzi et al., 2021). Contrary to previous studies that examined digital auditing primarily from technological or compliance perspectives, the present study proposed an integrated socio-technical framework that regarded digital audit transformation as an interaction between institutional capability, regulatory alignment, and organisational culture, thus extending the existing literature on digital audit by recognising that only technological implementation would not be adequate without cultural readiness and governance support.

Capability development represents the foundational elements of the current conceptual framework, which encompasses the technical, analytical, and managerial competencies that enable auditors to more effectively apply digital tools in respective audit functions. Prior research also emphasised that digital transformation would require auditors to possess advanced data analytics skills and sufficient technological literacy to maintain audit quality and efficiency (Betti & Sarens, 2021; Gökoğlan et al., 2025). Moreover, in the public-sector context, capability building should include institutional support, structured training programmes, and system integration to guarantee more sustainable adoption (Ilori, 2024; Usul & Alpay, 2025). Meanwhile, compliance and regulatory alignment, which is the second dimension of the conceptual framework, denote the institutional mechanisms that help safeguard accountability and integrity in digital auditing, which seek to address the need for relevant policies that recognise digital evidence, data governance, and ethical standards in audit operations. Similarly, existing studies have highlighted that although developed nations have codified standards for digital auditing, developing countries continue to be observed with several gaps in regulatory readiness and policy coordination (Volodina & Grossi, 2024; Otia & Bracci, 2022). In Malaysia, audit reformations have also begun to incorporate digital processes, yet the legal and procedural frameworks remain fragmented (Ahmad et al., 2023; Mustafa et al., 2024). Therefore, the above alignment is essential for legitimising digital audit outcomes and guaranteeing a higher degree of consistency across multiple public institutions. Comparatively, cultural and organisational adaptation serves as an enabling environment that determines whether technological and regulatory advances can be effectively sustained. Particularly, organisational culture, leadership commitment, and openness to innovation play key roles in fostering an ecosystem that is conducive to digital change (Wissal et al., 2025; Mokhtar et al., 2024). Past scholars also elucidated that cultural resistance, hierarchical structures, and limited communication continued to be among the most persistent barriers to transformation among public-sector institutions (Betti et al., 2021; Saengsith & Suntraruk, 2023), which highlighted the importance of developing a culture of collaboration and learning for embedding digital practices into the daily functions of internal auditing (Radwan et al., 2021). As illustrated in Figure 1, capability development provides the technical and operational foundation, compliance offers a regulatory structure, and culture guarantees institutional acceptance and continuity, with the interplay among the three (3) dimensions above producing a cohesive framework that can explain how the public sector in Malaysia can achieve an effective, transparent, and sustainable digital transformation in the process of internal auditing.

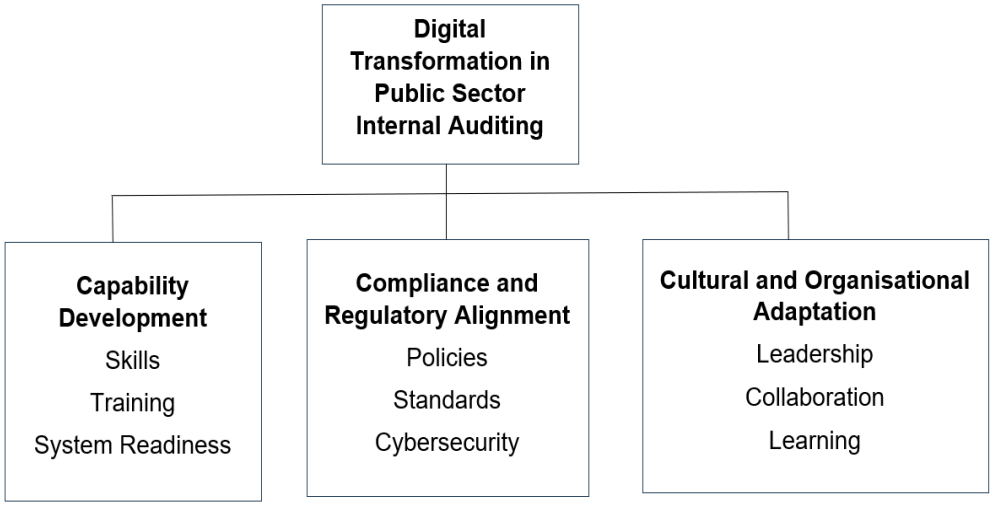

Figure 1: Conceptual Framework for Digital Transformation
Source: Authors' work

2.2 Critical Review of Digital Transformation in Public Sector Auditing

The evolution of digital auditing has led to profound academic discourses regarding whether technological advancements can genuinely improve governance accountability or merely introduce different institutional and operational risks. Specifically, existing studies have generally agreed that technologies, such as AI, robotic process automation, and data analytics, can contribute to higher levels of audit efficiency, transparency, and real-time monitoring capabilities (Volodina & Grossi, 2024; Otia & Bracci, 2022), although there remain debates on the broader implications of digital transformation for public-sector governance. For instance, certain researchers have contended that digitalisation can help strengthen audit quality and institutional accountability through predictive analytics and automated assurance systems (Argento et al., 2025; Pizzi et al., 2021), whereas other scholars have cautioned that excessive dependence on technology may create cybersecurity vulnerabilities, algorithmic opacity, and weakened professional judgement in the processes of auditing (Azizi et al., 2024; Udrescu, 2024). In addition, a majority of the existing literature has concentrated predominantly on technological opportunities rather than the critical discussion of organisational readiness, institutional resistance, and regulatory fragmentation within public-sector environments, particularly in emerging economies such as Malaysia.

A growing body of knowledge has focused on how digital transformation can reshape the competencies required of internal auditors and redefine the operational logic of existing audit systems, wherein the current researchers have consistently highlighted the importance of digital literacy, data analytics, and cybersecurity competence in supporting technology-driven auditing practices (Betti & Sarens, 2021; Gökoğlan et al., 2025). Nevertheless, disagreement remains regarding whether public-sector institutions possess sufficient organisational readiness to sustain the above transformations, as, despite the ability of digitalisation enhancing strategic risk management and audit responsiveness (Rakipi et al., 2020; Betti et al., 2021), there are persistent capability gaps owing to limited training, inadequate infrastructure, and uneven institutional support (Ilori, 2024; Usul & Alpay, 2025). Notably, prior scholars often conceptualised capability development mainly as a technical issue without offering sufficient attention to how organisational culture, leadership commitment, and institutional learning environments would influence the abilities of auditors to adapt to digital systems, particularly in emerging public-sector contexts, wherein existing bureaucratic structures and resource disparities might constrain digital readiness.

Another major debate in the current digital auditing literature concerns whether existing regulatory and governance frameworks are adequately prepared to support technology-driven audit practices. Although most scholars have widely acknowledged that digital systems can help improve audit traceability, fraud detection, and compliance monitoring (Mustafa et al., 2024; Azizi et al., 2024), there remain unresolved concerns, especially regarding the legal validity of digital evidence, cybersecurity governance, and ethical implications of algorithm-based auditing systems (Udrescu, 2024; Otia & Bracci, 2022). Similarly, despite developed economies gradually introducing standards pertinent to governing digital audit assurance and electronic evidence management, numerous developing countries continue to experience fragmented regulatory coordination and inconsistent digital governance practices (Volodina & Grossi, 2024; Ahmad et al., 2023). Additionally, past studies frequently presumed that technological implementation would automatically improve accountability, despite limited empirical evidence on how institutional regulatory weaknesses would undermine audit reliability and public trust. Therefore, further investigation is necessary to have a deeper understanding of how public-sector institutions can more effectively navigate the tension between digital innovation and regulatory readiness.

Cultural and organisational factors can complicate the process of digital audit transformation, as, despite substantial scholarly attention to technological innovation, existing studies have highlighted that cultural resistance, bureaucratic inertia, and fear of transparency are among the most persistent barriers to the implementation of digital audits (Betti et al., 2021; Wissal et al., 2025). Furthermore, the current literature has demonstrated that transformation is most successful in institutions with participative leadership, open communication, and a culture of learning (Ilori, 2024; Saengsith & Suntraruk, 2023). Nonetheless, existing research has often isolated cultural and behavioural variables from broader governance dynamics, which has led to an incomplete understanding of how institutional culture can mediate the relationship between technology adoption and audit effectiveness. Similarly, in Malaysia, hierarchical structures and risk-averse cultures have frequently been cited as the key inhibitors of innovation, with only a few empirical studies exploring how such organisational conditions can shape the trust, motivation, and engagement of auditors in digital environments (Mokhtar et al., 2024), thus restricting the explanatory power of the current digital transformation models, which remain overly technology-centric. Moreover, although the existing body of knowledge has offered valuable insights, there remain substantial conceptual and empirical deficiencies, especially when most of the existing studies have addressed digital auditing from single-dimensional perspectives, namely, either technological, regulatory, or cultural, without incorporating the above factors into a more holistic analytical framework (Argento et al., 2025; Wissal et al., 2025). In addition, existing empirical evidence from emerging economies, particularly Malaysia, remains scarce and fragmented, due to a predominant reliance on quantitative surveys rather than interpretive experience-based enquiry (Ahmad et al., 2023; Udrescu, 2024). There has also been limited theoretical engagement regarding how capability, compliance, and culture interact to shape the effectiveness of digital auditing systems. In sum, the above gaps highlight the need for qualitative and context-specific studies that focus on digital transformation not merely as a technological phenomenon but also as a socio-organisational process that is embedded within cultural and institutional realities. As such, the present study responded to the above need by exploring the interrelationships among capability development, compliance readiness, and cultural adaptation in the transformation process of audit practices within the Malaysian public sector.

3.0 Methodology

3.1 Research Design and Context

The present study employed a qualitative exploratory design to appraise how digital transformation would reshape existing audit practices in the Malaysian public sector. Specifically, a qualitative approach was deemed appropriate, owing to its ability to offer a deeper understanding of perceptions, experiences, and institutional realities that could not be captured by quantitative methodologies, particularly when a majority of previous studies concentrated on technological adoption and audit efficiency (Betti & Sarens, 2021; Rakipi et al., 2020), instead of the behavioural and cultural dimensions of digital transformations. Hence, the evolving landscape of digital governance initiatives in Malaysia offered a pertinent setting for the current enquiry, which would garner key perspectives on how developing economies could adapt existing auditing functions to fulfil the demands of a data-driven environment.

3.2 Sampling and Participants

Purposive sampling was employed to identify participants with direct professional involvement in internal auditing, governance, compliance, or digital system implementation among public-sector institutions in Malaysia. Particularly,

the inclusion criteria required participants to (1) hold a position related to internal audit, financial governance, or compliance management, (2) possess at least three (3) years of working experience in the public sector, and (3) have direct exposure to digital auditing systems, digital governance initiatives, or technology-assisted audit processes within the current institutions. As a result, a total of 27 participants were recruited from various public-sector agencies, including federal departments, statutory bodies, local authorities, and government-linked administrative institutions, which could help capture a broader range of institutional experiences and perspectives on digital audit transformation. The participants consisted of operational auditors, middle-level audit officers, senior audit managers, and governance personnel with responsibilities related to audit oversight and compliance functions, and they were recruited through professional networks and formal institutional communication channels. Accordingly, initial invitations explaining the purpose of the study were distributed via email and professional contacts, followed by voluntary participation confirmation from interested parties, with the process of sampling continuing until thematic saturation was achieved, namely, no substantially different themes or insights emerged from subsequent interviews.

3.3 Data Collection Procedure

The data were collected through semi-structured interviews conducted between January 2025 and March 2025, which aimed to explore the experiences, perceptions, and institutional challenges of the participants related to digital transformation in public-sector internal auditing. Accordingly, an interview protocol was developed based on the conceptual framework of the present study by focusing on three (3) key dimensions, namely, capability development, compliance and regulatory alignment, and cultural and organisational adaptation. All interviews were conducted in either English or Bahasa Malaysia, depending on the language preference of the participants, to guarantee adequate degrees of clarity and comfort during the discussion. Each interview lasted approximately 30 to 60 minutes and was conducted either face-to-face or through secure online meeting platforms based on the availability and organisational requirements of the participants. Due to the sensitivity of governance-related discussions within public-sector institutions, several participants expressed discomfort with audio recordings, especially when discussing organisational weaknesses, digital governance limitations, and internal audit practices. To encourage a higher level of openness and minimise participant hesitation, the current researcher adopted a non-recording interview approach, in which, although the interviews were not audio-recorded, several measures were implemented to guarantee satisfactory levels of data reliability, accuracy, and auditability. During each interview, detailed written notes were systematically taken to capture the responses, key statements, and contextual observations of the participants. Immediately after each session, the current researcher would review and expand the notes into holistic interview summaries, with the discussions remaining salient in their memory. Reflective researcher memos were also prepared after each interview to document the emerging interpretations, contextual insights, and nonverbal observations relevant to the analytical process.

3.4 Data Analysis and Trustworthiness

The interview data were analysed using thematic analysis by adhering to a six-step analytical procedure developed by Braun and Clarke (2006), which included familiarisation with the data, initial coding, theme generation, theme review, theme definition, and report development. In particular, the current researcher repeatedly reviewed the interview notes to identify recurring patterns, institutional concerns, and shared experiences related to digital audit transformation. Subsequently, manual coding was employed to categorise profound statements and concepts into preliminary codes, which were refined and grouped into broader thematic categories that aligned with the conceptual framework of the present study. As a result, through iterative comparison and interpretation, three (3) major themes emerged, namely, capability development, compliance and regulatory alignment, and cultural and organisational adaptation. Concurrently, several measures were implemented to increase the trustworthiness and methodological rigour of the current study, wherein credibility was strengthened through repeated reviews and cross-checking of the interview notes to guarantee sufficient consistency between the participants' responses and thematic interpretation, whereas dependability was maintained by systematically documenting the coding and analytical procedures throughout the research process. Meanwhile, confirmability was enhanced through reflexive note-taking and transparent documentation of analytical decisions to minimise researcher bias, whereas transferability was supported by providing detailed contextual descriptions of the participants, institutional settings, and public sector environment, thereby allowing readers to assess the applicability of the current study results to similar contexts.

3.5 Ethical Considerations

The present study was conducted in accordance with the established ethical standards, in which all participants were briefed on the main purpose of the study, participation rights, and the voluntary nature of participation, with written consent obtained before each interview. No personal or organisational identifiers were collected, and all information was kept confidential. Moreover, the current researcher securely stored all written notes that were used solely for academic purposes. In essence, the above measures ensured that participant anonymity, data integrity, and ethical compliance were maintained throughout the entire study.

4.0 Findings and Discussion

4.1 Demographic Profile of Participants

A total of 27 participants were interviewed, and all served within the public sector in Malaysia. Particularly, each participant had direct responsibility for auditing, compliance, or governance functions and was familiar with the digital initiatives undertaken by their respective institutions. In addition, the participants represented a wide range of organisational levels, namely, from operational auditors to senior managers who would oversee audit functions. A majority of them were between 36 and 55 years old and possessed more than five (5) years of professional experience, which indicated a mature and experienced group that was capable of providing informed perspectives on digital audit transformation. Table 1 presents a summary of the key demographic characteristics of the participants in terms of gender, age, position level, and years of experience, wherein the majority of the participants were female and aged between 36 and 45 years old, holding middle- or senior-level management positions and having above 10 years of professional experience. Thus, the above diverse composition guaranteed that the current results were grounded in practical knowledge and informed by substantial experience in audit management and governance issues.

Table 1: Demographic Profile of the Participants

Demographic Category	Frequency (n = 27)	Percentage (%)
Gender		
Male	12	44.4
Female	15	55.6
Age Group		
25 to 35 years old	5	18.5
36 to 45 years old	13	48.1
46 to 55 years old	9	33.4
Position Level		
Operational Auditor	6	22.2
Middle-Level Auditor	10	37.0
Senior or Top-Level Auditor	11	40.8
Years of Experience		
Below 5 years	3	11.1
5 to 10 years	10	37.0
Above 10 years	14	51.9
Sector		
Public Sector	27	100

Source: Authors' own work

4.2 Thematic Analysis

Thematic analysis was employed to interpret the qualitative data collected from the 27 interviews, owing to its flexibility and capacity to identify, analyse, and report patterns within textual data, hence providing both descriptive and interpretive depth. Accordingly, the analysis followed the systematic process of familiarisation, coding, theme development, and refinement of Braun and Clarke (2006), with each interview note perused multiple times to ensure a deeper understanding of the participants' viewpoints, after which the key statements and recurring concepts were manually coded. The coding process was iterative and interpretive, which allowed relevant patterns to emerge naturally from the data rather than being imposed by predetermined categories. Subsequently, the initial codes were grouped by conceptual similarity before being refined into three (3) major themes that represented the central dimensions of digital audit transformation, namely, capability development, compliance and regulatory alignment, and cultural and organisational adaptation, which collectively encapsulated the experiences, challenges, and perspectives of the participants on the adoption of digital auditing practices in the Malaysian public sector. Table 2 summarises the thematic structure that emerged from the analysis, in which capability development emerged as a key foundation for effective digital auditing, as participants consistently emphasised the importance of technical training and organisational investment in digital skills. Additionally, compliance and regulatory alignment captured the challenges encountered by auditors in adapting existing governance frameworks to accommodate relevant digital evidence, data analytics, and automated processes, whereas cultural and organisational adaptation reflected the human and institutional dimensions of digital transformation, including the willingness to embrace innovation, leadership support, and internal collaboration.

Table 2: Summary of Themes and Sub-Themes from the Thematic Analysis

Main Theme	Description	Key Sub-Theme Identified
Theme 1: Capability Development	Reflects auditors' readiness and competence to utilise digital tools and analytics effectively	1. Technological proficiency and digital literacy 2. Training and skill enhancement 3. Institutional support and resources
Theme 2: Compliance and Regulatory Alignment	Addresses the adequacy of regulatory frameworks and governance mechanisms that support digital audits	1. Digital evidence and audit standards 2. Policy alignment and implementation gaps 3. Ethical and data security concerns
Theme 3: Cultural and Organisational Adaptation	Examines attitudes, leadership, and institutional culture that shape digital audit acceptance	1. Resistance to change and trust issues 2. Leadership commitment and communication 3. Organisational learning and collaboration

Source: Authors' work

4.3 Theme One: Capability Development in Digital Auditing

Capability development emerged as a central theme in understanding how internal auditors in the Malaysian public sector would adapt to digital transformation, in which the findings indicated that the effectiveness of digital auditing depended not only on technological advancement but also on the capacity of auditors to be equipped with, apply, and sustain digital skills within complex bureaucratic structures. Specifically, the participants consistently described a widening gap between the digital transformation agenda of the government and the readiness of internal audit units to implement technology-driven audit practices, which suggested that most public-sector internal auditors recognised the requirement to develop digital competencies, particularly in the aspects of data analytics, automation, and continuous auditing. Meanwhile, multiple participants expressed that existing training opportunities were irregular, theoretical, and insufficient for practical applications:

> "We are expected to apply data analytics in our audits, but most of us have not received formal training on the software tools" (Auditor 6).

> "Our digital training is often limited to basic awareness sessions. There is little guidance on how to integrate these tools into actual audit procedures" (Auditor 14).

Participants further noted that internal audit units often experienced constraints in terms of institutional support, particularly regarding infrastructure and system accessibility, which corresponded to several past studies that also highlighted that legacy systems and limited access to real-time financial data substantially impeded the digitalisation of audit processes:

> "Most of our systems are still standalone. Without integration, it is difficult to perform digital audits efficiently" (Auditor 11).

> "We lack proper technical assistance. Even if we want to use analytics, the necessary support is not always available" (Auditor 22).

Hence, capability development was not merely an individual responsibility but also an institutional requirement that was contingent upon sustained managerial and technological support. Another related issue identified in the interviews was the generational and experiential differences among auditors, wherein younger officers were generally perceived as more comfortable using digital platforms, whereas senior auditors expressed the need for targeted assistance, which was in line with prior studies that digital readiness in public-sector auditing was uneven and influenced by demographic factors, institutional learning cultures and access to structured development programmes (Betti & Sarens, 2021; Ilori, 2024):

> "Younger staff can pick up new systems quickly, but many senior auditors struggle because they were trained in traditional audit methods" (Auditor 9).

Table 3 summarises the main sub-themes identified under the first theme, namely, capability development in public-sector internal auditing. Beyond the technical limitations, the current results revealed deeper challenges related to institutional readiness within the current public-sector auditing environment in Malaysia, in which participants' concerns regarding insufficient training, fragmented systems, and uneven technological proficiency implied that digital transformation continued to be at a transitional rather than fully institutionalised stage. The dependence on traditional audit routines indicated that numerous public-sector institutions continued to operate within legacy administrative structures that were not fully aligned with data-driven governance practices. In addition, generational differences in digital adaptability reflected broader issues of professional identity and institutional learning, wherein experienced auditors trained under conventional compliance-oriented systems might perceive digital auditing as a disruption to established professional practices, thereby suggesting that digital audit transformation was not solely a technological process but also a structural and behavioural transition that necessitated longer-term organisational capability development. In sum, the process of capability development among public-sector internal auditors in Malaysia remains in its formative stage, in which, despite the strong policy direction and awareness of digital transformation, the operational capacity to translate existing initiatives into practice remains limited, thus suggesting that capability building should be institutionalised through structured training programmes, system integration, and supportive leadership, rather than only individual efforts. The results corresponded to the argument of Usul and Alpay (2025) that digital audit transformation requires coordinated investment in both human and technological resources.

Table 3: Sub-Themes and Selected Participant Quotations for Theme One - Capability Development in Public-Sector Internal Auditing

Sub-Theme	Description	Selected Participant Quotation
Technological Proficiency and Digital Literacy	Reflects auditors' technical competence and familiarity with digital audit tools and analytical systems.	"We are aware of digital tools, but applying them in real audit work is still a challenge" (Auditor 3). "Younger auditors adapt faster, but many experienced staff are less confident using digital systems" (Auditor 9).
Training and Skill Enhancement	Relates to professional development opportunities and the adequacy of structured digital audit training.	"Training tends to focus on concepts rather than real applications. We need more case-based exercises" (Auditor 7). "We are expected to use analytics, but there are not enough hands-on workshops to build that skill" (Auditor 14).

Table 3: Sub-Themes and Selected Participant Quotations for Theme One - Capability Development in Public-Sector Internal Auditing (continued)

Sub-Theme	Description	Selected Participant Quotation
Institutional Support and Resources	Concerns organisational readiness, infrastructure, and managerial support for digital capability development.	"We lack integrated systems that allow auditors to access data in real time" (Auditor 11). "Even when we try to apply digital tools, the technical support is insufficient" (Auditor 22).

Source: Authors' compilation

4.4 Theme Two: Compliance and Regulatory Alignment

Compliance and regulatory alignment emerged as the second critical theme in assessing the digital transformation of public sector internal auditing, in which the participants delineated that although digital tools could contribute to higher efficiency and transparency, their effectiveness depended on clearer regulatory frameworks that would define the key standards for digital evidence, data governance, and audit accountability. Numerous auditors also acknowledged that the ongoing public-sector reformation in Malaysia could support digitisation, yet the regulatory environment had not evolved at the same pace as technological adoption:

> "We are moving towards digital audits, but the regulations and guidelines are still designed for traditional audit methods" (Auditor 2).

Several participants highlighted the lack of detailed national or institutional frameworks governing digital audit procedures, which led to uncertainty regarding the acceptability of electronic evidence and the authentication of digitally stored data:

> "There are still grey areas about what counts as valid digital evidence in audit reports" (Auditor 8).

Other participants also expressed concerns about data security and the risk of information breaches, particularly when sensitive financial information was managed via shared platforms:

> "Confidentiality and data protection are our biggest concerns because our systems are interconnected" (Auditor 10).

The results suggested that internal auditors were increasingly aware of the compliance risks associated with digitalisation, particularly in public accountability, as existing auditing standards often lacked specific provisions for digital procedures, resulting in inconsistent practices across different governmental agencies:

> "Each department interprets the digital audit process differently because there is no unified guideline" (Auditor 17).

The above regulatory gap led to practical implications for audit integrity, which could impact the uniformity and reliability of audit findings in the public sector. Table 4 summarises the subthemes identified under the second theme, namely, compliance and regulatory alignment, wherein there was regulatory uncertainty, which indicated broader governance and institutional coordination challenges in the Malaysian public sector. In particular, participants' concerns regarding inconsistent standards, digital evidence validity, and cybersecurity governance suggested that digital audit transformation progressed more swiftly compared to the regulatory structures intended to support the transformation, which indicated a relatively moderate level of digital audit maturity, wherein technological implementation had begun, whereas institutional frameworks remained fragmented and reactive. Additionally, the absence of unified digital audit guidelines across different governmental agencies indicated how bureaucratic decentralisation and administrative silos might weaken policy consistency and institutional trust in digital auditing processes. In sum, the above issues demonstrated that regulatory readiness was not merely a technical compliance issue but also a governance challenge that was closely linked to public-sector accountability and institutional legitimacy, especially when regulatory readiness continued to

be a key obstacle to fully digitising internal auditing in the Malaysian public sector. Although digital tools have been introduced, regulatory structures and compliance mechanisms remain in the process of being adapted to accommodate alternative forms of audit evidence and digital reporting, similar to previous research suggesting that governance frameworks in developing economies would often lag behind technological innovations (Otia & Bracci, 2022; Volodina & Grossi, 2024). The results also revealed that auditors were aware of the above constraints and perceived the need for a higher degree of harmonisation between audit regulations, digital standards, and cybersecurity policies.

Table 4: Sub-Themes and Selected Participant Quotations for Theme Two - Compliance and Regulatory Alignment in Public Sector Internal Auditing

Sub-Theme	Description	Selected Participant Quotation
Digital Evidence and Audit Standards	Addresses auditors' concerns regarding the adequacy of existing audit standards in accommodating digital procedures.	"Audit standards were written for manual audits, not for automated systems" (Auditor 2). "There is still confusion about how to verify and archive electronic records" (Auditor 8).
Policy Alignment and Implementation Gaps	Reflects inconsistencies between national audit policies and the practical implementation of digital processes.	"Departments adopt digital tools differently, so there is no common policy framework" (Auditor 17). "We need clearer regulations that match the government's digital agenda" (Auditor 12).
Ethical and Data Security Concerns	Highlights issues related to privacy, cybersecurity, and the ethical management of digital data.	"Our systems handle sensitive information, so cybersecurity is a major issue" (Auditor 10). "The challenge is balancing transparency with data protection" (Auditor 5).

Source: Authors' compilation

4.5 Theme Three: Cultural and Organisational Adaptation

The third major theme, namely, cultural and organisational adaptation, highlighted the human and institutional factors that would influence the levels of acceptance and sustainability of digital auditing practices in the public sector. Particularly, the participants acknowledged that only technological advancement would be insufficient without a supportive organisational culture and leadership that encourages change, as cultural resistance, hierarchical rigidity, and limited internal communication could hinder the full integration of digital auditing:

> "Technology is available, but the mindset in some departments is still traditional" (Accountant 4).

Resistance to change originated from both fear of technological complexity and uncertainty regarding how digital tools might alter existing roles and responsibilities, in which certain participants admitted that their colleagues hesitated to adopt alternative systems due to the perceived loss of control or increased accountability:

> "Many senior auditors prefer the old way because it feels safer and more familiar" (Accountant 16).

> "There is still a belief that manual checking is more reliable than automated processes" (Accountant 23).

As such, the above perceptions illustrated that successful digital transformation required not only technical readiness but also deliberate cultural management. Additionally, leadership commitment emerged as a decisive factor in shaping organisational attitudes towards digital change, in which participants noted that when top management demonstrated support for innovation, the staff would be more willing to engage in learning and experimentation:

> "When leaders show confidence in digital systems, it motivates everyone to follow" (Accountant 13).

Conversely, limited leadership engagement was discovered to be associated with fragmented implementation efforts and a lower degree of staff motivation:

> "Sometimes the leaders talk about digitalisation, but we do not see follow-up actions" (Accountant 19).

Organisational learning and collaboration were also regarded as the critical enablers of adaptation, especially among participants who experienced collaborative training and knowledge sharing across departments, and reported higher confidence in using digital tools:

> "We learn best when departments work together to solve digital audit issues" (Accountant 25).

The above experiences affirmed the argument that organisational culture, communication, and trust would be essential for sustaining technological reformations in public-sector environments (Wissal et al., 2025; Mokhtar et al., 2024). Table 5 depicts the sub-themes and selected participant quotations that reflected the dimensions of cultural and organisational adaptation identified in the current study. The quotations also revealed that digital transformation in public-sector auditing was strongly influenced by organisational power structures and deeply institutionalised professional norms, wherein resistance towards automated systems reflected not only technological discomfort but also concerns regarding control, accountability, and changing professional authority within the audit processes. Additionally, in hierarchical public-sector environments, traditional audit procedures might provide a sense of procedural certainty and professional legitimacy, which led certain auditors to perceive digital systems as reducing human judgment and oversight and further suggested that leadership behaviour played a symbolic role in shaping the organisational acceptance of digital reformation. In particular, when management demonstrated visible commitment to digitalisation, auditors would appear more willing to experiment, collaborate, and engage in organisational learning. Consequently, cultural adaptation emerged as a critical determinant of digital audit maturity, thereby influencing whether technological and regulatory reformations could be sustainably embedded within existing institutional practices.

Table 5: Sub-Themes and Selected Participant Quotations for Theme Three - Cultural and Organisational Adaptation in Public Sector Internal Auditing

Sub-Theme	Description	Selected Participant Quotation
Resistance to Change and Trust Issues	Captures reluctance to adopt new technologies due to fear, uncertainty, or lack of confidence	"Many auditors still prefer traditional methods because they are more comfortable with them" (Auditor 16). "There is a trust issue with automated systems; people are afraid of making errors they cannot control" (Auditor 23).
Leadership Commitment and Communication	Reflects the role of management in promoting digital initiatives and maintaining clear communication	"When top management supports digital change, it sets the tone for the entire department" (Auditor 13). "Digital transformation cannot happen without strong and consistent leadership support" (Auditor 19).
Organisational Learning and Collaboration	Emphasises shared learning, teamwork, and interdepartmental cooperation in supporting digital adaptation	"Cross-department training helps us understand the system better and reduces fear" (Auditor 25). "We need a culture of continuous learning, not just one-off training sessions" (Auditor 21).

Source: Authors' compilation

The current analysis demonstrated that cultural and organisational readiness were indispensable for the success of digital auditing in the public sector, wherein, despite being the necessary conditions, technological capability and regulatory alignment would not be sufficient without a cultural transformation that could encourage openness, collaboration, and innovation, consistent with the results of Betti et al. (2021) and Wissal et al. (2025), who asserted that leadership behaviour and institutional culture would determine the extent to which digital reformations would be embraced within public-sector institutions. Collectively, the current results demonstrated that digital transformation in the Malaysian public-sector auditing environment was a multidimensional institutional process, which involved the interaction between technological readiness, regulatory governance, and organisational culture. Consistent with the

institutional theory, the present study discovered that digital auditing was profoundly influenced by external governance pressures, regulatory expectations, and accountability requirements that shaped institutional behaviour. Concurrently, the socio-technical theory helped explain how technological systems, human capability, and organisational adaptation should operate in alignment to support sustainable digital transformation. Compared with previous studies that focused primarily on technological adoption or audit efficiency (Pizzi et al., 2021; Rakipi et al., 2020), the current study provided a more integrated qualitative understanding of how institutional fragmentation, leadership behaviour, professional identity, and organisational learning would jointly influence digital audit maturity in public-sector governance systems. The findings further suggested that emerging economies, such as Malaysia, encountered unique challenges, as digital governance reformations often progressed more rapidly relative to institutional and cultural adaptation mechanisms. Hence, digital audit transformation should not be understood merely as a technological upgrade, but rather as a broader institutional restructuring process requiring alignment between capability development, regulatory coherence, and organisational trust.

5.0 Conclusion

The present study assessed the transformation process of internal auditing practices within the public sector in the context of digitalisation by referring to the perspectives gathered from a total of 27 internal auditors across various governmental agencies in Malaysia. By performing a thematic analysis, three (3) major themes were identified, namely, capability development, compliance and regulatory alignment, and cultural and organisational adaptation, which collectively revealed that digital transformation in internal auditing continued to be an evolving process that combined both progress and constraints. Furthermore, internal auditors in the Malaysian public sector were increasingly aware of the importance of digital tools in contributing to higher levels of audit quality, transparency, and efficiency. Meanwhile, several limitations persist in terms of technical proficiency, institutional readiness, and system integration, as the current regulatory environment has yet to fully accommodate the evidentiary requirements of digital audits, and the absence of harmonised standards continues to hinder their consistency. Moreover, existing cultural and organisational factors, particularly resistance to change and varying levels of leadership commitment, have further restricted the pace of digital transformation. Therefore, the present study concluded that achieving sustainable digital reform in internal auditing would require the incorporation of human capability, regulatory adaptability, and institutional culture within a coherent digital forensic framework. Beyond the Malaysian context, the current study could also contribute to broader discussions on digital governance by demonstrating that digital audit transformation would not be solely a technological process but also an institutional and behavioural transition, thereby highlighting the importance of aligning digital capabilities, regulatory frameworks, and organisational culture to achieve more sustainable public-sector accountability in the current digital era.

5.1 Theoretical, Managerial, and Policy Implications

Theoretically, this study contributed to the growing discourse on digital transformation in public governance by incorporating compliance, capability, and cultural factors into a unified framework for digital auditing, which extended the institutional and digital forensic theory by revealing how the interaction between technological infrastructure, regulatory mechanisms, and organisational behaviour could shape audit innovation in the public sector. Concurrently, the current results supported the conceptualisation of a digital forensic internal audit framework, which incorporated traditional audit principles with data analytics, digital evidence validation, and cyber-forensic procedures to help improve accountability and traceability. From a managerial perspective, the results also indicated that internal audit leaders should adopt a strategic approach to capacity building through structured digital training, simulation-based workshops, and system-integrated learning environments, wherein managers should emphasise the practical application of digital forensic tools for fraud detection, data validation, and continuous monitoring. In addition, leadership engagement and knowledge sharing would be essential for fostering a learning culture that could support the inclusion of forensic technology in daily audit functions. At the policy level, the findings also highlighted the requirement for the Malaysian public sector to institutionalise a national internal audit digital forensic framework, which should define clear standards for handling digital evidence, cybersecurity governance, and the admissibility of forensic audit findings. Hence, policymakers should guarantee constant cross-agency collaboration between audit institutions, digital security authorities, and professional bodies to align compliance requirements with the digital forensic procedures. As a result, there will be higher levels of audit integrity, which will reinforce transparency and public confidence in digital governance.

5.2 Limitations and Recommendations for Future Studies

Although the current study provided valuable insights, certain limitations should be acknowledged. Specifically, the qualitative design, based on the semi-structured interviews with a total of 27 internal auditors, offered analytical depth, yet limited generalisation to the wider public sector. Thus, future researchers can consider incorporating larger and more diverse samples to validate the current study results in different institutional settings. As this study also relied on self-reported perceptions, it might not fully capture the operational effectiveness of the digital audit tools, which future scholars can adopt mixed methods or longitudinal approaches to investigate the measurable impact of digital forensic auditing on audit performance and fraud detection outcomes. Furthermore, comparative studies between the Malaysian and international public sectors can assist in providing a broader understanding of how institutional capacity and policy maturity will influence the adoption of digital forensics frameworks. Future studies can also focus on developing and empirically testing a holistic internal audit digital forensic framework tailored to the Malaysian context, which will provide a practical model for incorporating digital tools, forensic analytics, and governance standards into the internal audit process, thereby advancing both academic theory and policy implementation in the era of digital accountability.

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Strengthening Public Sector Operational Asset Management through Current Operational Value (COV) under IPSAS 45 and 46: An Audit and Risk Framework

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Abstract

Purpose: This study examined the application of Current Operational Value (COV) in public-sector asset management, specifically focusing on the Fire and Rescue Department of Malaysia (JBPM) under International Public Sector Accounting Standards (IPSAS) 45 and IPSAS 46. The study aimed to develop a framework for implementing COV, which emphasises audit and risk management to improve the decision-making processes.

Methodology: Qualitative data were collected through semi-structured interviews with representatives of JBPM, accountants, and auditors from the Ministry of Housing and Local Government (KPKT). Thematic analysis was utilised to identify the impact of COV across financial reporting and risk management.

Findings: The findings highlighted six (6) focus areas where COV can strengthen asset management, namely financial reporting, risk management, resource allocation, investment decisions, budget planning, and compliance. The COV enhances the accuracy and transparency of financial information by aligning asset values with actual usage and service potential, further facilitating risk-based auditing and lifecycle monitoring, improving resource distribution and budget forecasting, and supporting compliance with IPSAS standards through standardised training and reporting practices.

Limitations: The study focused on operational assets and excluded property and plant.

Practical Implications: The proposed framework provides public sector managers and auditors with guidance to improve accountability, optimise resource utilisation, and support evidence-based decision-making.

Originality/ Value: This study is among the first to integrate COV into audit and risk management in Malaysia, contributing to more transparent and efficient public-sector asset management.

Keywords: Current Operational Value (COV), Jabatan Bomba dan Penyelamat Malaysia (JBPM), IPSAS 45, IPSAS 46, public sector accounting

This article is part of a research on The Impact of Current Operational Value (COV) on Public Sector Asset Management: A Case Study of Fire and Rescue Department of Malaysia (Jabatan Bomba dan Penyelamat Malaysia) Under IPSAS 45 and IPSAS 46 through *Geran Penyelidikan Perakaunan dan Kewangan Sektor Awam Tahun 2025* (JANM.600-20/1/7 Jld. 2 (83)).

1.0 Introduction

Effective asset management in the public sector is essential to ensure accountability, transparency and efficient resource utilisation. Government agencies are not only expected to provide accurate and reliable information regarding the assets managed but also to handle the operational risks and strict regulatory requirements. Nevertheless, in practice, achieving these expectations is not always straightforward, especially when traditional valuation methods do not reflect the actual condition or usage of assets.

In recent years, COV has gained attention as a more relevant approach to asset valuation. Unlike historical cost methods, the COV focuses on the current service potential of an asset, considering its use and remaining useful life. This focus makes COV more suitable for public sector organisations, where assets are primarily used to deliver services rather than generate profit.

Nevertheless, adopting COV is not only a technical change in accounting. The adoption also presents new challenges, for instance, in terms of risk management and auditing processes. Estimating the current value of assets typically involves judgment and assumptions, which could lead to uncertainties if not properly managed. Concurrently, auditors require clear guidelines to ensure that financial reporting remains consistent and reliable.

In essence, there is a need for a more integrated approach that combines asset valuation, risk management, and audit requirements. This study addressed the stated gap by developing a framework that supports the implementation of COV in the public sector. The framework aimed to improve decision-making and strengthen overall asset management practices by linking the elements together.

2.0 Literature Review

2.1 Current Operational Value (COV)

A measurement framework known as COV was developed to address key aspects of service delivery across numerous assets owned by public-sector organisations. The framework demonstrates the amount a company would have to pay at the measurement date for the remaining service potential of an asset (IPSASB, 2023).

In the Statement of Financial Position, COV represents the amount the entity would pay at the measurement date for the remaining service potential of the existing assets. On the other hand, COV illustrates the consumption of assets in providing services based on the conditions present at the measurement date in the Statement of Financial Performance (IPSASB, 2023).

As a measure to capture the unique characteristics of assets held in the public sector, COV measures assets according to ‘existing use’. This term refers to how an asset or group of assets is utilised and how such utilisation generally reflects the policy objectives of the entity operating the asset (IPSASB, 2023). For example, JBPM focuses on the safety and well-being of the public. Therefore, fire stations and equipment are operated for delivering emergency services rather than generating commercial returns.

2.1.1 Measurement of Current Operational Value

Measurement is a fundamental component of financial statements and is often dependent on sophisticated models and professional judgment, rendering it inherently subjective. Therefore, the selection of an appropriate measurement basis for assets and liabilities is important to achieve the objectives of public sector financial reporting. Effective measurement enables users to assess:

i. The cost of services delivered during the reporting period, whether measured in historical or current terms.
ii. The operational capacity of the entity to continue delivering services in the future using its physical resources.
iii. The financial capacity of the entity to support and finance its ongoing activities (IPSASB, 2024).

The items must be measured in monetary value to be recognised in financial statements. Such recognition is achieved through the measurement process, which requires selecting an appropriate measurement basis and method (Vardiashvili, 2019). As outlined in IPSAS 46, measurement currently provides a comprehensive framework that consolidates the principal concepts and measurement guidance into a single standard. The standard also clarifies how different measurement approaches should be applied in practice across the public sector. The standard highlighted the importance of current value and introduced updated approaches to replace earlier methods, including COV, which is used for measuring assets, cost of fulfilment for measuring liabilities, and fair value, which is applicable to both assets and liabilities, replacing the former “market value” approach.

The guidance on fair value is consistent with the framework established in International Financial Reporting Standards (IFRS) 13, Fair Value Measurement (Druzhilovskaya, 2021; ICAEW, 2023). Fair value is appropriate when an asset is primarily held for the ability to generate economic benefits, such as producing cash inflows, reducing cash outflows, or being sold. The International Public Sector Accounting Standards Board (IPSASB) determined that the fair value approach is not suitable for measuring the current value of assets used in operations. Instead, IPSASB introduced COV as a more relevant basis for such assets (Druzhilovskaya, 2021; ICAEW, 2023).

Both the market approach and the cost approach can be applied to determine the COV. In some situations, an active market may exist for an identical asset, making the market approach a straightforward and effective valuation method (Vardiashvili, 2025). The market approach involves using prices and relevant data from market transactions involving identical or comparable assets, liabilities, or groups of assets and liabilities (Maisuradze & Vardiashvili, 2023). The COV can be measured based on either the price to acquire an identical or similar asset in that active market or the cost to produce an identical or similar asset when such an active market exists.

Correspondingly, the likelihood of an active market decreased as assets became more specialised. In these cases, the cost approach is more applicable. For example, if market prices are only available for new assets, but the asset being valued is used, adjustments must be made to reflect the asset’s current condition and remaining useful life. Regardless of the approach used, the fundamental goal remains the same, which is to represent the value of the asset in its current state and function for service delivery under existing market conditions (IPSASB, 2023).

A reliable acquisition price for a similar asset may not be available in the absence of an active market. Therefore, the COV must be estimated based on the cost of developing or producing the asset by using readily available pricing data. For instance, most military assets, such as aircraft, do not have active markets, as these assets often cannot be purchased as complete and comparable items. In such cases, estimating the COV requires calculating the cost of individual components, such as the fuselage and engines, and the cost of assembling them into a similar asset. These estimates must also be adjusted for age, condition, and functionality (IPSASB, 2023).

2.2 Risk Management

According to the international risk management standard ISO 31000, risk refers to “the effect of uncertainty on objectives,” while risk management refers to “coordinated activities to direct and control an organization with regard to risk” (Rezvani et al., 2023). Ahmeti et al. (2017) referred to risk as an individual’s perception and response to the unknown, and it can yield a more accurate, case-specific understanding when defined by incorporating industry-specific characteristics alongside the organisation’s profile. Generally, risk was primarily viewed as a threat of potential losses, leading organisations to minimise exposure and avoid instability. Nevertheless, over time, risk has also been recognised as a source of potential opportunities, where certain risks can be managed to create value (Collier, 2009).

ISO 31000 provides internationally recognised principles and guidelines for risk management. The standardisation offers a structured framework that helps organisations identify, assess, treat, monitor, and communicate risks across all domains regardless of size or sector (International Organisation for Standardisation, 2018). Malaysia has adopted this standard through MS ISO 31000:2010, which defines risk management as the coordinated activities used to direct and control organisations with respect to risk (Department of Standards Malaysia, 2010). Mikes (2009) noted that industries often adapt control systems to suit their own circumstances, which indicates that risk management frameworks are not applied similarly across organisations.

Traditional approaches tend to focus on exposures that may lead to losses or no change in position at best (Madushanki & Ekanayake, 2022). In contrast, more holistic frameworks such as enterprise risk management (ERM) have become increasingly prominent because these frameworks enable organisations to identify, assess, and respond to risk systematically (Woon et al., 2011). The most widely used ERM model is the Committee of Sponsoring Organisations of the Treadway Commission (COSO) framework. This framework presents risk management across three (3) dimensions: components such as risk assessment, response, and monitoring; objectives including strategic, operational, reporting, and compliance; and organisational levels, namely subsidiary, business unit, and entity (COSO, 2004).

2.2.1 Risk Management in the Public Sector

The same principles, standards, and models of risk management also apply to the public sector (Ahmeti & Vladi, 2017). Nevertheless, public-sector risks are often more complex because the consequences extend to society beyond organisational performance at large. Large bureaucratic structures can make proactive risk management challenging (Dobrea & Ene, 2006), and the presence of multiple layers of operations and objectives further complicates implementation (Siti Zabedah et al., 2019). Public agencies, unlike private firms, cannot simply adopt private-sector approaches, as the objectives of both agencies differ. Public agencies often operate without a profit motive and in conditions that are effectively monopolistic (Cuganesan et al., 2012).

A further distinction lies in accountability. Private firms are accountable to shareholders who choose to invest their capital in such firms. Contrarily, public institutions are accountable to citizens who finance them through taxation (Vincent, 1996). In this context, effective risk management is central to governance because it supports the responsible use of public resources and strengthens oversight, particularly in contractual arrangements (Bebe et al., 2019). The literature on public sector risk management is also largely concentrated in Europe and other developed countries. In these regions, governance and accountability requirements are stronger (Crawford & Stein, 2004; Woods, 2009; Collier & Woods, 2011; Chen & Bozeman, 2012; Hood & Smith, 2013).

Introducing the COV approach to public-sector asset valuation adds a further layer of risk to accrual accounting. Unlike historical cost models, COV requires periodic estimates of the current service potential of an asset based on factors, such as operational condition, functionality, and replacement indicators. Since these estimates depend on judgment, the estimates create scope for inconsistent valuations, biased assessments, and data reliability issues, particularly for specialised operational assets such as motor vehicles owned by JBPM, which lack active markets or standard benchmarks.

These uncertainties can be understood as measurement and estimation risks that should be identified, assessed, and controlled systematically under ISO 31000 and the COSO ERM framework. Therefore, applying these frameworks to the COV process requires clear governance arrangements, well-defined responsibilities, and careful documentation of assumptions such as operational condition factors, verification of data quality, and validation of valuation models. Control measures, such as periodic reassessment of operational condition scores, peer review of valuation assumptions and sensitivity analysis of key parameters, enable the reduction of valuation error and strengthen the credibility of reported figures.

In the accrual accounting context, the quality of earnings and the dependability of financial reporting are affected directly by uncertainties in asset valuation. According to Cohen et al. (2017) and Johnston and Soileau (2020), organisations with more robust risk management systems typically have higher accrual quality since these organisations are better at handling estimation uncertainty. As a result, to increase transparency, generate more accurate service potential measurements, and strengthen stakeholder trust in their financial reporting, public organisations such as JBPM may benefit from incorporating ERM concepts into the COV valuation process.

2.2.2 Risk Management in the Malaysian Public Sector

Various initiatives have been introduced in Malaysia to strengthen governance and improve efficiency within the public sector. One (1) significant development was the issuance of the 2007 Guideline on Good Governance by the Chief Secretary to the Government, which aimed to improve administrative integrity and reinforce accountability (Siti Zabedah et al., 2019). In addition, the Prime Minister's Directive No. 1 emphasised the need for stronger accountability and

highlighted the role of risk management in public administration (Bebe et al., 2019; Abdul Gani et al., 2020). Despite its intentions, the directive has been criticised for offering only general guidance and providing limited detail on the implementation of such practices (Abdul Gani et al., 2020).

The gap between the policy and implementation is further reflected in the findings disclosed in the Auditor-General's Report. The report identified weaknesses in adopting risk management practices across several government agencies, including the Royal Malaysian Customs Department (Auditor-General, 2013). Resultantly, the Ministry of Science, Technology and Innovation introduced MS ISO 31000:2010 through the Department of Standards to provide a more structured approach to risk management in the public sector (Bebe et al., 2019). The absence of comprehensive and detailed supporting policies continues to pose challenges, which results in uneven and inconsistent implementation across government bodies (Abdul Gani et al., 2020).

2.2.3 Risk Management and Accrual Accounting

"Accrual basis is the accounting basis under which transactions and other events are recognised when they occur (and not only when cash or its equivalent is received or paid). The elements recognised under accrual accounting are assets, liabilities, net assets/equity, revenue and expenses." (Accountant General's Department of Malaysia, 2021, p. 7). Revenues and expenses in accrual accounting are recognised when both are earned or incurred, rather than when cash changes hands, for instance, in cases such as depreciation, provisions, contingent liabilities or contingent assets. Since these accruals rely on judgment, estimation and assumptions, the accruals naturally involve uncertainties. Risk management is designed to address such uncertainties. ISO 31000 or COSO ERM provide tools to identify the reliability of those estimates and how the uncertainties affect them.

In terms of compliance and reporting risk, International Financial Reporting Standards (IFRS) under International Accounting Standards (IAS), specifically IAS 37: Provisions, Contingent Liabilities and Contingent Assets, require entities to disclose provisions, contingent liabilities, and contingent assets. On the other hand, IFRS 13: Fair Value Measurement sets out the framework for fair value measurement and related disclosures (IASB, 2018a; IASB, 2018b). In the Malaysian private sector, financial reporting, particularly among listed firms, is governed by the Malaysian Financial Reporting Standards (MFRS). For example, MFRS 137 outlines requirements for recognising and disclosing provisions, contingent liabilities, and contingent assets, closely reflecting IAS 37. Similarly, MFRS 13 adopts the framework of IFRS 13 in guiding fair value measurement (MASB, 2018a; MASB, 2018b). These standards provide a comprehensive basis for reporting financial uncertainties. Nevertheless, their effectiveness ultimately depends on how consistently the standards are interpreted and applied in practice.

A comparable framework exists in the public sector under the Malaysian Public Sector Accounting Standards (MPSAS). MPSAS 19 outlines disclosure requirements for provisions and contingencies, with an explicit emphasis on transparent financial reporting (Accountant General's Department of Malaysia, 2021, p. 5). Nevertheless, despite the formal alignment with private sector principles, differences in institutional context and implementation capacity may affect the extent to which these standards achieve the intended outcomes.

Issues related to earnings quality further highlight the importance of organisational practices beyond formal reporting standards. Existing literature generally highlights a positive association between strong risk management systems and higher-quality earnings. Firms with more developed risk controls tend to produce more reliable accrual estimates. In contrast, weaker systems are often linked to greater estimation errors. For instance, Cohen et al. (2017) suggested that ERM improves the flow of operational information and supports more effective planning, which reduces the likelihood of significant financial adjustments. In turn, this feature enables more accurate accrual estimation. Similarly, Johnston and Soileau (2020) provided evidence that firms implementing ERM practices experience fewer accrual errors, which contributes to more dependable earnings figures. These findings imply that the benefits associated with reporting standards are closely tied to the underlying quality of risk management within organisations.

The latest international guidance on the recognition, measurement, and valuation of public sector assets is provided in IPSAS 45 and IPSAS 46. Both standards are relevant to risk management because asset management, impairment, valuation uncertainty, and disclosure quality may affect financial risk, operational risk, and accountability in the public sector. The MPSAS discussed earlier is based on IPSAS developed by the International Federation of Accountants

(IFAC) (Accountant General's Department of Malaysia, 2023). Nevertheless, IPSAS 45 and IPSAS 46 represent newer international developments in asset management (IPSASB, 2023).

2.3 Audit Requirements to Enhance the Decision-making Process

2.3.1 Audit Requirements

Organisations in public and private sectors are subject to audit requirements as part of broader efforts to ensure transparency, accountability, and compliance with relevant laws and regulations (Financial Reporting Council, 2025). These requirements outline general expectations, procedures, and reporting obligations that guide auditors when examining internal controls, financial statements, and organisational activities. In practice, IFAC helps in ensuring that audits are conducted consistently and impartially, while also maintaining professional standards. Audit requirements also help protect stakeholder interests, improve the reliability of financial information, and support more informed decision-making by clarifying what should be reviewed and how the process should be undertaken. More broadly, audit requirements underpin the level of trust placed in organisational reporting.

At the international level, auditing practices are largely shaped by the International Standards on Auditing (ISA), which had been issued by the International Auditing and Assurance Standards Board (IAASB, 2021). These standards are widely recognised and provide a principles-based framework that is applicable across different types of entities, including corporations and public sector organisations. The ISA outlines key aspects for the audit process, such as risk assessment, evidence gathering, audit planning, and reporting (IAASB, 2021). Although jurisdictions may differ in their regulatory environments, the framework is designed to promote a consistent approach to auditing while maintaining audit quality and professional integrity.

The primary objective of an audit under the ISA is to provide reasonable assurance that financial statements are free from material misstatement and prepared in accordance with the applicable reporting framework (IAASB, 2021). The notion of "reasonable assurance" reflects a high, but not absolute, level of confidence. The notion also recognises that auditors must rely on professional judgement in determining whether sufficient and appropriate evidence has been obtained.

Currently, the ISA framework is applied, either directly or with local adaptations, in more than 130 jurisdictions globally, including the United Kingdom, Australia, Singapore, and Malaysia (Financial Reporting Council, 2025; IPSASB, 2022). This widespread adoption has contributed to improved consistency and comparability in audit practices across borders (International Auditing and Assurance Standards Board, 2023). In turn, the adoption supports the functioning of global capital markets by increasing the credibility of financial reporting. In terms of multinational firms and international investors, the alignment is particularly important, as it improves the reliability and comparability of financial information across different regulatory environments.

By building on the global framework provided by the ISA, Malaysia has developed its own regulatory environment to ensure that these principles are implemented effectively at the national level. Audit requirements in Malaysia have been established to promote the preparation of accurate, reliable, and transparent financial statements. These requirements are grounded in statutory and professional frameworks that govern both private sector and public sector entities. Under the Companies Act 2016, most companies are required to audit their financial statements annually by an approved auditor, although certain categories of private companies may qualify for audit exemption based on prescribed criteria. Although this requirement applies broadly, publicly listed companies are typically subjected to more stringent compliance and disclosure expectations due to their greater accountability to external stakeholders.

Consistent with the international emphasis on audit quality and comparability, audits in Malaysia are conducted in accordance with the requirements of the ISA, alongside the Approved Standards on Auditing (ASA) issued by the Malaysian Institute of Accountants (MIA) This dual framework reflects the adoption and localisation of global auditing standards in Malaysia, which ensures that audit practices remain aligned with international expectations while accommodating domestic regulatory needs. The standards provide guidance on key audit processes, including risk assessment, evidence collection, auditor responsibilities, and reporting.

Besides compliance with technical standards, Malaysian auditors are also bound by professional ethical requirements outlined in the MIA By-Laws on Professional Ethics, Conduct, and Practice. These requirements also align with the Code of Ethics issued by the International Ethics Standards Board for Accountants (IESBA), which reinforces core principles such as integrity, objectivity, professional competence, confidentiality, and professional behaviour. Collectively, these regulatory and ethical structures demonstrate how the broader ISA framework is operationalised within Malaysia, further contributing to the credibility of financial reporting and strengthening trust in the auditing profession.

On the other hand, to ensure accountability and proper management of public funds, the National Audit Department undertakes audits for public sector organisations in accordance with the Audit Act 1957 and relevant INTOSAI (International Organisation of Supreme Audit Institutions) standards. These standards help to ensure that auditors maintain independence, integrity, and professional competence throughout the audit process. By following the demanded legal and professional requirements, audits in Malaysia not only meet regulatory obligations but also strengthen stakeholders' confidence and support good governance practices.

2.3.2 Audit Requirements in the Public Sector

Auditing within governmental organisations in the public sector is essential for promoting accountability, transparency, and effective governance. As a measure to ensure the efficient and responsible management of public resources, independent evaluations of financial statements, operational activities, and compliance with legal and regulatory requirements are necessary. By strengthening financial management practices, identifying weaknesses in internal controls, reducing risks, and improving budgetary oversight, public sector audits contribute to greater governmental transparency and operational efficiency. Regular audits also enhance the quality of public service delivery by encouraging continuous improvements in government operations (Harman, 2025).

Furthermore, public sector auditing plays a critical role in helping to maintain accountability and public trust in governmental institutions. Independent audits conducted at the federal, state, and agency levels involve the collection of audit evidence systematically, detailed data analysis, and the issuance of professional audit opinions. This process evaluates whether the produced financial statements are free of material misstatements caused by fraud or error (Mohd Nassir & Awang, 2025).

In the public sector, the internal audit unit is responsible for undertaking financial, compliance, and performance audits. Internal auditors inspect operational and financial data to ensure that reported records are accurate, complete, and reliable (Mohd Nassir & Awang, 2025). In addition, by assessing whether ministries and agencies properly manage their financial records and comply with applicable laws and accounting standards, independent auditors provide assurance on the financial statements and issue audit opinions. These auditors also determine whether the financial statements provide an accurate and fair picture of the financial situation of a company (Mohd Nassir & Awang, 2025). The Auditor General also ensures that accounting records are maintained up to date and that financial statements are prepared correctly. Compliance audits undertake an assessment to determine whether public sector organisations are following the rules, laws, and guidelines that apply to them. On the other hand, performance audits assess whether the government is running its operations effectively, efficiently, and cost-effectively, and whether fixed goals have been set (Mohd Noor et al., 2023).

The Ministry of Finance (MOF) in Malaysia adopts the MPSAS as the official accounting framework for the public sector. The MPSAS is based on the IPSAS. Under the regulations of the Financial Procedure Act 1957 and the Ministerial Functions Act 1969, the MOF is responsible for developing financial policies, implementing integrated government financial management accounting systems, and ensuring proper public financial management. The MOF also mandated all federal, state, and local government agencies to prepare financial statements in accordance with MPSAS to ensure consistency and compliance with international best practices. Subsequently, these financial statements are audited by the National Audit Department of Malaysia (NADM). The audit process comprises two (2) stages: the interim audit and the final audit. The interim audit is undertaken to identify possible material misstatements in the financial statements through analytical procedures, substantive testing, and tests of controls. After the financial statements are completed and submitted for audit, the final audit is conducted. Auditors review, verify, and analyse the final figures reported in the financial statements at this stage. In accordance with the ISA, auditors must determine the materiality levels for possible

misstatements. ISA 320 states that materiality requires professional judgement and is based on whether the financial statements present a true and fair view (IAASB, 2018).

By evaluating the economy, efficiency, and effectiveness of governmental operations, public sector audits preserve public funds and improve service delivery. These audits provide assurance to stakeholders, including citizens, legislators, and oversight bodies, that government activities are undertaken with integrity and in the public interest (Harman, 2025; Mohd Noor et al., 2023). Historically, stakeholders were satisfied with audit opinions and the assurance that financial statements presented a true and fair view. The current technological advancements have transformed financial processes over the years by enabling accountants to obtain information instantly and allowing markets to respond in real time. Hence, the audited information is now expected to be accurate, reliable, and timely (Mohd Nassir & Awang, 2025). Auditors are now required to employ advanced technologies and software to collect, process, analyse and make sound judgements from large volumes of data (Mohd Noor et al., 2023). Following the revision of the Audit Act 1957, NADM now has 1,856 government-linked companies (GLCs) and almost 474 agencies that require auditing (Mohd Noor et al., 2023). Thus, a smooth auditing process necessitates clear guidelines for measuring assets, especially motor vehicles and operational assets, by using the COV method.

2.3.3 Audit Requirements and Decision-making

Audit requirements are critical for ensuring that decision-makers have access to reliable and accurate information in government, business, or non-profit organisations. These requirements ensure that financial statements provide a true and fair representation of the financial position and performance of an entity by establishing clear auditing standards. The financial statements also strengthen governance, particularly in the public sector, by lowering risks, increasing transparency, and improving overall organisational performance (Mohamad Zam, 2025). The quality of an audit directly affects the quality of the decisions made by decision-makers. Stakeholders, such as investors, regulators, policymakers, and the public, can use accurate, timely and clear financial information to assess the degree to which a company is performing financially, make smart use of its resources, and identify ways to improve. On the other hand, weak or non-compliant audits can lead to bad decisions, money losses, policy failures, and a loss of public trust (Mohd Nassir & Awang, 2025; Harman, 2025).

Adhering to a well-known auditing standard, such as the ISAs, International Code of Ethics for Professional Accountants (IESBA Code), or local equivalents such as Malaysia's Approved Standards on Auditing (ASAs), ensures that audits are undertaken consistently, with independence, and professional integrity. In the public sector, following the MPSAS ensures that government financial statements are even more comparable, reliable, and aligned with global best practices. In today's fast-paced global economy, where markets and policies often change quickly, showing a true and fair picture of financial information is important. Independent auditors give the public confidence that reports are accurate and fair, and ensure that public money is spent wisely.

In addition, modern auditing is increasingly incorporating advanced data analytics, automation, and artificial intelligence (AI) to enable auditors to analyse large volumes of transactions and identify irregularities more efficiently. These technological developments support faster, more evidence-based decision-making in public and private sectors, which enables organisations to respond to emerging challenges more effectively. Overall, by reducing the risks of errors, fraud, and mismanagement, while promoting accountability, transparency, and sustainable development, auditing standards and practices strengthen the decision-making process. Future audits should extend beyond compliance by providing meaningful insights that support strategic planning, performance improvement, and the creation of long-term value (Mohd Nassir & Awang, 2025).

3.0 Research Methodology

3.1 Research Design

This study utilised a qualitative method based on perspectives gained from agencies under the KPKT by specifically focusing on JBPM in two (2) locations. The sample selection was based on the availability of relevant data and the willingness of the agencies to participate in the research.

3.2 Sampling

Guided by the criterion that informants must be directly involved in public-sector asset management, including responsibilities related to accounting, procurement, monitoring, or auditing physical assets, a purposive sampling technique was applied. This approach was selected to ensure that the study gathered rich, relevant, and credible insights from individuals with direct experiences in the recognition, valuation, and utilisation of government assets. Purposeful sampling is particularly appropriate in exploratory studies in which participants' professional roles and contextual knowledge are essential to understanding complex management and valuation processes (Bouncken et al., 2026).

3.3 Data collection procedure

The data collection involved a qualitative approach. Interviews were conducted with nine (9) representatives from JBPM, four (4) accountants, and two (2) internal auditors from KPKT. The participants were selected due to their important roles in alignment with this topic. The representatives from JBPM offered practical insights into the daily implications of adopting COV in relation to financial reporting, asset management, resource allocation, and budgeting. On the other hand, accountants and auditors shared their perspectives on how COV affects risk management, compliance, and the auditing process, which ensures that financial statements remain accurate and compliant with IPSAS standards. Table 1 below lists the details of the informants for the interview:

Table 1: Organisations and Informants

No.	Organisation	Informant's Role	No. of Informants
1.	JBPM Putrajaya	Asset Management Personnel	3
2.	JBPM Meru Raya, Ipoh	Asset Management Personnel	6
3.	KPKT	Accountant	4
4.	KPKT	Auditor	2

The duration of each interview session with the participant ranged from approximately 45 minutes to one (1) hour. All interviews were conducted in person to allow for deeper interaction and clarification of responses, except for the auditors, who were interviewed online through Google Meet.

In addition, archival searches and interviews were undertaken concurrently. Preliminary archival searches identified relevant standards, practices, and issues that guided the development of the interview guide, as summarised in Table 2 below.

Table 2: Archival Source

Source	Documents Reviewed	Relevance to the Study
Accounting Standard	International Public Sector Accounting Standards	Guidance on asset recognition and measurement requirements
Internal Documents	Asset Registers	Understanding asset recording and monitoring
Internal Documents	Operational Records	Understanding asset management practices

Discussions were also undertaken with government accountants from the relevant agencies and auditors from the selected ministry to confirm the scope and context of the study. Subsequent archival searches were then undertaken to validate and complement the findings of the interview. Details of both archival searches and interviews are presented in the subsequent sections.

3.3.1 Interviews

The researchers conducted semi-structured interviews with accountants and auditors from KPKT. An interview guide (Refer to Appendix I) was developed based on issues related to public-sector asset measurement identified from the literature and discussions with officers from the relevant AGD departments. The guide ensured that all respondents would be asked only the same questions. Furthermore, before the interviews, the guide was emailed to the respondents

to help them understand the aims of the issues to be discussed. The interviews involved 15 respondents, who represented one (1) ministry and two (2) government agencies.

3.4 Ethical Considerations

This study considered all relevant ethical considerations. Scientific and Ethical Review Committee of the university has approved the questions with approval number: Re: U/SERC/56(A)-549/2025. The respondents' information was handled with the highest level of confidentiality, and their privacy was protected.

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4.0 Data Analysis and Findings

The objective of this study was to develop a framework for implementing COV in the public sector. The study focused on risk management and audit requirements to improve decision-making processes. The objective was achieved through interviews undertaken with representatives from JBPM Putrajaya and Meru Raya, Ipoh and accountants and auditors from KPKT. The interview was specifically designed to gather perspectives on how COV impacts various financial processes, including financial reporting, risk management, compliance, and audit procedures. The findings are summarised into six (6) key focus areas:

4.1 Financial Reporting

The COV is expected to improve the accuracy and relevance of financial information by ensuring that asset values reflect not only historical acquisition costs, but also actual usage and remaining service potential of the assets. Additionally, this method shifts from rigid depreciation schedules and enables financial statements to provide a more truthful representation of asset condition, which is in alignment with IPSAS 46. Resultantly, users of financial reports, including auditors, managers, and policymakers, are better informed regarding the current utility of public assets. This finding is supported by Informant 3, who stated that "It makes sense because we also consider population density, such as urban versus rural. People can then see the real value. With historical cost, the justification for requesting a new machine isn't clear. We need to keep referring to logs, and it becomes difficult to explain why replacements are necessary."

The perspective stated above reinforces the role of COV in strengthening financial reporting. By aligning valuations with actual usage and service potential, the use of COV reduces reliance on outdated historical costs and administrative logs. This measure produces financial statements that justify asset replacements better and provide decision-makers with a clearer, evidence-based understanding of asset conditions. This finding aligns with the previous study by Vardiashvili (2025). The author concluded that COV improves transparency and accountability by more accurately reflecting resources, service capacity, and financial sustainability of an entity, which improves the relevance of financial reports to decision-making.

Further analysis was performed using thematic analysis through ATLAS.ti. The result is illustrated in Figure 1.

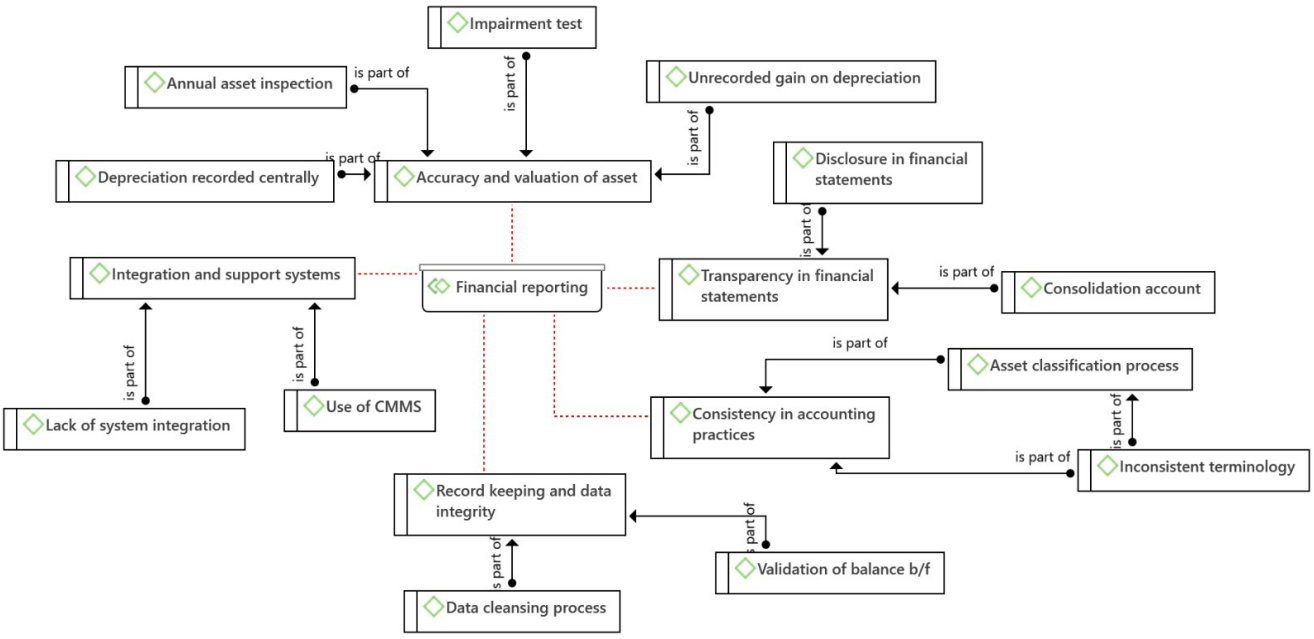

Figure 1: Result for Financial Reporting

Figure 1 illustrates the key themes and categories related to financial reporting. The figure highlights the systematic and procedural issues affecting transparency and consistency.

The key themes related to the financial reporting practices identified from the interviews are presented in Table 3 below.

Table 3: Financial Reporting Theme

Accuracy and Valuation of Assets	The first theme is related to accuracy and valuation of assets. This theme encompasses issues such as the requirement for annual asset inspection, the recording of depreciation (which is handled only at the ministerial level), and unrecorded gain due to disposal. Strengthening these practices will ensure that asset values are captured accurately, which further supports fair and transparent reporting.
Consistency in Accounting Practices	The second theme is focused on the consistency in accounting practices. Consistency should be applied in the asset classification process and the usage of uniform terminology for the asset. These practices will enhance the reliability and credibility of financial information.
Record Keeping and Data Integrity	The third theme is record-keeping and data integrity. This theme emphasises the importance of maintaining accurate records through proper validation of opening balances and systematic data cleansing processes. Strengthening these processes can reduce errors and support decision-making.
Integration and Support Systems	The fourth theme focuses on integration and support systems. The use of Computerised Maintenance Management Systems (CMMS) and improving system integration will streamline processes, improve efficiency, and ensure that financial data flows across departments seamlessly. This integration supports highly effective decision-making and reporting.
Transparency in Financial Statements	The final theme is transparency in financial statements. Adequate disclosures in the notes to the financial statements and in the details of the consolidated accounts are vital to enhancing transparency. These practices improve accountability and increase stakeholders' trust in financial reporting.

Overall, as outlined in Table 3, it is suggested that greater accuracy, consistency, integration and disclosure reinforce the quality, transparency, and accountability of financial reporting.

4.2 Risk Management

The COV framework incorporates contextual factors, such as geographical and operational variability, which enables a more detailed assessment of asset performance across different locations. For instance, comparative findings between JBPM Putrajaya and JBPM Meru Raya, Ipoh, demonstrated how COV captures differences in consumption rates and asset stress due to local operational intensity.

Informant 2 pointed out that:

> "There are two (2) situations. For example, in terms of the extent of protection capacity provided by the assets, the Location A Fire Station might be valued at RM3 million, and the Location B Fire Station at RM3 million as well. But the difference is that the machines in Location B have much higher usage, even though the asset value recorded is the same."

This statement indicates a risk in asset management where the recorded value is the same, but the actual condition and performance highly differ. This finding is consistent with the IPSAS 46 principle, which denotes that COV reflects changes in the asset values since the previous measurement date. Decision-makers may assume that both stations have equal capacity without considering factors such as age and usage. Utilising COV helps capture the real service potential of assets. Hence, risks from ageing or overused operational equipment are clearly observable and can be addressed in planning, as ageing equipment is associated with material deterioration and an increasing probability of failure over time (Bragatto & Milazzo, 2016). The ability to reflect location-based risk enables improved asset monitoring and lifecycle risk assessments. Further analysis was performed using ATLAS.ti, and the results are demonstrated in Figure 2.

Figure 2 illustrates three (3) main themes of risk, namely operational, functional and technical, and strategic risks. Operational risks relate to how assets are utilised, maintained, and documented. Focusing on these risks through improved record-keeping systems will ensure the timely maintenance of assets. Such improvements also align with disposal decisions and actual asset usage, supporting more efficient resource allocation and reducing wastage. For example, the main risk with older assets is related to wear and tear. Alternatively, the concern for newer assets could be whether operators have received adequate training to handle these assets. On the other hand, functional and technical risks highlight the importance of ensuring that assets perform as intended and that the staff handling them have adequate skills to maintain them. For highly specialised operational equipment, such as helicopters, Informant 13 highlighted the need for qualified technical personnel to oversee such equipment. This skill includes assessing whether personnel in relevant divisions, such as engineering, possess the required qualifications. If the related personnel lack the necessary qualifications but are still expected to undertake repairs, this limitation poses significant risks and raises concerns regarding their credibility should any issues arise. Investing in technical training and adopting suitable technologies can reduce breakdowns, improve efficiency, and increase the reliability of asset-based decisions. The finding revealed that strategic risks are considered in the broader environment where the assets operate. Harmonising practices across departments and accounting can improve consistency in risk management for location-specific factors.

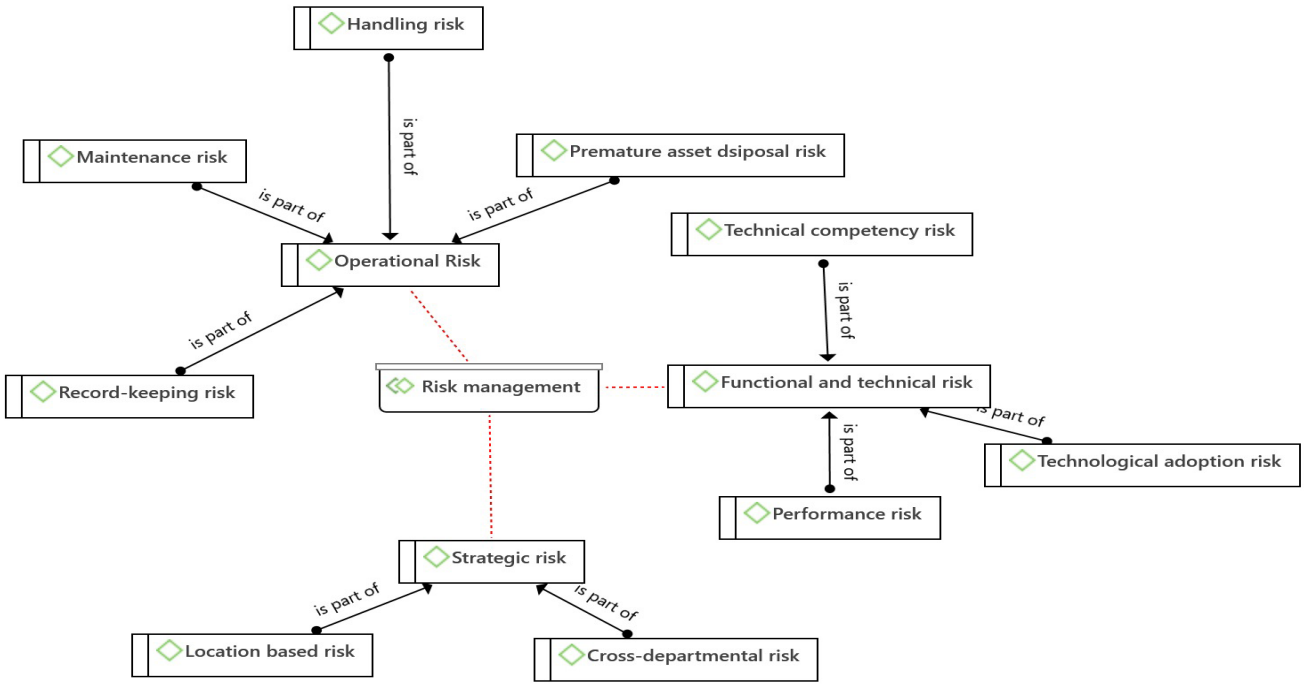

Figure 2: Result for Risk Management

4.3 Resource Allocation

The COV supports more rational and evidence-based decision-making in resource distribution by aligning reported asset values with actual utilisation patterns. The COV balances operational data with managerial judgment to avoid overinvestment in underused assets and underinvestment in critical infrastructure.

Informant 3 highlighted that:

> "Through the e-logistics system, during major disasters, we can see which states have surplus assets. For example, I might require three (3) fire engines. I can check which states have them, determine how to transport them, and coordinate accordingly."

Informants 5 and 6 emphasised that:

> "Maybe when we see that one (1) fire station's asset is heavily utilised, while another station rarely uses theirs, we can just swap them. That saves money and no need to buy new ones. That's good resource allocation. Since it's rarely used, you can make use of the older engine instead."

These perspectives reflect the current reliance on asset availability and condition when making allocation decisions. Nevertheless, without incorporating COV, such decisions may overlook the relative service potential and long-term operational value of the assets. For instance, an older vehicle with high maintenance needs might be deployed simply because it is available. On the other hand, a higher-value, more reliable vehicle remains unused elsewhere.

Integrating COV into this process improves efficiency in budget utilisation and supports performance-based planning. Efficient management of diverse public sector assets is crucial for maximising resource use, reducing costs, and enhancing public service delivery (Kokogho et al., 2024). The integration of COV enables decision-makers to prioritise assets that deliver the highest value and reliability in critical operations. This measure not only improves operational readiness but also develops a clear audit trail for allocation decisions, demonstrating accountability and optimising public expenditure. This approach can reduce maintenance costs, extend asset lifespans, and ensure that limited resources are deployed where they will have the greatest impact over time. The findings from ATLAS.ti are presented in Figure 3 below.

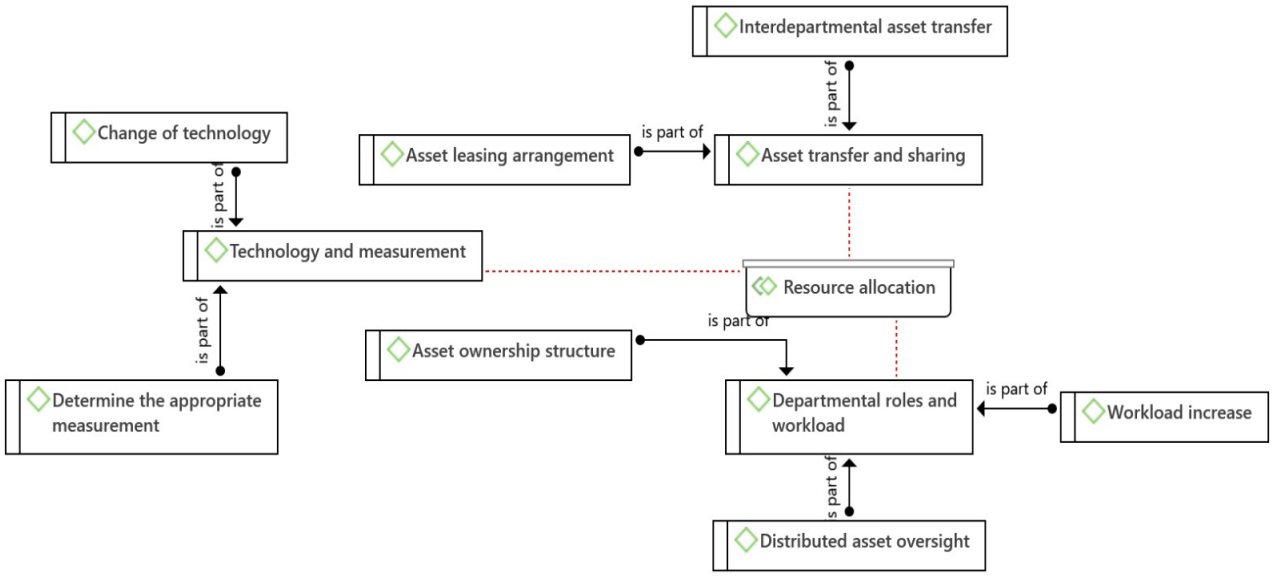

Figure 3: Result for Resource Allocation

The findings presented in Figure 3 illustrate three (3) main resource allocation categories.

4.3.1 Asset Transfer and Sharing

The first category is asset transfer and sharing, which encompasses practices such as interdepartmental asset transfers, COV-supported asset reallocations, and asset leasing arrangements. In addition, these mechanisms illustrate how assets are shared, transferred, or leased across departments to optimise resource allocation and reflect the administrative processes involved.

4.3.2 Technology and Measurement

The second category is technology and measurement. Issues such as technology transition in asset management, appropriate asset valuation methods, and methodological differences in valuation highlight the challenges involved in maintaining accurate and fair asset values. These findings demonstrate how technological changes and differences between COV and existing valuation methods influence the accuracy of asset measurement and, consequently, the efficiency in resource allocation.

4.3.3 Departmental Roles and Workload

Finally, the third category is related to departmental roles and workload. The third category emphasises the implications of asset governance structures. Codes such as decentralised maintenance responsibility, workload implications of asset allocation, and asset-type considerations demonstrate how dividing responsibilities across departments affects asset management. These issues often contribute to increased administrative and operational workloads, particularly when managing owned and leased assets with varying requirements.

4.4 Investment Decisions

Applying COV influences long-term capital planning and procurement cycles. The revised valuations often necessitate updates to asset registries and the prioritisation of replacements or upgrades based on remaining service potential. This measure ensures that investment decisions are grounded in operational realities rather than historical expenditure, which improves capital asset stewardship. Lifecycle infrastructure management, which emphasises safeguarding and maintaining public capital assets, reinforces this finding by highlighting the need to integrate asset valuation with long-term investment planning (Giglio et al., 2018).

Informant 10 viewed that:

> "Each asset has its own controller, and its maintenance records, such as downtime, repair costs, and servicing, must be accounted for. Once this evaluation is completed, the findings are submitted to the Accountant General's Department, which currently uses sample records to develop new policies. In line with international practice, when the recorded value of an asset reaches zero, it should normally be replaced."

The perspective above reflects how COV supports investment decisions by linking asset valuation with long-term capital planning. Maintenance costs, downtime, and repair history help to determine whether to continue investing in an asset or replace it once the value of the asset is exhausted. This finding is consistent with studies of commercial buildings in Australia, which demonstrate that effective maintenance records, covering repair costs, downtime, and servicing, are crucial for guiding investment decisions (West et al., 2024). By aligning replacement decisions with actual service potential rather than book value alone, decision-makers can prioritise upgrades and allocate resources more effectively, ensuring procurement cycles remain responsive to operational needs. The results from ATLAS.ti. are presented in Figure 4.

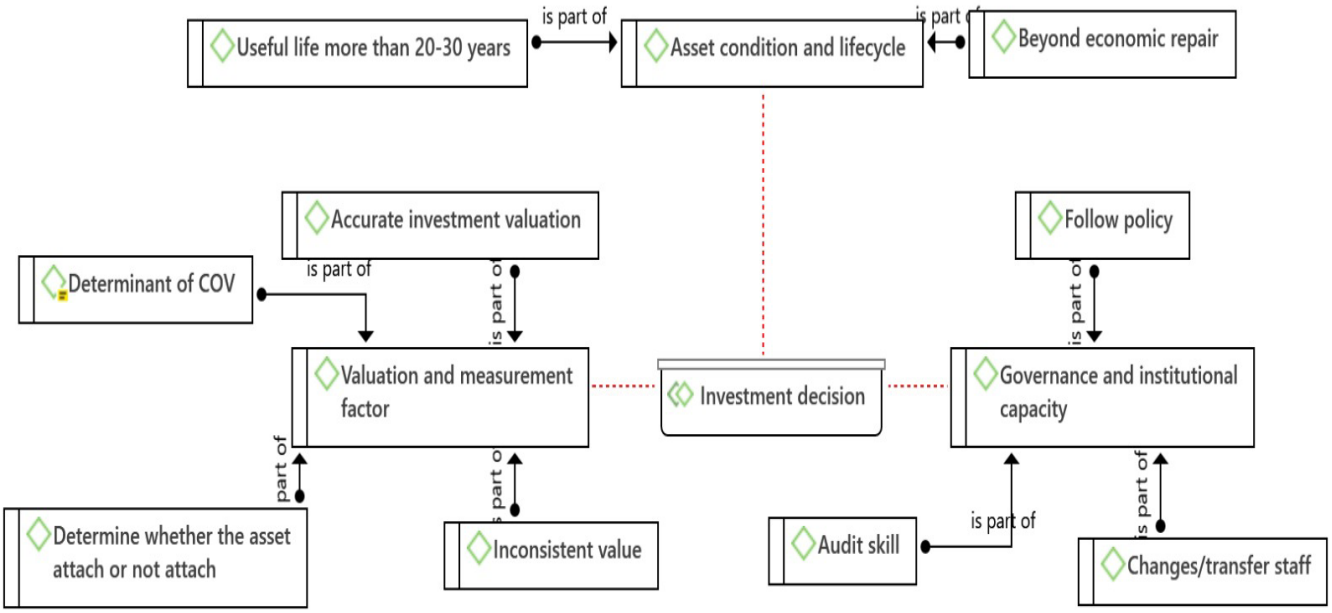

Figure 4: Result for Investment Decision

Figure 4 demonstrates that the codes were categorised into three (3) groups: asset condition and lifecycle, valuation and measurement factors, and governance and institutional capacity. For asset condition and lifecycle, investment decisions are influenced by the physical condition and longevity of the assets. Assets with a useful life of 20 to 30 years offer extended service potential. On the other hand, assets classified as beyond economic repair require timely replacement or disposal. Subsequently, valuation and measurement factors emphasise the importance of ensuring accuracy and consistency in asset measurement. The measurement basis of COV plays a crucial role in reflecting the true worth of assets, while determining whether an asset is attached or not attached is important for classification and reporting. Inconsistent valuations may undermine decision-making. Accurate and reliable valuation processes are essential to support rational investment decisions.

Finally, governance and institutional capacity highlight organisational factors that support effective asset management. Compliance with established policies is required to ensure standardisation and accountability in decision-making processes. Additionally, audit skills are necessary to validate asset records and improve transparency, while changes or staff transfers require continuous guidance and close monitoring during the initial stage. This measure ensures that they quickly adapt and maintain consistent decision-making.

4.5 Budget Planning

The utilisation of updated asset values through COV improves the reliability of budget forecasts and improves planning accuracy. This approach allows departments to better estimate maintenance needs, replacement timing, and funding requirements, further contributing to highly effective asset lifecycle management. As assets are valued closer to their real-time utility, financial planning emerges as data-driven.

According to Informant 11:

> "The issue is whether new procurements will be approved. Assets may need replacement, but will the government provide them? This is why a standardised method like COV is important because it provides clear criteria and justification."

This excerpt denotes how COV strengthens budget planning by standardising replacement criteria and offering evidence-based justifications. The use of COV helps departments secure funding with greater transparency and ensures that requests for budget align with actual asset conditions.

Notwithstanding that, Informant 8 argued that:

> "With straight-line depreciation, assets often appear fully depreciated on paper while still being in good condition. This creates a mismatch between accounting values and actual usability. COV provides a more representative measure, showing whether an asset is truly at the end of its life or still holds value."

This perspective reinforces how COV supports better decisions related to investment by ensuring that capital allocations are based on actual asset performance. This perspective is also consistent with the findings that cost information influences budgetary decision-making (Kuroki & Motokawa, 2022). Such information prevents premature replacements, maximises asset utility, and directs investment only where it is genuinely required.

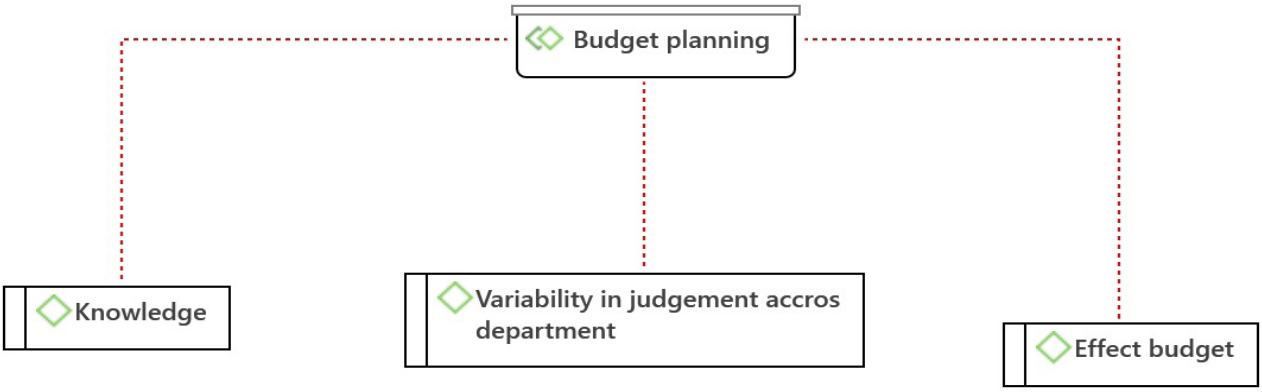

Figure 5: Result for Budget Planning

Figure 5 illustrates how the COV requires sufficient knowledge, consistent judgment across departments, and effective budgeting to measure an asset.

4.6 Compliance

The adoption of COV demands a high degree of technical competence to ensure consistent, standardised implementation. Developing compliance includes training finance officers, asset managers, and auditors on the principles and application of IPSAS 46. Compliance with public sector accounting standards requires integrating professional judgment, audit trails, and expert valuation input to maintain transparency, comparability, and accountability in financial reporting.

Informant 6:

"For training, the process needs to be reset first by clarifying what data should be captured."

Informant 5:

"There must be a standardised training module."

These views highlight that compliance is not only about correctly applying IPSAS 46 but also about ensuring that staff receive structured and standardised training. By embedding COV into formal training modules, organisations can safeguard consistency, comparability, and adherence to accounting standards, which further strengthens transparency and accountability in financial reporting. This notion aligns with findings from prior studies, which denote that continuous training in governance and regulations is essential for building a culture of compliance and accountability (Efunniyi et al., 2024).

Figure 6 illustrates that compliance with audit procedures and regulatory requirements must be supported by proper record-keeping, transparency, and standardisation. Compliance with financial regulations is a central concern in auditing (Balogun et al, 2023). Clear policies and guidelines on COV should be established to ensure consistency, complemented by structured training modules to build staff capacity. For strengthening policy acceptance and promoting effective governance, a well-communicated justification for adopting COV is also essential.

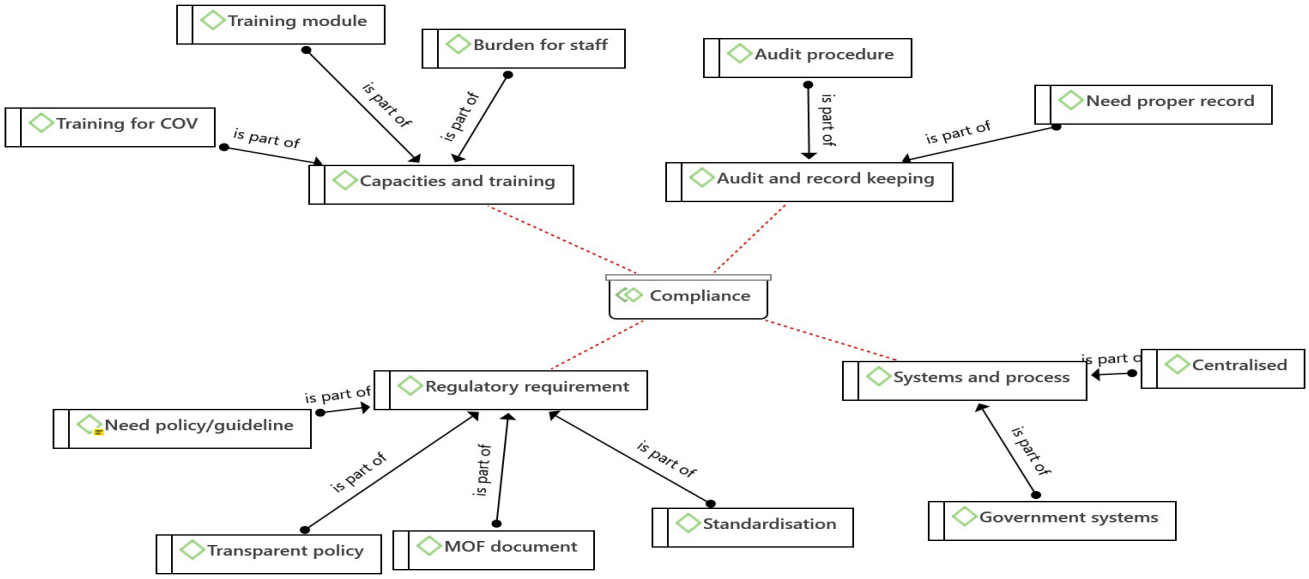

Figure 6: Result for Compliance

Based on the discussion above, the following framework was developed:

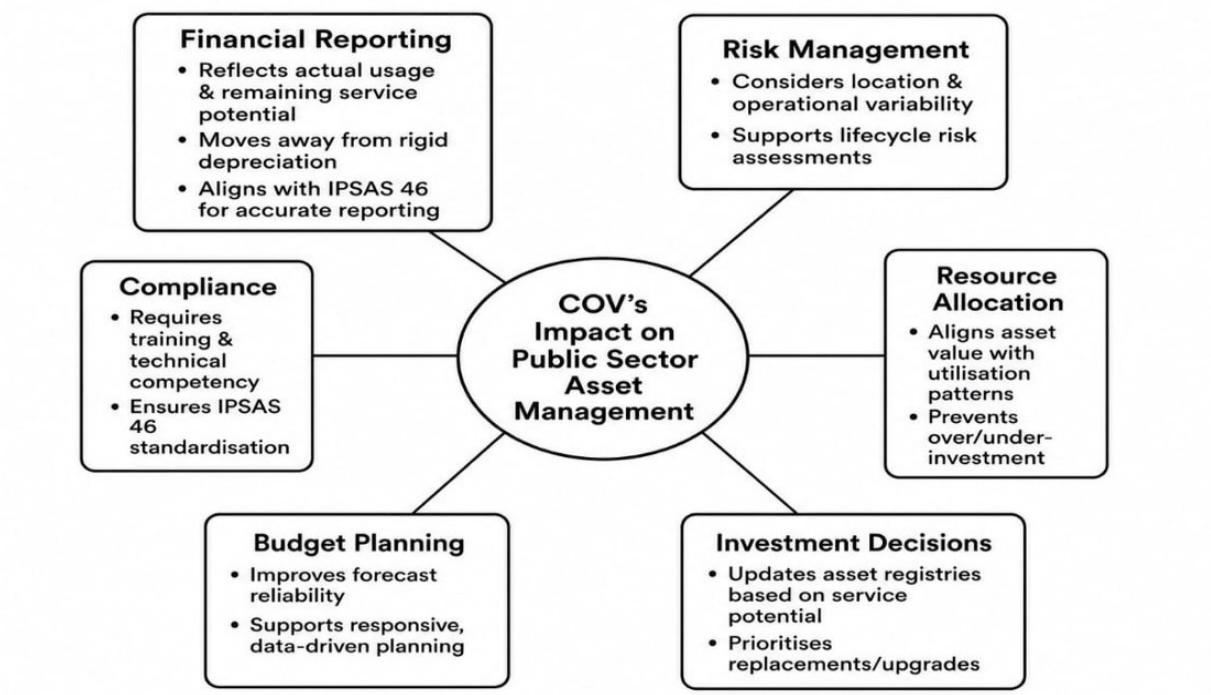

Figure 7: Key Focus Areas of the Impact of COV on Public Sector Asset Management

Figure 7 illustrates the proposed framework for implementing COV in the public sector. The six (6) key implementation contexts comprise financial reporting, risk management, resource allocation, investment decisions, budget planning, and compliance. Within financial reporting, COV provides a more accurate reflection of asset usage and remaining service potential, moving away from traditional depreciation practices and aligning with IPSAS 46. From a risk management perspective, COV requires agencies to consider location-specific and operational variability and support lifecycle risk assessments, which ensures that risks tied to asset performance are effectively monitored. For resource allocation, the framework guides decision-makers to align asset values with utilisation patterns, thereby avoiding over-investment or under-investment. In the context of investment decisions, COV supports updated and reliable asset registries, which enable prioritisation of replacements and upgrades based on actual service potential rather than arbitrary timelines. In terms of budget planning, adopting COV improves forecast reliability and supports financial planning that is more responsive and data-driven. Finally, the compliance context highlights the importance of equipping staff with the technical competence required to meet IPSAS 46 requirements and ensure standardisation. Collectively, these six (6) contexts establish a structured pathway for the public sector to implement COV as part of its asset management strategy, thereby enhancing transparency, efficiency, and sustainability in the use of public resources.

5.0 Conclusion

By integrating risk management and audit considerations to strengthen strategic decision-making on asset management, this study develops and proposes a comprehensive framework for implementing COV in the public sector. Data collected through interviews conducted with nine (9) representatives from JBPM and six (6) representatives from KPKT revealed six (6) key areas underpinning the framework: financial reporting, risk management, resource allocation, investment decisions, budget planning, and compliance. The findings indicated that COV improves the accuracy, transparency, and accountability of financial reporting significantly by aligning asset values with actual usage patterns and remaining service potential. The use of COV reduces dependence on outdated historical cost approaches and enhances the relevance of public-sector financial information.

From a risk management perspective, COV offers a more nuanced assessment of asset conditions across varying operational contexts. The detailed assessment enables decision-makers to better anticipate, monitor, and mitigate

risks related to ageing assets, intensive utilisation, and limited technical competency. In parallel, integrating COV into resource allocation and investment planning supports highly rational, evidence-based decision-making by directly linking asset performance, lifecycle conditions, and service potential to capital planning and procurement cycles. The integration minimises inefficiencies arising from overinvestment, underutilisation, or premature asset replacement. At the same time, the integration ensures that limited public resources are allocated to initiatives generating the greatest public value and align with principles of good governance, accountability, and audit.

Importantly, this study emphasises that the successful adoption of COV requires more than technical valuation adjustments and necessitates broader institutional transformation involving training, compliance, and integrated organisational processes. Establishing standardised training modules, system integration, and capacity building across agencies is essential to achieve comparability, consistency, and compliance with IPSAS 45 and 46. Public sector organisations can enhance financial stewardship, strengthen institutional accountability, and support more sustainable long-term asset management planning by embedding COV within audit and risk management practices. Overall, the findings position COV as a valuable framework for improving public-sector asset management while ensuring that financial reporting reflects operational realities and public service outcomes more accurately.

5.1 Practical Implications

The adoption of COV in public-sector asset management offers policymakers, auditors, and managers a more strategic and structured approach to improving decision-making. The COV facilitates evidence-based resource allocation, optimises maintenance and replacement planning and enhances the accuracy of budget forecasting by aligning asset valuations with actual utilisation patterns and remaining service potential. Resultantly, this adoption increases operational efficiency, ensures that limited public resources are deployed towards assets that deliver the highest public value, and minimises the risk of overinvestment, underutilisation, and inefficient capital deployment across the public sector.

Table 4 outlines the audit procedures to develop and propose a comprehensive framework for verifying data integrity, evaluating valuation methodologies, and assessing disclosure adequacy. These procedures align with IPSAS 45, IPSAS 46, the MPSAS, and INTOSAI audit principles.

Table 4: Audit Procedures

Audit Objective	Detailed Audit/ Procedures	Audit Evidence Required	Relevant IPSAS/ MPSAS References
Planning and Understanding the Entity	• Review policies by the entity on COV implementation and valuation methodology. • Identify asset classes selected for COV measurement and rationale. • Understand integration with asset systems (such as iGFMAS and others). • Assess understanding and adoption timeline of IPSAS 45/46 or MPSAS guidance of the management.	• COV policy documents • Asset register overview • Flowcharts of asset valuation processes • Minutes of accounting policy meetings	IPSAS 45: para. 15–25; IPSAS 46: para. 5–10; MPSASB (2023)
Internal Control Evaluation	• Evaluate segregation of duties between asset custodians, valuers, and finance officers. • Review authorisation and procedures for COV adjustments. • Assess system access and data integrity controls. • Examine training records and technical competencies for valuation personnel.	• Internal control manuals • Access logs • Training attendance records • Management review documentation	IPSAS 46: para. 42–45; AGD, Malaysia (2023)
Data Verification and Physical Inspection	• Obtain the fixed asset register and reconcile it to the general ledger. • Conduct physical verification on high-value or high-usage assets. • Review maintenance and utilisation logs to confirm operational data. • Investigate discrepancies or missing asset information.	• Fixed asset register • General ledger reconciliation • Inspection reports • Maintenance and utilisation data	IPSAS 45: para. 33–38; AGD, Malaysia (2023); Azhar & Kishan (2025)

Table 4: Audit Procedures (continued)

Audit Objective	Detailed Audit Procedures	Audit Evidence Required	Relevant IPSAS/ MPSAS References
Valuation Review and Analytical Procedures	• Review valuation techniques (such as replacement cost and service potential model).Test key assumptions: remaining service life, replacement cost, usage rate, and obsolescence. • Recalculate sample COV values to confirm accuracy. • Conduct trend analysis comparing COV and historical cost valuations. • Assess sensitivity to assumption changes.	• Valuation reports • COV calculation worksheets • Historical cost comparisons • Analytical review summaries	IPSAS 46: para. 20–35; IPSASB (2022)
Compliance and Disclosure Testing	• Verify disclosures of measurement bases and valuation assumptions. • Ensure consistency between note disclosures and underlying schedules. • Check for proper restatement of comparative data. • Evaluate completeness of disclosure on valuation uncertainty.	• Financial statements • Notes to accounts • Disclosure checklists • Comparative analysis reports	IPSAS 45: para. 40–49; MPSAS 17
Conclusion and Reporting	• Summarise audit findings and control deficiencies. • Assess whether COV-based asset values are free from material misstatement. • Provide recommendations on system improvement and documentation practices. • Issue an audit opinion on fair presentation of service potential.	• Audit summary report • Management letter • Auditor's opinion • Corrective action plan	INTOSAI ISSAI 1620; IPSAS 46 para. 50–52

Additionally, the framework emphasises compliance with IPSAS 45 and 46 and incorporates risk management considerations, which enable more effective internal audits and lifecycle monitoring. Standardised training modules and integrated systems ensure consistency across departments, which strengthens transparency and accountability in financial reporting. Overall, implementing COV allows public sector organisations to make informed investment decisions, improve asset stewardship, and increase the credibility and reliability of financial statements, further supporting sustainable public service delivery.

5.2 Limitations and Recommendations

This study exclusively focused on operational assets within the JBPM, excluding property, plant, and infrastructure assets, which may present distinct valuation complexities and management considerations. Furthermore, the findings of this study were derived solely from qualitative interviews conducted with selected representatives from JBPM and KPKT. Thus, the research approach may limit the broader generalisability of the findings to other public-sector organisations and administrative contexts. The study also reflects existing practices, perceptions, and institutional conditions at a particular point in time, all of which evolve alongside changes in policies, technological systems, governance structures, and resource allocation mechanisms.

As a measure to evaluate the wider applicability and scalability of COVs across the diverse public sector, future research should broaden the scope of the study by incorporating property, plant, and infrastructure assets. Additionally, quantitative approaches should be integrated by empirically assessing the financial, operational and governance impact of COV implementation over time to complement the qualitative findings. From a practical perspective, to facilitate consistent, transparent, and reliable adoption of COV practices, public sector agencies should prioritise developing a standardised training framework, integrated information systems, and comprehensive audit protocols. Embedding COV into long-term capital planning and performance-monitoring systems in public asset management would further strengthen resource allocation efficiency, enhance risk management capabilities, and reinforce accountability and sustainability.

Acknowledgment

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APPENDIX

Interview Guide

THE IMPACT OF CURRENT OPERATIONAL VALUE (COV) ON PUBLIC SECTOR ASSET MANAGEMENT: A CASE STUDY OF FIRE AND RESCUE DEPARTMENT OF MALAYSIA (JABATAN BOMBA DAN PENYELAMAT MALAYSIA) UNDER IPSAS 45 AND IPSAS 46

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Overview

The valuation of Property, Plant, and Equipment (PPE) plays a crucial role in supporting the operational efficiency of public sector agencies like Jabatan Bomba dan Penyelamat Malaysia (JBPM). Traditional valuation methods, such as historical cost, often fail to capture the true current operational value (COV) of these assets, potentially leading to inefficiencies in decision-making, resource allocation, and strategic planning. With the introduction of IPSAS 45 and IPSAS 46, which advocate for the use of COV in post-recognition measurement, there is a need to explore its practical implications for the public sector.

Research on the application of COV in Malaysia is still very limited, and only a few countries have adopted this method. Moreover, IPSAS does not provide clear guidance on its measurement, leaving room for interpretation and debate. Consequently, there is a scarcity of studies and publications that address the challenges and propose solutions for asset measurement in the Malaysian public sector. To address this gap, this study adopts a qualitative research approach through archival analysis and interviews.

Purpose of the Interviews

i. To obtain information to meet the following aims:
ii. To analyse the technical implications of applying Current Operational Value (COV) for motor vehicles and operational equipment at JBPM compared to existing methods.
iii. To determine the direct effects of applying COV on the Federal Government's financial statements using data simulation.
iv. To develop guidelines for the implementation of COV in the public sector, focusing on risk management and audit requirements to enhance decision-making processes.

Target Group

The target respondents are officers handling the assets in agencies, accounting and finance personnel and auditors from selected ministries.

Proposed Interview Guide: Representatives from JBPM and accountants

Preamble:
Informed consent
Permission to record.

Introduction

Tell us your name, designation, role within the organisation, and duration within the current role.

1. Financial Reporting:

i. How do you currently value motor vehicles and operational equipment at your organisation?

ii. What challenges do you foresee if the COV method is introduced for post-recognition measurement of motor vehicles and operational equipment?

2. Risk Management:

i. How do current asset valuation methods impact resource allocation and risk management strategies?

ii. How do you think COV will influence your risk management approach?

3. Decision-Making:

i. How will COV affect resource allocation and investment decisions within your organisation?

ii. Do you think COV provides a clearer understanding of the operational value of assets?

4. Compliance and Reporting:

i. How would you manage the transition from existing valuation methods to COV in terms of compliance with IPSAS standards?

ii. What additional training or tools would be necessary for implementing COV?

Proposed Interview Guide: Auditors

Preamble:
Informed consent
Permission to record.

Introduction

Tell us your name, designation, role within the organisation, and duration within the current role.

1. Audit Challenges:

i. How do you currently audit motor vehicles and operational equipment in public sector organisations using existing methods (historical cost, fair value)?
ii. What auditing challenges do you anticipate with the introduction of COV?

2. Risk and Compliance:

i. How do you assess the compliance risks associated with adopting COV as a measurement basis for public sector assets?
ii. What audit procedures would need to be adapted or introduced to verify COV asset valuations?

3. Transparency and Accuracy:

i. In your opinion, does COV provide more accurate asset valuations than existing methods?
ii. How might the adoption of COV affect the transparency and reliability of public sector financial statements?

4. Audit Recommendations:

i. What guidelines would you suggest for managing the risks associated with implementing COV in the public sector?
ii. What would you recommend to ensure smooth audit procedures for assets measured using COV?

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Reference to other publication must be in American Psychological Association (APA) citation and format style and carefully checked for completeness, accuracy and consistency

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