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Pengukuran Susulan bagi Aset Hartanah, Loji dan Peralatan (HLP) Sektor Awam di Malaysia: Isu, Cabaran dan Hala Tuju Masa Depan

(Subsequent Measurement of Property, Plant, and Equipment (PPE) Assets in the Public Sector in Malaysia: Issues, Challenges, and Future Direction)

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Abstrak

Tujuan: Kajian ini bertujuan untuk meneliti isu dan cabaran dari aspek pengukuran susulan aset hartanah, loji dan peralatan (HLP) sektor awam di Malaysia serta mencadangkan asas pengukuran susulan yang sesuai.

Reka bentuk/ Metodologi/ Pendekatan: Kajian ini mengguna pakai pendekatan kajian kualitatif melalui kaedah analisis dokumen dan temu bual tidak berstruktur bersama lapan (8) orang responden daripada Jabatan Akauntan Negara Malaysia (JANM), Jabatan Penilaian dan Perkhidmatan Harta (JPPH), Badan Berkanun dan Pihak Berkuasa Tempatan (PBT). Responden dipilih menggunakan teknik persampelan bertujuan dan persampelan bola salji (*snowball sampling*).

Hasil: Kajian mendapati ada kelemahan dalam penggunaan asas kos sejarah, terutamanya bagi aset jenis tanah dan bangunan, manakala pengukuran asas nilai saksama agak sukar dilaksanakan dalam konteks aset sektor awam yang kebanyakannya dipegang bagi tujuan penyampaian perkhidmatan. Suatu asas pengukuran baharu yang dicadangkan oleh Lembaga Piawaian Perakaunan Sektor Awam Antarabangsa (IPSASB) di bawah model nilai semasa ialah

Artikel ini adalah sebahagian daripada projek Kajian Kaedah Terbaik Pengukuran Susulan bagi Aset Hartanah, Loji dan Peralatan Sektor Awam yang dibiayai oleh Jabatan Akauntan Negara Malaysia di bawah Geran Penyelidikan Perakaunan dan Kewangan Sektor Awam Tahun 2024 (JANM.100-12/2/1 (9)).

asas nilai pengoperasian semasa atau dikenali sebagai *Current Operational Value* (COV). Ia berpotensi untuk diguna pakai sebagai asas pengukuran aset HLP sektor awam di Malaysia. Namun, terdapat pelbagai cabaran yang perlu ditangani sekiranya asas nilai semasa ingin dipraktikkan sebagai asas pengukuran susulan aset HLP sektor awam.

Implikasi Praktikal: Bagi tujuan pembentukan piawaian dan polisi perakaunan, hasil kajian boleh dijadikan sebagai input berguna untuk mencadangkan kaedah terbaik bagi pengukuran susulan aset HLP yang boleh diguna pakai dalam sektor awam di Malaysia. Seterusnya hasil kajian boleh dijadikan panduan oleh pihak berkepentingan entiti sektor awam untuk memahami dan memperbaiki amalan pengurusan dan perakaunan aset HLP.

Ketulenan/ Nilai: Kajian ini menyumbang kepada pengetahuan dari aspek pengukuran aset HLP sektor awam yang masih kurang dikaji. Perkembangan pesat dalam pembangunan piawaian dan polisi perakaunan berkaitan aset tersebut memerlukan banyak penerokaan tentang isu-isu dan cabaran pemakaian asas pengukuran. Maka hasil kajian ini berjaya memperkayakan pengetahuan berkaitan aspek ini yang boleh meningkatkan kefahaman terhadap pemasalahan, cabaran dan hala tuju pelaksanaan masa depan.

Kata kunci: Pengukuran aset sektor awam, pengukuran susulan, asas pengukuran aset, hartanah, loji dan peralatan, IPSAS 43

Abstract

Purpose: *This study aims to examine issues and challenges in the subsequent measurement of public sector property, plant, and equipment (PPE) assets in Malaysia and propose an appropriate subsequent measurement basis.*

Design/ Methodology/ Approach: *The qualitative research approach was adopted through document analysis and semi-structured interviews with eight (8) respondents from the Accountant General's Department of Malaysia, Department of Valuation and Property Services, statutory bodies, and local authorities. Respondents were selected by using the purposive sampling and snowball sampling techniques.*

Findings: *The study found weaknesses in using the historical cost basis, particularly for land and building assets. Fair value measurement presented significant challenges in the public sector context, as these assets are primarily held for service delivery purposes. A new measurement basis proposed by the International Public Sector Accounting Standards Board (IPSASB) under the current value model is the Current Operational Value (COV). It is seen as having the potential to be adopted as the measurement basis for public sector*

HLP assets in Malaysia. However, various challenges must be addressed if the current value is to be applied as the subsequent measurement basis for public sector PPE assets.

Practical Implications: *The findings provided valuable inputs for proposing the best methods of subsequent measurement of PPE assets suitable for use in the Malaysian public sector, aiding the development of accounting standards and policies. Additionally, the findings can serve as a guide for public sector stakeholders to understand and improve the management and accounting practices for PPE assets.*

Originality/ Value: *This study contributes to knowledge on the measurement of public sector PPE assets, which is a relatively underexplored area. The rapid development of accounting standards and policies related to public sector assets requires extensive exploration of issues and challenges in measurement basis application. Therefore, this study enhances the understanding of these issues and challenges, offering insights into future implementation directions.*

Keywords: *Public sector asset measurement, subsequent measurement, asset measurement basis, property, plant, and equipment, IPSAS 43*

1.0 Pengenalan

Perakaunan dan pelaporan aset hartanah, loji dan peralatan (HLP) bagi sektor awam merupakan suatu aspek yang mencabar. Entiti sektor awam memiliki dan mengendalikan pelbagai jenis aset HLP yang kebanyakannya dipegang untuk tujuan penyampaian perkhidmatan yang meliputi skop yang meluas demi memenuhi tujuan sosial dan ekonomi. Dalam konteks perakaunan, istilah aset HLP sektor awam merujuk kepada item ketara yang (a) dipegang untuk kegunaan dalam pengeluaran atau pembekalan barangan atau perkhidmatan, untuk sewaan kepada pihak lain, atau untuk tujuan pentadbiran; dan (b) dijangka digunakan melebihi satu tempoh pelaporan (MPSAS 17, para 13). Justeru, aset HLP merangkumi jenis aset, seperti tanah, bangunan, loji, peralatan, kenderaan, aset infrastruktur, aset pertahanan, aset biologi, aset sumber asli, aset warisan dan aset dalam pembinaan.

Peralihan kepada perakaunan asas akruan telah mengkehendaki aset HLP ini diakaunkan dan dilaporkan dalam penyata kewangan. Ia dilihat sebagai suatu usaha ke arah pelaporan akauntabiliti yang lebih baik (Christiaens et al., 2015), namun ia datang dengan isu dan cabarannya yang tersendiri. Salah satu isu yang masih menjadi topik hangat yang diperdebatkan ialah berkaitan dengan aspek pengukuran aset HLP (Lombardi et al., 2021). Aspek pengukuran aset adalah penting kerana asas pengukuran yang diguna pakai akan memberikan kesan kepada nilai kewangan aset yang dilaporkan dalam penyata kewangan dan seterusnya menggambarkan prestasi dan akauntabiliti entiti (McDonough & Yan, 2023). Justeru, disebabkan sifat, ciri dan penggunaan aset HLP sektor awam yang unik dan pelbagai,

aspek pengukuran menjadi suatu isu yang kompleks dan hingga kini ia sukar dirungkaikan. Kajian ini ialah untuk meneroka isu dan cabaran pengukuran susulan aset HLP dalam konteks sektor awam di Malaysia serta memberikan cadangan yang bersesuaian untuk menangani isu dan cabaran yang dikenal pasti. Oleh itu, kajian ini dijalankan untuk menjawab persoalan-persoalan berikut:

> Persoalan kajian 1: Apakah isu dalam pengukuran aset HLP sektor awam di Malaysia?
> Persoalan kajian 2: Apakah cabaran dalam pelaksanaan pengukuran dan penilaian aset HLP sektor awam di Malaysia?
> Persoalan kajian 3: Apakah kaedah terbaik pengukuran susulan aset HLP sektor awam di Malaysia?

Penerokaan terhadap isu dan cabaran pengukuran aset HLP sektor awam amat penting bagi menyumbang kepada ilmu pengetahuan perakaunan aset sektor awam yang masih terhad. Ia juga boleh membantu memperbaiki amalan pengurusan dan perakaunan aset HLP (Conrath-Hargreaves et al., 2021). Dalam konteks Malaysia, kerajaan telah mula mengumumkan peralihan kepada perakaunan akruan semenjak 2011 (Malaysian Institute of Accountants, 2011). Namun, isu perakaunan aset HLP, terutamanya aspek pengukuran aset HLP masih menjadi cabaran utama yang perlu dikaji secara meluas bagi menyokong dan melancarkan pelaksanaan perakaunan akruan.

Artikel ini disusun seperti berikut: Seksyen berikutnya akan membincangkan kajian lampau berkaitan latar belakang dan perkembangan perakaunan aset HLP sektor awam serta aspek pengukuran susulan aset HLP sektor awam. Seksyen seterusnya pula memberikan penerangan tentang aspek metodologi kajian yang dijalankan bagi menjawab persoalan kajian dan diikuti dengan laporan hasil kajian serta perbincangan. Artikel ini diakhiri dengan kesimpulan yang membincangkan rumusan hasil, sumbangan serta limitasi kajian dan cadangan kajian lanjut.

2.0 Sorotan Kajian Lepas

2.1 Latar Belakang dan Perkembangan Perakaunan Aset HLP Sektor Awam

Perakaunan aset fizikal atau dikenali sebagai aset HLP dalam konteks sektor awam menjadi suatu fenomena apabila perakaunan akruan diguna pakai dalam sektor kerajaan. Pemakaian asas akruan yang mengkehendaki pelaporan aset dan liabiliti dibuat secara komprehensif dalam penyata kewangan merupakan salah satu reformasi di bawah agenda Pengurusan Awam Baru (*New Public Management- NPM*) (Christiaens, 2004). Namun, berbanding dengan sektor swasta, perakaunan aset sektor awam merupakan suatu isu yang kompleks dan telah diperdebatkan semenjak tahun 1990an (Pallot, 1990) disebabkan ciri dan sifat aset yang dipegang oleh entiti sektor awam adalah unik dan pelbagai. Aspek pengiktirafan, pengukuran dan pendedahan aset HLP sektor awam adalah rumit disebabkan faktor, seperti wujudnya pelbagai kaedah perolehan aset mahupun dari segi penggunaan aset yang unik dan bertujuan khusus (Ouda, 2016).

Sorotan kajian lepas telah cuba merungkaikan aspek perakaunan aset HLP ini dengan memberi fokus kepada jenis-jenis aset unik, seperti aset infrastruktur (Isa et al., 2024), aset sumber asli (Dabbicco, 2021), aset pertahanan dan aset warisan (Basnan et al., 2012; Ellwood & Greenwood, 2016; Wild, 2013). Perbahasan sama ada dari sudut konsep atau teknikal perakaunan dan pelaporan aset-aset unik bagi sektor awam ini secara asasnya cuba menjawab pelbagai persoalan berkaitan definisi, pengiktirafan, pengukuran, dan pelaporan aset-aset tersebut agar perakaunan dan pelaporan bagi entiti sektor awam dapat diperkukuhkan. Berbanding dengan amalan perakaunan dan pelaporan aset HLP sektor swasta yang secara umumnya dipandu oleh piawaian umum yang boleh merangkumi semua jenis aset HLP, perakaunan bagi aset HLP dalam konteks sektor awam adalah kompleks. Pelbagai limit dan kekangan yang perlu diperhalusi disebabkan pemilikan dan penggunaan aset oleh entiti sektor awam kebanyakannya bukan untuk menjana manfaat ekonomi (Anessi-Pessina et al., 2022; Brusca, 2023; Capalbo et al., 2021). Bagi kategori aset tertentu, seperti aset infrastruktur dan aset warisan, perbincangan akademik masih tertumpu pada aspek konseptual asas, terutamanya berkaitan dengan usaha mentakrifkan aset-aset ini secara sistematik dan menyeluruh. Perkembangan piawaian perakaunan sektor awam semasa juga memperlihatkan aspek pengukuran aset HLP kini telah melalui fasa pembangunan yang semakin kompleks (contohnya melalui penerbitan piawaian kerangka kerja IPSASB yang baharu dan juga piawaian pengukuran aset yang terkini iaitu IPSAS 45 dan 46) (ICAEW, 2023).

2.2 Model dan Asas Pengukuran Aset HLP Sektor Awam

Sektor awam mempunyai aset dengan ciri unik dari segi sifat dan penggunaannya yang khusus, seperti aset pertahanan, komuniti, infrastruktur dan warisan. Antara kajian lepas yang cuba memperincikan isu pengukuran aset-aset yang unik ini ialah seperti Isa et al. (2024) yang mengkaji tentang perakaunan aset infrastruktur dan mendapati masih ada kesamaran dalam aspek pengukuran aset infrastruktur serta memerlukan lebih banyak kajian mendalam untuk menyokong perakaunan aset-aset unik tersebut. Isu yang sama telah diketengahkan sebelumnya oleh Lombardi et al. (2021). Selain itu, Aggestam Pontoppidan et al. (2024) telah mengkaji perakaunan aset sumber asli sektor awam dan secara umumnya mengetengahkan isu asas, iaitu wujudnya ketidakjelasan dari segi definisi aset, kelas-kelas aset serta cabaran dalam aspek pengukuran.

Kaedah pengukuran aset HLP yang mendasari piawaian pengukuran aset HLP pada peringkat antarabangsa terbahagi kepada dua (2) kaedah umum, iaitu kaedah pengukuran berasaskan kos sejarah dan kaedah pengukuran berasaskan nilai semasa (nilai saksama – *fair value* atau FV). Kedua-dua asas pengukuran aset ini yang telah pun digunapakai dalam konteks sektor awam mempunyai hujah yang menyokong atau menentang (Caruana, 2021). Contohnya, Biondi dan Oulasvirta (2023) berpendapat bahawa aset HLP sektor awam perlu diukur dan dinilai dengan menggunakan asas kos sejarah. Ia disebabkan tujuan pegangan aset dalam sektor awam kebanyakannya ialah khusus untuk tujuan menyediakan perkhidmatan sosial kepada rakyat, selain kaedahnya mudah untuk diaplikasikan dan menjimatkan kos. Justeru, asas pengukuran nilai semasa dikritik sebagai tidak sesuai dan boleh mengganggu fokus

pihak entiti sektor awam untuk melihat aset-asetnya dalam rangka kerja manfaat ekonomi selain melibatkan implikasi kewangan yang besar untuk menilai semula aset secara berkala.

Namun, berdasarkan panduan piawaian perakaunan antarabangsa, seperti yang dikeluarkan IPSASB, asas pengukuran nilai semasa adalah dicadangkan sebagai alternatif untuk asas kos sejarah demi membolehkan tuntutan keperluan maklumat yang lebih relevan dapat disediakan untuk pengguna maklumat oleh entiti pelapor (ICAEW, 2023). Juga berdasarkan amalan pengukuran susulan aset HLP di negara maju, seperti New Zealand, Australia dan United Kingdom (UK), asas nilai semasa sememangnya telah diguna pakai dalam kelas-kelas aset tertentu, seperti aset jenis tanah dan bangunan untuk tujuan am, aset warisan (Conrath-Hargreaves et al., 2021; Laswad & Redmayne, 2015; Redmayne et al., 2023). Contohnya, terdapat aset warisan khususnya di Muzium New Zealand yang diiktiraf pada sama ada nilai semasa (Redmayne et al., 2023). Kajian oleh Basnan et al. (2024) pula meneliti amalan pengukuran susulan aset HLP di beberapa buah negara dan mendapati negara UK, New Zealand dan Australia mengguna pakai asas nilai semasa, terutama bagi kelas aset tanah dan bangunan. Walau bagaimanapun, pengalaman aspek pengukuran aset HLP di negara-negara maju tidak semestinya boleh terus diaplikasikan secara terus di negara lain tanpa kajian mendalam yang mengambil kira pelbagai faktor dan pemahaman akan persekitaran tempatan (Roje & Redmayne, 2020).

Selain itu, berdasarkan perkembangan terkini, IPSASB telah menerbitkan dua (2) piawaian terbaharu yang menyentuh aspek perakaunan aset HLP (IPSAS 45) dan pengukuran termasuk pengukuran aset HLP (IPSAS 46). Melalui piawaian baharu ini, satu (1) lagi kaedah pengukuran susulan selain daripada asas pengukuran kos sejarah dan asas nilai saksama telah dicadangkan, iaitu yang dikenali sebagai asas nilai pengoperasian semasa (COV). Asas COV merupakan asas pengukuran nilai semasa, tetapi perbezaan utamanya berbanding dengan asas nilai saksama ialah asas COV mengukur aset berdasarkan nilai penggunaan semasa, sedangkan asas nilai saksama mengukur aset dengan mengambil kira penggunaan tertinggi dan terbaik (*highest and best use*).

Justeru, boleh dirumuskan bahawa aspek pengukuran aset HLP merupakan isu kompleks yang telah diperdebatkan sekian lama dan masih memerlukan kajian lanjut untuk merungkaikan pelbagai masalah pelaksanaan pengukurannya. Ditambah pula dengan situasi perkembangan terkini pada peringkat piawaian antarabangsa yang telah mula memperkenalkan asas pengukuran yang baharu, penerokaan kepada isu dan cabaran pelaksanaan pengukuran aset HLP harus dilaksanakan untuk menyokong amalan dan adaptasi kepada piawaian perakaunan yang akan berkuat kuasa kelak.

3.0 Metodologi Kajian

Kajian ini mengguna pakai pendekatan kajian kualitatif. Data dikumpulkan melalui temu bual tidak berstruktur bersama lapan (8) orang responden daripada wakil daripada JANM, JPPH, Badan Berkanun dan PBT. Responden dipilih melalui teknik persampelan bertujuan dan persampelan bola salji (*snowball sampling*). Pemilihan responden kajian adalah berdasarkan

kriteria mereka, iaitu mereka yang mempunyai kepakaran dan pengalaman dalam aspek pengukuran aset HLP di sektor awam. Jadual 1 menyenaraikan lapan (8) responden yang ditemu bual.

Jadual 1: Senarai Responden Temu Bual

Responden	Jawatan/ Bahagian/ Organisasi
Responden 1	Ketua Penolong Pengarah Kanan, Pasukan Pelaksanaan Perakaunan Akruan, JANM
Responden 2	Penolong Pengarah Kanan, Pasukan Pelaksanaan Perakaunan Akruan, JANM
Responden 3	Timbalan Pengarah Bahagian Penilaian dan Perkhidmatan Harta, JPPH
Responden 4	Penolong Pengarah Bahagian Penilaian dan Perkhidmatan Harta, JPPH
Responden 5	Pegawai Kewangan, Bahagian Akaun, Jabatan Bendahari, Universiti Kebangsaan Malaysia (UKM)
Responden 6	Pegawai Kewangan, Bahagian Aset, Unit Pengurusan Aset, Jabatan Bendahari, UKM
Responden 7	Timbalan Pengarah, Jabatan Kewangan, Majlis Perbandaran Seremban
Responden 8	Akauntan, Jabatan Kewangan, Majlis Perbandaran Seremban

Temu bual yang dijalankan adalah tidak berstruktur dan lebih menyerupai *"conversation interview"* (Patton, 2002) untuk membolehkan penyelidik menjalankan penerokaan terhadap isu kajian. Soalan temu bual yang diajukan kepada responden kajian dibina berdasarkan fokus dan persoalan utama kajian, iaitu untuk memahami amalan semasa pengukuran susulan aset HLP di sektor awam dan mendapatkan pandangan responden tentang isu dan cabaran dalam pemakaian asas-asas pengukuran susulan yang diperuntukkan dalam piawaian sedia ada, iaitu asas kos sejarah dan nilai saksama. Seterusnya, penyelidik turut meneroka pandangan responden berkaitan potensi dan cabaran dalam pelaksanaan asas pengukuran baharu, iaitu asas pengoperasian semasa (COV) jika diaplikasikan dalam konteks sektor awam di Malaysia.

Selain itu, kajian ini turut menggunapakai kaedah analisis dokumen, iaitu penelitian terhadap dokumen-dokumen relevan untuk menjawab objektif kajian. Antaranya termasuk piawaian perakaunan berkaitan pengukuran aset HLP di Malaysia dan antarabangsa (seperti MPSAS 17, rangka kerja pelaporan IPSASB, IPSAS 45, IPSAS 46 dan lain-lain *Exposure Draft* dan piawaian yang relevan), laporan teknik berkaitan asas pengukuran aset, penyata kewangan kerajaan di pelbagai negara (sampel daripada UK, New Zealand, Australia, dan Kanada). Data transkripsi temu bual dan juga dokumen sekuder dianalisis menggunakan kaedah analisis tema untuk mengenal pasti corak persamaan, perbezaan dan perbandingan dalam data-data yang dikumpulkan bagi menjawab persoalan kajian.

4.0 Dapatan Kajian dan Perbincangan

4.1 Objektif Kajian 1: Isu Pemakaian Asas Pengukuran: Kos Sejarah, Nilai Pengoperasian Semasa atau Nilai Saksama?

Amalan sedia ada bagi pengukuran susulan aset HLP sektor awam di Malaysia adalah berdasarkan MPSAS 17 yang memberikan pilihan model pengukuran susulan berasaskan model kos sejarah atau model pengukuran susulan. Namun, berdasarkan polisi sedia ada dalam konteks kerajaan persekutuan, model pengukuran susulan yang digunapakai ialah model kos sejarah. Pilihan untuk mengguna pakai model penilaian semula (berasaskan nilai saksama) mengikut MPSAS 17 sedang dalam pertimbangan dan masih pada fasa simulasi. Namun, peralihan kepada model penilaian semula masih dalam perbincangan disebabkan ketidakjelasan tentang status pelaksanaan perakaunan akruan pada peringkat kerajaan persekutuan. Ia masih boleh dikatakan masih pada fasa pra-peralihan ke perakaunan akruan. Salah seorang responden menjelaskan status pelaksanaan perakaunan akruan oleh kerajaan Malaysia seperti berikut:

> "Sekarang ni kita masih menggunakan model kos berasaskan MPSAS 17 tu. *So* kita nak berubah kepada penggunaan model penilaian semula…isu yang kami masih bincangkan dengan pihak piawaian dan polisi di mana sekarang ni boleh ke kita buat penilaian semula sedangkan kami masih belum (*fully*) *implement accrual accounting*. Kita masih pra-peralihan. Adakah kita boleh anggap (angka) penilaian semula tu sebagai *subsequent (measurement)*? Kalau ikutkan kami punya sistem, kita dah laksanakan sejak 2018, iGFMAS tu, cuma yang dibentangkan (penyata kewangan) ialah *cash accounting, accrual accounting* kami tak bentangkan."
> (Responden 1)

Pemakaian model pengukuran susulan sedia ada, iaitu model kos sejarah mempunyai kelebihan dari sudut ia mudah diaplikasikan dan dikatakan sesuai diguna pakai dalam konteks sektor awam kerana ciri aset HLP sektor awam yang kebanyakkannya dipegang untuk tujuan operasi, iaitu menyediakan perkhidmatan untuk rakyat (Biondi & Oulasvirta, 2023). Namun, terdapat beberapa kelemahan yang dikenal pasti dalam amalan semasa, terutamanya dalam konteks pengukuran aset tanah dan bangunan. Contohnya, salah seorang responden menjelaskan situasi amalan pengukuran susulan berdasarkan asas kos sejarah yang diguna pakai di organisasinya seperti berikut:

> "Dari segi amalan…kita akan gunakan nilai perolehan. Nilai kos. RM3 ribu dan ke atas kita akan *declare* ia sebagai aset dan ia akan disusut nilai. Kita guna kadar susut nilai pun sejak ada MPSAS ni ada lah perbezaan dia macam aset infra...ada lah *percentage* nya dan kita guna kaedah garis lurus sahaja... paling tinggi 20% setahun dan nilai akhirnya akan jadi RM1…Lepas tu bila kita guna MPSAS, kita ada pengalaman bila kita guna untuk aset infra tu, kita ada menubuhkan jawatankuasa penilaian aset dan kita gunakan nilai semasa,

> dinilai secara dalaman…kita senaraikan dulu mana-mana aset yang sesuai sebagai aset infra dan masa tu kita merujuk kepada polisi JKR…jadi kena ukur balik, darab balik dengan nilai semasa, itu lah harga kos yang kita ambil kira dan banyak yang dah tinggal RM1 pun. Bila kita dah kira balik dengan baki usia guna dia, tinggal RM1…aset masih lagi digunakan dan di *maintain* pun, masih lagi di *maintain* seperti biasa, Cuma kalau orang tanya, nilai aset tu RM1 dalam sistem…bila kita nak buat rosot nilai pun, sukar dilaksanakan sebab aset dah nilai RM1." (Responden 6)

Amalan pengukuran susulan berdasarkan kaedah kos sejarah mempunyai kelemahan, terutamanya dalam konteks aset tanah dan bangunan kerana nilai aset yang telah habis disusut nilai serta dinyatakan sebagai RM1 sedangkan aset masih utuh dan digunakan dalam operasi. Juga berdasarkan amalan semasa, tiada semakan dibuat terhadap baki hayat berguna aset. Justeru, pengukuran susulan model kos sejarah dilihat tidak dapat memberikan gambaran adil dan saksama bagi aset HLP, terutamanya bagi bangunan yang kebiasaannya sentiasa dibaik pulih untuk memanjangkan hayat bergunanya.

Menelusuri perkembangan semasa pada peringkat antarabangsa, IPSASB telah menerbitkan dua (2) piawaian terkini, iaitu IPSAS 45 *Property*, *Plant* and *Equipment* dan IPSAS 46 *Measurement*. IPSAS 45 merupakan piawaian baharu bagi menggantikan IPSAS 17, iaitu piawaian perakaunan bagi aset HLP. Sebaliknya, IPSAS 46 merupakan piawaian baharu yang menyediakan panduan tentang asas pengukuran yang boleh diaplikasikan untuk tujuan pelaporan kewangan sektor awam. Intipati utama perubahan asas pengukuran yang dicadangkan dalam IPSAS 46 berbanding kaedah pengukuran sedia ada ialah pengenalan satu asas pengukuran susulan yang baharu, iaitu Nilai Pengoperasian Semasa (COV). Oleh itu, berdasarkan konteks piawaian, terdapat tiga (3) asas pengukuran yang boleh digunakan dalam penilaian aset HLP di sektor awam, iaitu asas kos sejarah, asas nilai saksama dan asas COV. Seiring dengan perkembangan ini, hala tuju masa depan pengukuran aset HLP sektor awam di Malaysia dijangka akan selaras dengan piawaian IPSAS, memandangkan sektor awam di Malaysia mengadaptasi piawaian berasaskan IPSAS untuk disesuaikan dalam konteks tempatan. Justeru, isu pengukuran susulan aset HLP dalam sektor awam di Malaysia perlu diteliti dalam rangka kerja hala tuju masa depan, dengan mengambil kira kebolehlaksanaan kaedah pengukuran baharu yang diperkenalkan, iaitu COV.

Dapatan kajian seterusnya membincangkan isu pelaksanaan asas-asas pengukuran susulan yang dicadangkan oleh IPSASB, termasuk asas nilai saksama dan COV, berdasarkan pandangan para responden yang ditemu bual. Menurut maklum balas daripada pakar penilaian harta yang ditemu bual, konsep asas COV dilihat selari dengan amalan semasa yang dilaksanakan oleh JPPH dalam menentukan nilai semasa aset. Seperti yang dinyatakan oleh Penolong Pengarah Bahagian Penilaian dan Perkhidmatan Harta, JPPH:

> "...kalau saya baca *explanation from these* dua perbandingan kan…*in term of definition* dia kan, *for* Malaysia *actually we are using* nilai saksama juga, *fair value*. Tapi *for Malaysian valuation standard, we call it market value* lah.

> *But when come to accounting, its equal. Market value* dengan *fair value* dari segi maksud dia adalah sama. *Interpretation* dia sama. *So as of now, we are using fair value* lah. Atau *market value as our basis*. Cuma dalam praktis, kita tidak akan menggunakan asas kegunaan tertinggi dan terbaik seperti yang dah terangkan tadi. Contoh, tanah kosong. Kalau kementerian yang memiliki tanah tu adalah Kementerian pendidikan, *so* tapak tu memang untuk kegunaan sekolah sahaja. Kalau *based on* apa yang diterangkan sini, kalau kita nilai *highest and best use*, tanah contoh di kawasan KL kan, *highest and best use* mustahil untuk sekolah kan, mesti untuk bangunan yang 50 tingkat, 60 tingkat kan. *So* kalau kita terpaksa guna *highest and best use*, *so* tanah tu mesti kita kena nilai sebagai tanah komersial. Tapi *in practice* JPPH tidak. Sebab kami faham ini untuk tujuan *accounting*, untuk nak rekod aset-aset kerajaan untuk kegunaan institusi. *So*, *in that case*, kita akan nilai tanah itu bukan sebagai *full commercial* tetapi kita nilai sebagai tanah institusi untuk kegunaan sekolah. *So* nilai dia akan rendah daripada kegunaan tertinggi dan terbaik lah... itu yang bila saya tengok, seolah-olahnya sebenarnya JPPH kami dah praktis lah COV ni." (Responden 4)

Pandangan Responden 4 menunjukkan bahawa asas COV telah diamalkan dengan mengambil kira kesesuaian jenis dan tujuan penggunaan aset-aset sektor awam, yang kebanyakannya dipegang untuk tujuan pengoperasian. Meskipun terdapat perbezaan dalam penggunaan istilah "nilai saksama" antara konteks penilaian oleh JPPH dengan konteks perakaunan, dari segi amalan penilaian JPPH, "nilai saksama" yang diperoleh melalui proses penilaian sebenarnya merujuk kepada asas COV Ia bukan kepada asas nilai saksama berdasarkan prinsip penggunaan tertinggi dan terbaik (*highest and best use*), seperti yang diguna pakai dalam perakaunan. Oleh itu, dapat difahami bahawa asas COV secara dasarnya telah diamalkan, walaupun istilah tersebut tidak dinyatakan secara khusus oleh JPPH.

Tambahan pula, dalam konteks implikasi pemilihan asas pengukuran terhadap konsep pelaporan kewangan yang mencerminkan gambaran yang adil dan saksama, responden kajian berpendapat bahawa asas COV merupakan pilihan terbaik untuk memenuhi ciri tersebut. Beliau menyatakan:

> "Sekarang ni kalau tanya saya sebagai akauntan, kalau ikut senang sebenarnya kos sejarah je lah. Tapi kalau berdasarkan pandangan yang betul-betul akauntan, memang kita nak COV ni lah, yang nilai semasa supaya penyata kewangan yang kita sediakan tu menggambarkan betul dan tepat lah." (Responden 7)

Berdasarkan input daripada Responden 7, asas COV secara idealnya wajar diberikan keutamaan kerana ia mampu mencerminkan nilai semasa aset HLP yang selari dengan keadaan dan tujuan penggunaan aset tersebut. Namun, dari segi praktikal, asas kos sejarah dilihat lebih mudah untuk dilaksanakan.

Selanjutnya, berkaitan pemakaian asas nilai saksama, pakar penilaian aset yang ditemu bual berpendapat bahawa asas ini kurang sesuai diaplikasikan dalam konteks sektor awam kerana ia memerlukan pelbagai andaian yang kompleks bagi menentukan nilai saksama aset. Beliau menyatakan:

> "Cuma hakikatnya untuk aset-aset kerajaan ini, *first* memang kita bukan *profit-oriented* lah. Kalau kita tengok contoh lah, Wisma Persekutuan pun kan, kebanyakkan nya tu memang agensi kerajaan yang duduk dan dia tak *generate income* pun kan. *So*, kalau kita nak pakai kaedah yang untuk *generate income (fair value)*, banyak andaian yang kita kena buat. Contohlah, *office* JPPH kan, sekarang kita memang duduk tiada bayar sewa pun. *So* kita kena andaikan berapa sewa yang sanggup (di)bayar. Itu dah melibatkan banyak andaian lah. *So, at the end, in* JPPH kami akan pakai kaedah kos atau perbandingan[1] ...yang kami rasa terbaik lah. Daripada *you* kena andaikan dia ada *income, you* kena andaikan *contract* semua tu, dia akan jadi lagi merumitkan lah." (Responden 4)

Selain itu, dari perspektif amalan penilaian oleh JPPH, tujuan penilaian merupakan faktor utama yang menentukan kaedah penilaian yang digunakan. Menurut pandangan pakar yang ditemu bual, asas nilai saksama berasaskan prinsip penggunaan tertinggi dan terbaik (*highest and best use*) adalah lebih sesuai digunakan dalam kes-kes tertentu, seperti penilaian aset bagi tujuan pengambilan tanah, yang tertakluk kepada keperluan undang-undang tertentu seperti yang digariskan dalam akta berkaitan. Sehubungan dengan itu, keperluan penilaian aset bagi tujuan pelaporan kewangan dilihat tidak memerlukan pertimbangan aspek penggunaan tertinggi dan terbaik di bawah asas nilai saksama. Timbalan Pengarah Bahagian Penilaian dan Perkhidmatan Harta JPPH menyatakan:

> "Perakaunan akruan ni tujuan untuk nilai aset. Jadi nilai *as is* lah. Apa yang ada atas tanah, apa yang ada itu lah yang dinilai." (Responden 3)

Istilah *"as is"* yang disebut oleh Responden 3 mencerminkan intipati asas COV, yang berasaskan pengukuran aset bagi tujuan operasi, berpandukan cara penggunaan semasa, di lokasi semasa, dan dalam keadaan semasa. Sehubungan dengan itu, dari sudut kesesuaian aplikasi asas COV dalam konteks sektor awam di Malaysia, pakar yang ditemu bual berpendapat bahawa asas ini wajar digunakan, memandangkan amalan penilaian aset yang sedia ada sudah pun selari dengan konsep yang diketengahkan oleh COV.

Justeru, berdasarkan hasil kajian bagi objektif pertama, dirumuskan bahawa sesetengah jenis aset HLP, terutamanya bagi jenis aset tanah dan bangunan, asas pengukuran kos sejarah

[1]Istilah "kaedah kos dan perbandingan" ini adalah merujuk kepada kaedah/teknik penilaian untuk mendapatkan nilai pasaran aset yang digunapakai oleh JPPH (yang bertepatan dengan intipati asas COV). Istilah ini bukan merujuk kepada istilah kaedah kos seperti yang difahami dalam konteks perakaunan.

dilihat kurang sesuai digunakan walaupun dari segi praktikalnya asas tersebut merupakan kaedah paling mudah untuk digunakan. Hal ini kerana, asas tersebut mempunyai kelemahan yang ketara dari sudut menyediakan maklumat yang relevan berkaitan aset HLP, terutamanya bagi jenis aset tanah dan bangunan yang nilainya boleh jadi meningkat naik atau berkurangan berdasarkan faktor-faktor penggunaan dan pembangunan semasa. Semakan terhadap baki hayat berguna aset juga tidak dibuat secara berkala sehingga wujudnya keadaan aset dilaporkan pada nilai RM1 kerana telah habis disusut nilaikan walaupun aset masih digunakan dalam operasi seperti biasa. Sementara itu, asas nilai saksama yang menggunakan konsep nilai tertinggi dan terbaik mungkin kurang praktikal untuk diaplikasikan bagi kebanyakkan aset HLP kerajaan yang matlamatnya dipegang untuk tujuan operasi. Oleh itu, asas pengukuran COV dilihat sesuai digunapakai kerana ia bukan sahaja dapat memberikan maklumat aset HLP yang boleh menggambarkan keadaaan semasa aset, tetapi juga dari segi intipati amalannya ia telah diguna pakai oleh pihak JPPH dalam mendapat nilai semasa aset-aset kerajaan. Oleh itu, asas COV boleh dilihat sebagai jalan tengah untuk mengimbangi kelemahan asas kos sejarah dan juga isu kerumitan dalam pemakaian asas nilai saksama.

4.2 Objektif Kajian 2: Cabaran Pelaksanaan Pengukuran Susulan Aset HLP

Selanjutnya, kajian ini juga bertujuan untuk meneliti potensi cabaran dalam pelaksanaan pengukuran susulan aset HLP, terutamanya dari aspek asas COV, yang merupakan asas pengukuran baharu yang dicadangkan oleh piawaian antarabangsa.

Cabaran 1: Kos dan Beban Penilaian

Penggunaan pengukuran berasaskan nilai semasa, seperti COV memberikan beban penilaian kepada JPPH dalam menyediakan maklumat nilai aset. JPPH masih kekurangan tenaga kerja untuk menyiapkan tugas-tugas penilaian aset HLP kerajaan dengan cepat dan efisien. Oleh itu, kekurangan sumber tenaga kerja menjadi kekangan utama dalam pelaksanaan penilaian aset HLP, terutamanya jika polisi perakaunan memerlukan penilaian semula dilakukan secara berkala, seperti setiap lima tahun. Selain itu, isu kos dan beban penilaian ini akan menjadi lebih kritikal dalam konteks organisasi sektor awam yang terhad dari segi dana, kerana mereka perlu menanggung sendiri kos-kos operasi. Contohnya, dalam konteks entiti kerajaan tempatan, terutamanya bagi majlis daerah yang kecil dan mempunyai dana yang terhad. Seorang responden yang ditemu bual menyatakan:

> "Untuk PBT yang tidak ada *expertise* mungkin susahlah…kena *hire* orang luar *which is* harga yang lagi mahal dan mereka (PBT) tidak berkemampuan lah (untuk menanggung kos penilaian) …kalau dah masuk dalam MPSAS, semua PBT kena guna pakai tak kisah dia majlis bandaraya ke, majlis perbandaran ke majlis daerah. *So* kena *bear in mind,* majlis daerah, kemampuan kedudukan kewangan dia sangat *limited*. Kadang-kadang ada majlis daerah yang nak bayar gaji pun tak cukup, kena minta pinjaman dengan pejabat SUK kerajaan negeri...*so* katakan kalau kata nak dibuat penilaian semula 3 tahun sekali, memang beban lah kepada mereka. Kalau kata 5 tahun sekali, boleh kata

> *reasonable* lah untuk kawan-kawan saya di majlis daerah, saya bercakap bagi (konteks) PBT ya..." (Responden 7)

Selain daripada beban kewangan, pengukuran dan penilaian aset berasaskan COV juga akan memberi cabaran dari segi pengoperasian entiti sektor awam yang memiliki kapasiti (kakitangan, kemudahan teknologi) terhad. Responden yang sama menambah:

> "…untuk majlis perbandaran ataupun majlis daerah, mungkin seorang tu yang uruskan aset, dia lah yang uruskan belanjawan, dia lah yang uruskan hasil, dan dia lah yang uruskan bayaran. *So* dia mungkin tak termampu nak buat benda ni sebab benda ni bukan nak kata susah, tapi renyah prosesnya. Kita bukan bercakap untuk bilangan aset yang sikit..." (Responden 7)

Cabaran 2: Kepakaran Penilaian Aset Unik

Dapatan kajian turut mengenal pasti cabaran berkaitan kekurangan pakar penilaian dalam menilai aset-aset unik milik kerajaan, seperti aset warisan. Bagi tujuan penilaian aset ini, pihak JPPH perlu menambah jumlah tenaga pakar dan melatih kakitangan sedia ada agar boleh melaksanakan tugas penilaian terhadap aset-aset unik yang memerlukan kepakaran khusus. Langkah ini akan memberi implikasi kewangan terhadap operasi JPPH yang bertanggungjawab sebagai agensi tunggal dalam melaksanakan tugas penilaian aset. Pihak JPPH menyatakan kesediaan mereka untuk mendapatkan kepakaran khusus tersebut dengan melatih kakitangan sedia ada, namun hal ini pasti akan mengambil masa dan melibatkan kos latihan kakitangan yang perlu dirancang dengan sebaik mungkin.

Cabaran 3: Penentuan Baki Usia Guna

Salah satu cabaran utama dalam pengukuran susulan aset HLP di sektor awam adalah berkaitan dengan penentuan baki usia guna aset. Sehingga kini, terdapat kelemahan dalam menentukan baki usia guna aset, Ia menyebabkan banyak aset HLP kerajaan tidak disemak secara berkala. Dalam konteks perakaunan, semakan baki usia guna seharusnya dilakukan secara berkala untuk memastikan pengiraan susutnilai aset HLP dilakukan dengan tepat. Walau bagaimanapun, dalam amalan, semakan baki usia guna aset menjadi sukar disebabkan kekurangan pakar yang dapat memberikan anggaran tepat. Salah seorang responden kajian membincangkan isu ini dengan menyatakan:

> "Ada isu dimana usia guna tu pihak JPPH tidak dapat tentukan, contohnya untuk bangunan katakan dinilai untuk tahun 2024, tapi untuk *balance* usia guna tu mereka tiada kepakaran untuk kira sebab JPPH hanya beri penilaian hartanah itu sahaja. Kalau JKR pulak dari segi *engineering* dia *more on condition* bangunan sahaja tapi mereka juga tak dapat tentukan bangunan tu berapa lama boleh tahan untuk kita ubah (baki) usia guna bangunan tersebut… kami ikut sistem, akan guna *default by system*, (iaitu) baki maksimum. *So* aset bangunan tu akan dapat 50 tahun lagi tambahan (usia guna selepas penilaian

> semula)…sebenarnya Kementerian perlu ubah usia guna ni ikut berapa lama lagi bangunan tersebut, katakan dia dah guna 30 tahun, dia kena anggar lah katakan lagi 20 tahun lagi dia boleh guna. Atau pun kemungkinan dia ada penambahbaikan yang boleh menambah usia guna aset tersebut, *so* dia boleh lah (ambil kira).” (Responden 1)

Tambahan pula, aset HLP di sektor awam kebanyakannya mempunyai ciri-ciri khusus dengan penggunaan yang unik, menjadikan maklumat tentang aset yang setara sukar diperoleh bagi tujuan membuat perbandingan dan menganggarkan baki usia guna aset.

Cabaran 4: Sistem Maklumat

Cabaran pelaksanaan seterusnya adalah ketiadaan sistem maklumat dan rekod yang teratur di agensi yang mampu menyediakan data lengkap dan berintegrasi untuk memudahkan proses pengukuran aset HLP. Penggunaan model nilai semasa dalam pengukuran susulan aset HLP memerlukan sistem maklumat yang komprehensif dan berintegrasi, memandangkan jumlah aset HLP di sektor awam adalah sangat besar. Hal ini juga penting untuk menyokong proses penilaian oleh JPPH, kerana ketiadaan rekod aset yang lengkap dan dikemaskini pada peringkat pusat tanggungjawab menyebabkan proses penilaian aset menjadi lambat dan sukar dilaksanakan. Salah seorang responden pakar penilaian daripada JPPH yang ditemu bual membincangkan cabaran ini dengan menyatakan:

> “Bila kita terima senarai-senarai daripada agensi untuk tujuan penilaian ni, *sometime we noticed list* tu sebenarnya tak *up-to-date*. Contoh kalau pergi *site*, kalau ikut rekod atas tu sepatutnya ada lima bangunan, tapi bila tengoh eh ada lapan. Ataupun sepatutnya lima tapi tinggal tiga. *So* dia ada banyak kemungkinan lah, satu mungkin ada bangunan baru ataupun bangunan lama yang dah dilupus tapi secara fizikalnya sahaja dilupus. *On record* dia tak kemas kini. *Same goes to* geran atau hak milik dia lah, *sometime* mereka masih pegang hak milik yang lama, sedangkan tanah tu dah ada perubahan dari segi keluasan...ataupun ada yang ada tanah tapi geran pun tak tahu statusnya kat mana. *Things like that* memang jadi cabaran yang besar lah untuk nak buat penilaian...bayangkan bila kami minta *plan* bangunan, rekod dah hilang, tak lengkap *so* JPPH terpaksa ukur lah. *So* bila nak kena ukur, bangunan besar, memang ambil masa.” (Responden 4)

Oleh itu, jelas kelihatan wujudnya kelemahan dalam amalan penyimpanan rekod dan maklumat aset yang menjadi kekangan utama bagi proses penilaian. Isu ini perlu ditangani dengan sebaik mungkin jika asas COV ingin dipraktikkan. Penilaian semula akan menjadi suatu amalan rutin yang memerlukan sistem maklumat yang lengkap dan sentiasa dikemaskini.

Cabaran 5: Penggunaan Aset HLP Secara Cekap Dan Berkesan

Isu ini dapat dilihat dari dua (2) aspek, iaitu sebagai cabaran dan peluang untuk memperbaiki pengurusan aset kerajaan. Sekiranya asas pengukuran semasa, iaitu COV, digunakan, terdapat kemungkinan nilai aset akan mengalami penurunan yang signifikan ketika penilaian berkala dijalankan, terutamanya bagi aset-aset kerajaan yang tidak diselenggara dengan baik. Selain daripada isu penyelenggaraan, perancangan penggunaan aset yang tidak cekap dan berkesan juga akan menjadi cabaran yang boleh menyumbang kepada penurunan nilai aset di bawah asas COV. Seorang pakar penilaian aset yang ditemu bual mengutarakan isu ini seperti berikut:

> "Kita nampak masalah bagi aset-aset kerajaan ni dari segi *maintenance*. *Maintenance* nya teruk. Jatuh *value aset*. Tak jaga bangunan tu, bangunan terbengkalai, jadi 'gajah putih'. Tengok macam kuarters cikgu, kita nak nilai apa? Bangunan tak boleh guna...nilai tanah je lah...tahun 2013 bangunan baru, tahun 2024 dah takda nilai bangunan, tanah je. Jadi nilai jatuh lah, nilai bangunan takda, sebab bangunan tu tak boleh dah nak digunakan, tunggu nak robohnya. Nak roboh, jadi kos lagi kepada kerajaan, rugi pulak...jadi isu *maintenance* dan tidak ada perancangan yang betul..peningkatan nilai aset ni boleh berlaku bagi aset yang di *manage* dengan betul." (Responden 1)

Selain menjadi cabaran, isu ini juga boleh dilihat sebagai peluang untuk memperbaiki pengurusan aset kerajaan. Sekiranya asas COV dilaksanakan, ia memberi ruang kepada pihak kerajaan untuk meningkatkan akauntabiliti dan memperbaiki aspek pengurusan aset, sekali gus memastikan nilai aset-aset kerajaan dapat dikekalkan atau ditingkatkan.

Secara keseluruhannya, kajian ini telah mengenal pasti lima (5) cabaran utama dalam pelaksanaan asas COV dalam konteks entiti sektor awam di Malaysia. Seperti yang dibincangkan dalam hasil kajian pertama, asas COV berpotensi sebagai kaedah pengukuran susulan yang mampu mengimbangi kelemahan asas kos sejarah dan kerumitan asas nilai saksama. Namun, cabaran-cabaran pelaksanaan yang telah dikenal pasti perlu diberikan perhatian serius. Asas COV dilihat bukan sahaja berpotensi, malah dilihat sesuai untuk diguna pakai dalam pelaporan kewangan sektor awam. Walau bagaimanapun, pelaksanaannya dilihat akan dikekang oleh beberapa cabaran seperti beban penilaian, kekurangan kepakaran, keterbatasan sistem maklumat, serta kelemahan dalam perancangan dan penggunaan aset secara cekap dan berkesan. Cabaran-cabaran ini perlu ditangani secara menyeluruh agar penggunaan asas COV tidak menimbulkan polemik dari sudut pertimbangan kos dan manfaat. Seperti yang dihujahkan oleh Roje dan Redmayne (2020), isu-isu pragmatik yang berkait rapat dengan konteks semasa entiti sektor awam harus diambil kira dalam usaha menentukan asas pengukuran yang paling sesuai. Hal ini penting bagi memastikan objektif pelaporan kewangan dapat dicapai, iaitu untuk menyediakan maklumat yang telus dan relevan untuk pengguna dan memenuhi keperluan akauntabiliti sektor awam.

4.3 Objektif Kajian 3: Cadangan Kaedah Terbaik Pengukuran Susulan Aset HLP

Dalam melaksanakan pengukuran susulan aset HLP, secara keseluruhan perkara-perkara asas berikut perlu diambil kira oleh sesebuah entiti sektor awam. Pertama, selain pembuatan keputusan, tujuan penyediaan laporan kewangan entiti sektor awam adalah untuk tujuan akauntabiliti. Tujuan akauntabiliti ini adalah jauh lebih penting kepada pengguna-pengguna penyata kewangan yang juga merupakan pihak berkepentingan berbanding penilaian aset pada nilai semasanya, sama ada berasaskan nilai pasaran atau berasaskan keupayaan aset berkenaan menjana aliran tunai pada masa depan (Anessi-Pessina et al., 2022). Bagi tujuan akauntabilti, asas pengukuran susulan yang diguna pakai seharusnya dapat memberi gambaran sebenar penggunaan aset dan keadaan fizikal aset berkenaan.

Kedua, kebanyakan aset entiti sektor awam termasuk aset HLP tidak dipegang untuk kapasiti kewangan yang berupaya menjana aliran tunai daripada penjualan aset berkenaan pada masa depan. Justeru, tiada sebab yang signifikan nilai pasaran (nilai saksama) digunakan sebagai pendekatan pengukuran melainkan penjualan aset HLP tersebut besar kemungkinan akan berlaku pada masa depan. Aset sektor awam kebanyakannya dipegang dan dikekalkan untuk menyediakan manfaat sosial kepada rakyat. Dalam hal ini, aset warisan merupakan contoh yang ketara, di mana entiti pelapor memegang amanah untuk melindungi dan memelihara aset berkenaan bagi pihak generasi semasa dan akan datang. Fokus kepada nilai semasa boleh mendorong pengurusan sektor awam lari daripada memenuhi misi kesejahteraan sosial (Biondi & Oulasvirta, 2023).

Ketiga, pendekatan nilai saksama hanya sesuai kepada aset tertentu sahaja, iaitu aset yang dipegang untuk menjanakan pendapatan atau keuntungan pada masa depan atau bagi aset yang kapasiti perkhidmatannya adalah semata-mata berasaskan keupayaannya menjana tunai atau aset tersebut hendak dijual untuk menjanakan tunai. Berdasarkan perkara-perkara asas yang perlu dipertimbangkan ini, Jadual 2 menyenaraikan cadangan pengukuran susulan aset HLP sektor awam di Malaysia.

Cadangan yang dikemukakan dalam Jadual 2 dibuat berdasarkan analisis amalan pengukuran susulan negara-negara yang telah dikaji, terutamanya amalan di UK, Australia dan New Zealand yang mengguna pakai asas nilai semasa dan COV bagi aset jenis tanah dan bangunan dan menggunakan asas kos sejarah bagi kelas-kelas aset yang lain (Basnan et al., 2024), serta mengambil kira dapatan kajian daripada temu bual. Dalam cadangan tersebut, aset tanah dan bangunan diasingkan kepada aset tanah dan bangunan biasa atau umum dan aset tanah dan bangunan khusus, seperti amalan di UK dan New Zealand. Aset biasa atau umum bermakna aset tersebut ialah aset yang kegunaannya bukan mengkhusus untuk sesuatu tujuan tertentu sahaja. Contohnya, bangunan kerajaan yang digunakan sebagai pejabat, sekiranya tidak digunakan untuk tujuan pentadbiran kerajaan, aset tersebut boleh digunakan untuk tujuan lain, seperti bilik pameran atau boleh disewakan kepada syarikat swasta untuk operasi perniagaan. Aset khusus ialah aset yang digunakan semata-mata bagi tujuan khusus penyampaian perkhidmatan, seperti bangunan sekolah dan hospital. Reka bentuk bangunan hospital misalnya telah dikhususkan untuk memberi kemudahan kepada

pesakit dan penjagaan kesihatan dan bangunan tersebut tidak sesuai terus digunakan untuk tujuan lain sekiranya tidak lagi berfungsi sebagai hospital. Pengasingan kepada umum dan khusus dianggap sebagai dua kategori aset HLP yang berbeza dan ini membolehkan asas pengukuran berbeza digunakan. Manakala bagi aset tanah dan bangunan khusus, model nilai semasa, iaitu asas COV lebih sesuai digunakan kerana ia digunakan untuk semata-mata atau tujuan utamanya untuk penyampaian perkhidmatan. Aset tanah dan bangunan umum pula diasingkan sebagai kategori berbeza dengan aset khusus, maka aset yang penggunaannya bersifat umum ini boleh menggunakan sama ada asas COV atau nilai saksama.

Jadual 2: Cadangan Pengukuran Terbaik Aset HLP

Kategori/ Jenis Aset	Model	Asas
Tanah	Nilai Semasa	FV atau COV*
Tanah Khusus (contoh: hospital, sekolah)	Nilai Semasa	COV
Bangunan	Nilai Semasa	FV atau COV*
Bangunan khusus (contoh: hospital, sekolah)	Nilai Semasa	COV
Jentera dan Peralatan	Kos Sejarah	Kos Sejarah
Peralatan khusus (contoh: digunakan untuk penyelidikan/ R&D)	Nilai Semasa	COV
Kenderaan	Kos Sejarah	Kos Sejarah
Aset Dalam Pembinaan	Kos Sejarah	Kos Sejarah
Aset Pertahanan	Kos Sejarah	Kos Sejarah
Aset Komuniti		
Tanah taman rekreasi	Nilai semasa	COV
Peralatan mainan/ senaman dan struktur bangunan (gazebo)	Kos Sejarah	Kos Sejarah
Aset Infrastruktur	Kos Sejarah/ Nilai Semasa	Kos Sejarah/ COV
Aset Ketara Sumber Asli	Kos Sejarah/ Nilai Semasa	Perlu kajian lanjut
Aset Warisan	Kos Sejarah/ Nilai Semasa	Perlu kajian lanjut

Nota: *Bagi aset yang dipegang bagi pemberian perkhidmatan (kapasiti pengoperasian), COV adalah lebih sesuai.

Merujuk kepada Jadual 2 juga, peralatan khusus diasingkan sebagai kategori berbeza daripada jentera dan peralatan biasa. Berdasarkan hasil temu bual yang dijalankan, peralatan khusus ini merujuk kepada peralatan khusus yang digunakan untuk sesuatu penyelidikan tertentu. Mengikut amalan di entiti sektor awam pihak responden temu bual, pengukuran susulan aset peralatan khusus tersebut mengguna pakai asas kos sejarah, seperti mana aset jentera dan peralatan biasa. Apa yang menjadi kegusaran adalah, selepas aset tersebut disusut nilai sehingga habis usia guna yang ditetapkan, misalnya 20 tahun, aset tersebut secara fizikalnya masih utuh dalam kondisi yang baik dan belum dilupuskan tetapi diakaunkan pada nilai RM1. Justeru, berdasarkan situasi ini, dicadangkan peralatan khusus diasingkan kategorinya daripada jentera dan peralatan biasa, maka model pengukuran susulan dengan asas COV boleh diguna pakai. Jika asas COV digunakan, nilai peralatan khusus tersebut lebih mencerminkan keadaan semasa fizikalnya yang masih dalam kondisi baik. Penggunaan asas

pengukuran COV dapat menunjukkan kedudukan sebenar nilai aset entiti sektor awam dan dapat membantu memperbaiki pengurusan aset organisasi berkenaan.

Berdasarkan temu bual dengan penilai harta di JPPH, kaedah penilaian yang digunakan, terutamanya untuk aset tanah dan bangunan, menunjukkan bahawa intipati penilaian yang dilaksanakan oleh JPPH adalah selaras dengan konsep COV. Ini melibatkan pertimbangan terhadap penggunaan, lokasi, dan keadaan semasa aset, walaupun istilah COV tidak digunakan secara khusus oleh JPPH. Seterusnya, bagi aset komuniti yang merujuk kepada taman rekreasi atau juga dikenali taman awam (*public park*), menurut penilai JPPH, amalan semasa ialah hanya tanah taman tersebut yang dinilai. Bagi tujuan meningkatkan ketelusan dalam memberikan gambaran tepat terhadap ciri aset tersebut, dicadangkan untuk mewujudkan satu kategori berbeza, iaitu aset komuniti, yang akan diasingkan lagi kepada sub-kategori, seperti tanah taman rekreasi serta peralatan dan struktur bangunan yang terletak di atas taman tersebut, dengan asas pengukuran berbeza. Di samping itu, langkah ini juga dapat meningkatkan akauntabiliti entiti sektor awam, kerana ia merangkumi salah satu kategori aset unik yang perlu didedahkan secara jelas kepada pihak berkepentingan (Gaia & Jones, 2017).

Selain itu, seperti yang dicadangkan dalam Jadual 2, aset ketara sumber asli dan aset warisan memerlukan kajian lanjut tentang asas pengukuran dan teknik penilaiannya. Hal ini kerana aset sumber asli dan aset warisan merupakan jenis aset kompleks yang memerlukan pemahaman mendalam untuk merungkaikan aspek asas dari segi definisi dan ciri aset tersebut sebelum aspek pengukuran dan penilaian dapat dicadangkan (Aggestam Pontoppidan et al., 2024; Isa et al., 2024; Redmayne et al., 2023). Dalam konteks sektor awam di Malaysia, perakaunan bagi aset-aset tersebut perlu diperhalusi melalui kajian lanjut untuk menentukan asas pengukuran dan teknik penilaian yang sesuai. Bagi aset warisan pula, mengikut amalan di UK, Australia dan New Zealand, asas pengukuran susulan yang diguna pakai ialah sama ada kos sejarah dan nilai semasa dengan pendekatan pasaran (Basnan et al., 2024). Bagi menjawab persoalan sama ada asas pengukuran yang diguna pakai di negara-negara ini sesuai diaplikasikan dalam konteks awam di Malaysia atau tidak, kajian lanjut perlu dilakukan dengan mengambil asas pengukuran dan teknik penilaian yang lebih praktikal dan sesuai dengan jenis-jenis aset warisan yang terdapat dalam negara. Seterusnya, bagi aset ketara sumber asli, IPSASB baru-baru ini telah mengeluarkan deraf pendedahan bagi cadangan perakaunan aset berkenaan iaitu ED 92 *Tangible Natural Resources*. Menurut ED berkenaan, aset ketara sumber asli dicadangkan oleh IPSASB supaya diakaunkan sebagai aset kerana mempunyai unsur (*substance*) secara fizikal dan menepati ciri-ciri aset sektor awam, iaitu mempunyai potensi perkhidmatan dan menjana sumber ekonomi masa depan atau kedua-duanya. IPSASB mencadangkan bagi pengukuran awal, aset tersebut boleh diukur pada kos sejarah atau kos anggapan, manakala bagi pengukuran susulan pula pada kos sejarah atau nilai semasa. Oleh kerana perakaunan bagi aset ketara sumber asli ini baru diberi perhatian oleh IPSASB, adalah juga wajar dalam konteks sektor awam di Malaysia yang mempunyai sumber asli, seperti emas, bijih timah dan penemuan terkini *rare earth elements* (REE), kajian khusus tentang perakaunan aset ketara sumber asli termasuk aspek pengukuran dijalankan.

Berdasarkan cadangan yang ditunjukkan dalam Jadual 2 juga, asas nilai saksama adalah kurang sesuai digunakan dalam konteks sektor awam di Malaysia yang kebanyakan aset dipegang untuk tujuan penyampaian perkhidmatan. Penentuan nilai saksama berdasarkan penggunaan tertinggi dan terbaik (*highest and best use*) ini adalah rumit disebabkan banyak andaian yang perlu dibuat untuk mendapatkan nilai saksama aset tersebut. Asas nilai saksama berdasarkan penggunaan tertinggi dan terbaik ini mengikut pandangan pakar penilai di JPPH adalah lebih sesuai digunakan bagi kes-kes tertentu seperti penilaian aset bagi tujuan pengambil alihan tanah. Selain itu, boleh dirumuskan amalan pengukuran susulan yang mengguna pakai asas kos sejarah mempunyai beberapa kelemahan dan tidak sesuai, terutamanya apabila diaplikasikan bagi aset tanah dan bangunan. Dalam keadaan nilai aset berkenaan yang telah habis disusut nilai, amalan semasa ialah aset tersebut diakaunkan dalam penyata kewangan sebagai bernilai RM1 sedangkan aset berkenaan masih utuh dan digunakan dalam operasi. Ini tidak mencerminkan keadaan fizikal sebenar aset berkenaan. Walaupun asas kos sejarah sememangnya relevan diguna pakai, seperti yang diketengahkan oleh Biondi dan Oulasvirta (2023), kajian ini telah memberikan bukti bagaimana asas ini dilihat mempunyai kelemahan terutama bagi jenis aset tanah dan bangunan.

Dalam melaksanakan cadangan kaedah pengukuran susulan aset HLP beberapa kekangan dan cabaran, seperti yang telah dibincangkan dalam dapatan sebelum ini perlu ditangani. Pelan tindakan seterusnya yang wajar dilaksanakan adalah termasuk penambahan kakitangan tetap di JPPH yang diberikan latihan mencukupi untuk melakukan tugas-tugas penilaian yang semakin bertambah dan mencabar selain pelaburan ke atas sistem maklumat yang lengkap dan berintegrasi sekiranya cadangan asas nilai semasa sama ada COV atau nilai saksama (untuk aset tanah dan bangunan) diterima untuk diguna pakai. Sistem maklumat aset yang lengkap dan berintergrasi dan mudah diakses amat diperlukan bagi menyokong pelaksanaan pengukuran aset di bawah model nilai semasa yang memerlukan aset dinilai secara berkala. Bagi pengukuran dan penilaian aset warisan, pada masa ini JPPH masih belum mempunyai pakar untuk menilai aset berkenaan. Walau bagaimanapun, menurut dapatan kajian ini, JPPH bersedia untuk melatih pakar bagi menilai aset warisan. Justeru, dicadangkan agar jawatankuasa khas ditubuhkan yang terdiri daripada wakil pelbagai pihak berkaitan warisan untuk berfungsi dalam membuat pengiktirafan dan penilaian aset warisan bagi tujuan perakaunan dan pelaporan.

5.0 Kesimpulan

Kajian ini meneroka isu dan cabaran pelaksanaan pengukuran susulan aset HLP dalam konteks sektor awam di Malaysia. Secara rumusannya, kajian ini melaporkan kelemahan dalam pemakaian asas kos sejarah terutamanya bagi pengukuran aset jenis tanah dan bangunan. Walau bagaimanapun, asas kos sejarah sememangnya masih relevan untuk diguna pakai bagi kelas-kelas aset lain. Selain itu, asas pengukuran baharu yang dicadangkan oleh IPSASB dalam piawaian terkini yang diterbitkan, iaitu asas COV dilihat mempunyai potensi dan kelebihan untuk diguna pakai kerana dapat menggambarkan nilai semasa aset berdasarkan penggunaan semasa, malah sememangnya telah diaplikasikan oleh JPPH dalam menentukan

nilai aset kerajaan. Asas nilai saksama pula mungkin tidak sesuai bagi kebanyakan aset kerajaan kerana rumit untuk dilaksanakan.

Seterusnya, kajian ini juga telah menyerlahkan beberapa cabaran pelaksanaan yang perlu ditangani sekiranya kerajaan ingin mengguna pakai kaedah COV kelak. Antaranya termasuk cabaran dari segi kos dan beban penilaian, keperluan untuk mewujudkan sistem maklumat aset yang lengkap dan berintergrasi, serta perlu membuat penambahbaikan dan kawalan pengurusan aset agar dapat memastikan penggunaan aset HLP sentiasa dioptimumkan. Lanjutan daripada kupasan isu dan cabaran pengukuran susulan aset HLP, kajian ini juga telah mencadangkan asas dan teknik pengukuran yang sesuai untuk aset HLP sektor awam di Malaysia. Cadangan yang dikemukakan ialah berasaskan panduan piawaian, input daripada responden yang ditemu bual, serta berdasarkan penelitian amalan daripada negara-negara yang mengiktiraf aset HLP.

Kajian ini mempunyai beberapa limitasi yang perlu diambil perhatian oleh pembaca. Pertama, hasil kajian ialah berdasarkan input daripada sampel responden yang dipilih secara bertujuan berdasarkan latar belakang dan pengalaman khusus yang dimiliki berhubung pengukuran aset sektor awam. Walaupun dirasakan memadai untuk menggali maklumat untuk menjawab persoalan kajian, responden kajian terdiri daripada wakil beberapa entiti sektor awam sahaja. Justeru, kajian lanjut boleh dilaksanakan dengan menemu bual lebih ramai lagi responden bagi mendalami isu pengukuran aset HLP secara terperinci. Contohnya, kajian ini boleh dilanjutkan dengan menemu bual responden daripada kementerian dan agensi yang memegang aset-aset unik, seperti Kementerian Sains, Teknologi, dan Inovasi (aset-aset berteknologi tinggi), Kementerian Pelancongan (aset warisan), dan Kementerian Sumber Asli dan Kelestarian Alam (aset sumber asli). Selain itu, cadangan pengukuran yang dikemukakan dalam hasil kajian ini masih dianggap sebagai cadangan awal. Justeru, aspek ini perlu diteliti dengan lebih mendalam dalam kajian lanjutan agar dapat menyumbang sebagai input berguna bagi membentuk polisi dan menyokong pelaksanaan pengukuran susulan aset HLP di sektor awam.

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Exploring Artificial Intelligence (AI) Integration in Malaysian Public Accounting: Qualitative Insights and Readiness Assessment

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Abstract

Purpose: This study aims to understand the complexities and nuances surrounding artificial intelligence (AI) integration within the context of Malaysian public sector accounting. By exploring the perspectives and experiences of key stakeholders, this research seeks to contribute to the development of strategies for successful AI implementation in the sector.

Design/ Methodology/ Approach: A qualitative research approach, involving semi-structured interviews with 18 public sector accountants, was employed to comprehensively explore their experiences, perceptions and challenges of AI adoption.

Findings: Findings indicate a foundational understanding of AI's potential amongst public sector accountants, with its application envisioned for automating repetitive tasks, reduce manual process, and perform data analytics. While challenges such as system integration, network disruptions, and resistance from senior accountants hinder implementation, participants' express optimism about AI's role in enhancing efficiency and decision-making. This positive outlook is coupled with an expectation of reallocating staff towards higher-value functions like internal controls and auditing.

Research Limitations/ Implications: The study's limitations arise primarily from its sample size of 18 participants and the focused selection of public

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departments. This restricted scope may constrain the generalisability of the findings to the broader spectrum of Malaysian public sector accounting services.

Practical Implications: By identifying key challenges and opportunities, policymakers can establish guidelines and frameworks for a phased approach, prioritizing departments with the necessary infrastructure and human capital. This strategic approach will facilitate the seamless integration of AI, maximizing its benefits while mitigating potential risks.

Originality/ Values: As an early exploration in this field, this study offers valuable insights that may assist policymakers in developing a strategic roadmap for AI implementation within the Malaysian public sector accounting domain.

Keywords: Public sector accounting, AI adoption, accounting information systems (AIS), Malaysia

1.0 Introduction

The rapid evolution of AI is reshaping industries worldwide, and accounting is no exception. In the public sector, where financial reporting and service delivery are often constrained by manual processes and outdated systems, AI-powered accounting solutions hold the potential to enhance efficiency, reduce errors, and support data-driven decision-making (Brown et al., 2020). However, successful AI adoption depends not only on technological advancements but also on the readiness of accountants to embrace and integrate these innovations into their workflows.

Despite the increasing interest in AI adoption within the accounting sector, research specifically examining the readiness of accountants in the Malaysian public sector, particularly concerning AI-embedded accounting systems, remains limited. Public sector accounting often relies on manual data entry and processing of invoices, receipts, and other financial documents. This process is time-consuming, prone to errors, and can lead to delays in reporting (Saleh et al., 2021). Moreover, legacy accounting systems may not be integrated, requiring manual data transfer between different platforms, which further increases the risk of errors and inconsistencies (Carlsson-Wall et al., 2022). The sheer volume of data in public sector accounting can be overwhelming, making it difficult to identify trends and patterns without the help of data analysis tools (Wirtz et al., 2018). Public sector entities often face budget limitations, making it difficult to invest in modern accounting technologies and hire highly skilled accounting professionals (Wirtz et al., 2018). Additionally, keeping up with a constantly evolving set of regulations and standards can be a challenge for under-resourced accounting teams (Saleh et al., 2021). AI integration in public sector accounting promises to transform these processes,

enhance decision-making, and improve overall efficiency and effectiveness (Ahn & Chen, 2022; Wirtz et al., 2018).

Information technology (IT) has already had a significant impact on public sector accounting and auditing. Innovation in this field has been extensively reviewed, highlighting both the opportunities and challenges (Criado et al., 2023). Similarly, the broader impact of IT on public sector performance underscores the transformative potential of these technologies. However, resource constraints, such as limited budgets and insufficiently skilled personnel, remain significant barriers (Ahn & Chen, 2022).

With the Malaysian government actively promoting AI integration across various sectors (e.g., Malaysia National Artificial Intelligence Roadmap 2021-2025, 'AI untuk Rakyat,' and AI Sandbox 2024), understanding the preparedness of public sector accountants for AI adoption is critical. It is essential to consider the factors influencing AI adoption in the accounting field, particularly within the public sector, to ensure successful integration and address potential obstacles (Wael, 2023). While AI offers numerous advantages, such as improved decision-making and efficiency, attention must be paid to the accountability of AI algorithms in the public sector to ensure transparency and ethical use of AI technology (Bracci, 2022). Furthermore, the evolving regulatory landscape adds another layer of complexity to public sector financial reporting (Saleh et al., 2021).

This study aims to fill the gap in knowledge by exploring the awareness and readiness for AI adoption amongst accountants in Malaysian government departments. Employing a qualitative approach, this research involves semi-structured interviews with 18 public sector accountants to delve into their experiences and perceptions regarding AI integration. By examining their insights, this study seeks to identify key factors influencing AI adoption, including challenges and opportunities.

Understanding the awareness and readiness of Malaysian public sector accountants towards AI adoption provides valuable insights for future policy decisions and capacity-building initiatives. Recognising the current state of preparedness will aid policymakers in developing targeted training programmes to enhance accountants' knowledge and skills in working with AI-powered accounting systems. Moreover, addressing potential concerns and fostering a positive attitude towards AI can facilitate a smoother transition and maximise the benefits of AI for Malaysia's public accounting sector. This research contributes to the growing body of knowledge on AI adoption within the accounting profession, with a specific focus on the unique context of the Malaysian public sector. Qualitative research, with its in-depth exploration of participant experiences, provides richer insights into the nuanced challenges and opportunities of AI integration, capturing the complexities that quantitative methods may overlook (Creswell & Poth, 2016).

2.0 Literature Review

The public sector is experiencing significant transformations due to the rapid advancements in AI. AI technologies are revolutionising public sector accounting by automating tasks, improving data accuracy, and allowing professionals to focus on more strategic roles (Brown et al., 2020; Fedyk et al., 2022). However, the impact of AI extends beyond accounting, influencing various aspects of public service delivery, where it promises to enhance efficiency, accuracy, and citizen satisfaction.

AI technologies offer substantial benefits in public sector accounting, such as automating repetitive tasks, generating real-time insights, and improving decision-making capabilities (Cifuentes-Faura, 2024; Mat Hussin et al., 2024). For instance, Machine Learning (ML) algorithms are being used for automated data entry, classification, and anomaly detection, which reduces manual errors and streamlines data processing tasks (Dickney et al., 2019). This is particularly valuable in a public sector context where manual data entry and processing are still prevalent, leading to delays and errors (Ahn & Chen, 2022). Similarly, robotic process automation (RPA) is effectively automating tasks such as invoice processing and data reconciliation, freeing accountants to engage in more strategic activities (Brown et al., 2020).

Beyond accounting, AI has transformative potential in public service delivery. AI-powered chatbots and virtual assistants are increasingly deployed to provide 24/7 support to citizens, answering frequently asked questions, guiding users through processes, and scheduling appointments. This not only improves the efficiency of service delivery but also enhances citizen satisfaction by providing immediate assistance (Wirtz et al., 2021). Moreover, AI systems can automate the processing of applications for licenses, permits, and other services, thereby reducing manual workloads, minimising errors, and significantly shortening processing times for citizens (Bannister & Connolly, 2020; Mergel et al., 2019).

AI also plays a critical role in proactive service delivery. For instance, AI can analyse data to identify citizens who may need specific services, such as job training or healthcare assistance. This capability allows public sector agencies to engage in proactive outreach and early intervention, leading to better outcomes for individuals and communities (Janssen et al., 2020). Furthermore, AI can be used to detect fraudulent activities within public programmes by analysing data to identify patterns and anomalies. This helps prevent the misuse of public funds and ensures that resources are directed to those who truly need them.

The integration of AI in public sector operations, including accounting and broader service delivery, presents both opportunities and challenges. On the one hand, AI technologies such as natural language processing (NLP) enhance efficiency by extracting data from unstructured financial documents and reports, reducing the time spent on manual data entry (Ahn & Chen, 2022). On the other hand, the implementation of AI in the public sector requires a deep understanding of the contextual factors that influence its adoption, such as public management practices, agency characteristics, and the involvement of individual employees (van Noordt & Misuraca, 2020).

AI role in public service delivery also highlights the need for ethical considerations and the management of risks associated with AI-driven decisions. Ensuring reliable AI in the public sector involves assessing risk acceptability and maintaining accountability, especially in sensitive areas like fraud detection and citizen interactions (Kindzeka, 2023; Loukis et al., 2020). As AI systems take on more significant roles in public sector operations, effective human oversight becomes essential to ensure that these technologies are used responsibly and transparently (Sterz et al., 2024).

Public sector organisations often face unique challenges when adopting AI technologies, such as budget limitations, legacy systems, and the need to comply with an evolving regulatory environment (Saleh et al., 2021). For example, AI adoption in public sector accounting is complicated by the sheer volume of data and the need for advanced analytics to identify trends and patterns (Wirtz et al., 2018). Similarly, in broader public service delivery, the integration of AI technologies requires careful planning to ensure that these systems are accessible and beneficial to all citizens, including those in underserved communities (Mergel et al., 2019).

A crucial factor influencing AI adoption in public sector accounting is the level of readiness amongst accountants. Studies suggest that while AI awareness is growing amongst finance professionals, many public sector accountants remain hesitant due to limited exposure and lack of formal training on AI applications in accounting (Fedyk et al., 2022). Resistance to change is also a common challenge, as employees may perceive AI as a threat to job security rather than a tool for improving efficiency (Sterz et al., 2024). Addressing these concerns through structured training programmes and change management strategies is essential for successful AI implementation (van Noordt & Misuraca, 2020).

Although previous studies have explored AI adoption in accounting and public service delivery (Brown et al., 2020; Mergel et al., 2019), limited research has examined AI readiness amongst accountants in the Malaysian public sector. Most existing studies focus on AI's technical capabilities or broad policy implications, rather than on how accountants themselves perceive and adapt to AI technologies. This study fills that gap by exploring the lived experiences of public sector accountants, providing insights into their preparedness, challenges, and expectations regarding AI adoption.

While quantitative studies offer broad trends and statistical relationships, qualitative research provides deeper insights into the nuanced challenges and opportunities of AI adoption in the public sector. Through semi-structured interviews and open-ended discussions, qualitative research can uncover the specific concerns, expectations, and readiness of public sector employees, including accountants and service delivery professionals, towards AI adoption (Creswell & Poth, 2016). This approach is particularly valuable in understanding how individual employees perceive the impact of AI on their roles and the ethical implications of AI-driven decisions in public administration (Sterz et al., 2024).

This literature review underscores the significant benefits and challenges of AI integration in both public sector accounting and broader public service delivery, with a particular focus on the

Malaysian context. By leveraging qualitative research methods, this study aims to provide a comprehensive understanding of the experience, perceptions and challenges of public sector employees regarding AI adoption. This approach will contribute valuable insights to the ongoing dialogue on AI implementation in government settings, ensuring that policies and practices are informed by the experiences and expectations of those at the forefront of this transformation.

2.1 Current AI Applications in Selected Countries

The development of AI in public sector operations become a global trend and widely utilised in both developed and developing countries. The nations have a strong believe that AI can enhance efficiency, decision-making, and service delivery. However, the extent of utilisation varies across countries due to cultural, infrastructure, regulations and the level of digital maturity.

The way different countries are leveraging AI in the public sector has been explored. The authors have selected samples from both emerging (China and India) and developed countries (Singapore and Australia) to identify the extent of AI implementation in terms of guideline or framework availability, usage of AI in public service and delivery also application of AI in audit and accounting field.

2.1.1 China

a) Guideline or Framework

China has issued Governance Principles for the New Generation Artificial Intelligence: Developing Responsible Artificial Intelligence in 2019 to guide the healthy development of AI generation (SAI2, 2023).

The country also produced a draft law on generative AI called ‘Interim Measures for the Administration of Generative Artificial Intelligence Services’, to protect data privacy and intellectual property for generative AI systems delivered to the public (Hankins et al., 2023).

b) Public Service and Delivery

The country embeds AI in the customer service function in e-government public services to improve efficiency and customer experience. AI customer service utilise speech recognition and conduct real-time semantic analysis to enable interaction with customers through open voice guidance. This technology not only assists customer meeting their needs quickly and improve public satisfaction but recognise user requests and connect to the government knowledge database to deliver accurate responses (SAI2, 2023).

c) Audit and Accounting

Audit function use AI technologies for several audit processes such as using optical character recognition (OCR) to convert hardcopy documents into digital data, applying data mining to detect fictitious bidding in government procurement process and utilise digital audit archives to store the documents.

2.1.2 India

a) Guideline or Framework

Release India AI 2023 and National AI Strategy 2021 which serves as guidance for the integration of AI into the public sector including AI governance, data management, and strategic partnerships to foster innovation and technological advancement (Hankins et al., 2023).

b) Public Service and Delivery

India becomes regional leader for South & Central Asia for AI adoption in public sector. The use of AI is growing, amongst them is the use of chatbot, together with enhanced features, such as enrolment/ update status, enrolment centre location, complaint registration, and tracking in the Indian biometric ID system (Hankins et al., 2023). The government also introduced 'Bhashini,' which enables the public to access the internet and digital services in their location (SAI2, 2023).

c) Audit and Accounting

The government introduced an AI-supported portal to support pension payment, tracking, and sending automatic alerts to pensioners. The portal also receives inputs from users regarding suggestions and complaints with a prompt response (SAI2, 2023). Similar to the problem faced by China in the procurement process, the government of India faces collusion issues from bidders during the tendering process which contributes to anti-competitive practices. The solution is to introduce a graph algorithm for detecting collusion cases in procurement tendering (SAI2, 2023).

2.1.3 Singapore

a) Guideline or Framework

Development of a National AI Strategy in 2019 to outline government plans to deepen the use of AI for driving global innovation and for the public good. Singapore also launched the Model AI Governance Framework during the same year in 2019 as a guidance to AI developers and users on the ethical and responsible manner in the design and utilisation of AI (NAIS,2023).

b) Public Service and Delivery

Amongst the utilisation of AI in public service and delivery is the utilisation of chatbot to submit complaints and issues relating to littering, illegal parking which can automatically classify complaints into the appropriate category for follow up by appropriate authority. Besides, AI technology is used to support immigration, customs clearance and deter online scams (NAIS, 2023). For instance, the hospital to home (H2H) programme employs AI models to predict patient readmissions, thereby guiding community care interventions for individuals with complex health conditions (Abisheganaden et al., 2023).

c) Audit and Accounting

The use of AI in public sector accounting is still new and under development. For the time being, the government utilise government resource planning (GRP) that integrate various government functions to implement effective management and information system to support government infrastructure. Besides, tools such advanced data mining (ADM) which employ AI-powered technology used to extract insights from large datasets to inform strategic decisions. There are many potential AI technology in the pipeline that are in plan to serve critical accounting work functions to be implemented both in public and accountancy industry (ISCA, 2023).

2.1.4 Australia

a) Guideline or Framework

The Australian government has developed policies and framework for the responsible use of AI and gain public confidence. For example, Policy for the Responsible Use of AI in Government implemented recently on 1 September 2024, which issued in June 2024 and will undergo for pilot testing throughout year 2024 to identify and manage use case with associated risks. In addition, the digital transformation agency (DTA) under Australian Government is developing AI technical standards to connect Australian Public Service with machine learning expertise through a cross-government working group to ensure safe and responsible AI in Australia (DTA, 2024).

b) Public Service and Delivery

Consistent with few other countries, Australia also uses chatbots for public services to provide prompt responses, reduce human workloads, utilise predictive analytics tools to analyse public feedback and identify patterns and trends that inform policy-making. Learning from previous outbreaks, the government applies predictive analytics in healthcare to predict disease outbreaks, aiding in timely interventions. Besides, AI-driven diagnostic tools and patient management systems are also being implemented in servicing healthcare patients (O'Keeffe, 2023).

c) Audit and Accounting

The generative AI (gen AI) is continuing to evolve in Australia. Its usefulness in the accounting field can be seen to improve the accuracy of financial analysis, serve as a virtual assistant for real-time document verification, and generate risk assessment summaries from diverse data sources. The AI-enabled software is also used to ingest financial reporting and detect fraud and data anomalies. On top of that, the use of AI chatbots, such as ChatGPT automate research, data analysis, forecasting and provide audit support for accountants (Bradley et al., 2024).

3.0 Research Design

This study employed a qualitative research design utilising semi-structured interviews to explore the experiences, perceptions, and challenges of AI adoption amongst accountants in Malaysian government departments.

3.1 Participants

The interviews were conducted through physical meetings when possible and online sessions as needed, focusing on senior accountants within the most significant public service departments. Over a 3-month period from May to July 2024, a total of 11 interview sessions were held with 18 participants. This diverse group represents a broad spectrum of positions, departments, services, and regions within Malaysia's public sector. The participants included Heads of Finance Units, Senior Accountants, and Deputy Treasurers from various ministries, national audit bodies, customs departments, and educational institutions, covering states, such as Kelantan, Terengganu, Johor, Selangor, and the Federal Territories.

The following Table 1 summarises the participants, detailing their respective ministries, positions, and modes of interviews:

Table 1: List of Interview Participants

No.	Ministry/ Department/ Agency	Name	Position	Interview Date/ Time	Mode
1.	Hospital Dungun, Terengganu	Cik ZY	Head of Finance Unit	12.05.2024 (10:00 AM)	Online
2.	National Audit Department (HQ)	Dr. MD	Deputy Director of ICT Audit	20.05.2024 (10:00 AM)	Face to face
3.	Royal Malaysian Customs Department (HQ)	Pn. RI Pn. NJ Pn. AA	Accountant	05.06.2024 (10:00 AM)	Online
4.	Accountant General's Department (Terengganu)	Pn. AR	Deputy Director of Accountant General	23.05.2024 (2:00 PM)	Face to face
5.	UiTM Machang	Pn. ZH	Deputy Treasurer	04.06.2024 (11:00 AM)	Face to face

Table 1: Table 1: List of Interview Participants (continued)

No.	Ministry/ Department/ Agency	Name	Position	Interview Date/ Time	Mode
6.	Ministry of Transport Malaysia	Pn. NA En. AT Pn. NAM Pn. SR	Senior Accountant	14.06.2024 (10:00 AM)	Face to face
7.	Hospital Sultanah Aminah, Johor Bahru	Pn. MM	Senior Accountant	30.05.2024 (2:00 PM)	Online
8.	Treasurer of Terengganu	Pn. RH	Assistant State Treasurer	10.06.2024 (3:00 PM)	Face to face
9.	Treasurer of Selangor	Dr. SB	Treasurer	24.06.2024 (2:30 PM)	Face to face
10.	UKM (The National University of Malaysia)	Pn. NAJ Pn. H Pn. ZM	Finance Officer, IT Officer	13.06.2024 (2:30 PM)	Online
11.	Ministry of Human Resources	Pn. ZAH	Head of Finance Unit	24.06.2024 (2:30 PM)	Online

3.2 Data Collection

This study collected data through semi-structured interviews with accountants from various Malaysian government departments. The interviews were chosen to gain a deeper understanding of participants' awareness, readiness, and attitudes towards AI adoption in public sector accounting. Additionally, the authors explored their experiences with accounting tasks and public service delivery, ensuring that their insights were both relevant and informed by practical experience.

The interviews were conducted both face-to-face and online, depending on participants' availability. Given the preference for Bahasa Malaysia in the Malaysian public sector, most interviews were conducted in this language. This allowed participants to express their views comfortably, contributing to richer and more accurate data. The semi-structured format offered flexibility, enabling the interviewer to probe deeper into specific areas of interest that emerged during the discussions. Each interview lasted approximately 45 minutes to an hour and was recorded with participants' consent to ensure the accuracy of transcription and analysis.

The interview guide was developed based on the study's objectives and was informed by existing literature on AI adoption in public sector accounting. Questions were designed to explore participants' perceptions of AI, their readiness for its integration into their work processes, and the challenges and benefits they anticipated. The participants were asked about their experiences with accounting tasks and public service delivery, including their familiarity with current accounting systems and how public sector reforms have impacted their work. These insights were essential to ensure that the participants' perspectives were grounded in real-world experience and relevant to the study's focus.

The collected data were transcribed and analysed by using thematic analysis, which helped identify key themes and patterns across the interviews. This method provided a comprehensive exploration of the factors influencing AI adoption in the Malaysian public sector and offered valuable insights into the experiences and perspectives of public sector accountants.

3.3 Data Analysis

The data collected from the semi-structured interviews were analysed by using thematic analysis, a method well-suited for identifying, analysing, and reporting patterns (themes) within qualitative data. To assist with this process, the authors used QualCoder 3.5, a qualitative data analysis software that allowed to efficiently manage and code the interview transcripts.

The thematic analysis followed the framework outlined by Miles et al. (2019), which involves several key stages: data reduction, data display, and conclusion drawing/ verification. In the data reduction phase, the authors carefully reviewed the interview transcripts, identifying important statements and assigning initial codes. These codes were then grouped into broader categories, representing the main themes that emerged from the data. This systematic approach ensured that the analysis remained focused on the participants' experiences while also allowing for the identification of patterns and connections across the dataset.

Using QualCoder 3.5, the authors were able to assign and manage codes efficiently, which made it easier to refine categories and themes throughout. The software’s features, such as code frequency analysis and code co-occurrence matrices, helped in identifying the most important themes and their relationships, contributing to a thorough analysis. The identified themes and their operational definitions are given in Table 2.

Table 2: Identified Themes and Operational Definitions

No.	Theme	Operational Definition	Category
1.	Awareness of AI	Participants' understanding and knowledge of AI and its applications in accounting	Awareness
2.	Technology Gaps in the Accounting Module	The deficiencies or limitations in the current technological tools and systems used	Perceived Challenges
3.	Infrastructure and Resources	The state of infrastructure and availability of resources within public sector departments to support AI	
4.	Lack of Clear Guidelines	The absence of formal policies or frameworks guiding AI adoption	
5.	Resistance to Change	Reluctance or opposition from staff, especially those less comfortable with new technologies	
6.	Lack of a Defined Purpose for AI Adoption	Does not have a clearly defined purpose or goal for implementing AI	
7.	Efficiency Improvements	AI potential to streamline processes and reduce manual workloads	Perceived Opportunities
8.	Enhanced Decision-Making	The ability of AI to provide valuable insights through data analytics and forecasting	
9.	Reallocation of Tasks	The opportunity to shift staff from mundane tasks to more strategic roles	
10.	Long-Term Integration Plans	Participants' expectations regarding the gradual integration of AI into their work	

The final stage of the analysis involved reviewing the themes to ensure they accurately reflected the data and the study's research questions. Then these themes were combined to draw clear conclusions about the factors influencing AI adoption in Malaysian public sector accounting. This approach allowed the authors to present a clear understanding of the participants' perspectives, based on the detailed qualitative data obtained from the interviews.

4.0 Findings

From the analysis of the interview data, the key findings are presented under three (3) themes: Awareness, Perceived Challenges, and Perceived Opportunities. These themes are divided into 10 sub-themes: Awareness of AI, Technology Gaps in the Accounting Module, Infrastructure and Resources, Lack of Clear Guidelines, Resistance to Change, Lack of a Defined Purpose for AI Adoption, Efficiency Improvements, Enhanced Decision-making, Reallocation of Tasks and Long-term Integration Plan.

As shown in Figure 1, the findings revealed that Perceived Challenges were mostly raised amongst the participants. The sub-themes that emerged from this category by order of frequency are Technology Gaps in Accounting Module (28), Long-Term Integration Plan (20), Infrastructure and Resources (20), Resistance to Change (9), and Lack of Clear Guidelines (6). In addition, Increased Efficiency emerged as the popular sub-theme of Perceived Opportunities while Awareness remains without a sub-theme.

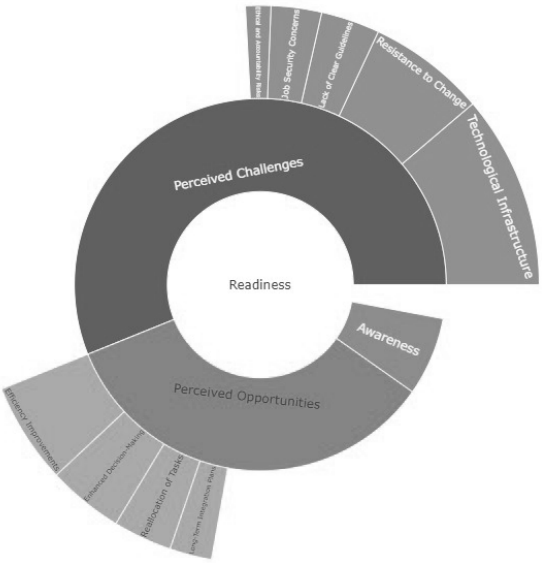

Figure 1: Thematic Structure of AI Readiness

4.1 Awareness of AI

As the technology continues to evolve, raising awareness about AI technology amongst public sector accountants is very crucial. One of the concerns that was raised during the interview sessions with participants were the understanding of the AI concept and the benefits that the technology could bring to the users. The understanding of AI concept, potential benefits and drawbacks that the technology can bring is essential before implementing it in Malaysian public sector. Besides, the interview also explored the level of awareness and frequency of training programs received by the accountants in line with the Malaysia National Artificial Intelligence Roadmap 2021-2025. This section explores the level of awareness amongst the participants regarding AI concepts as general and the level of awareness received during their duty as government servant. One of the participants, Pn. RI provided her view on the understanding of the AI concept:

> "AI is expected to streamline daily tasks in meeting our operational execution. While the implementation of AI involves a certain level of complexity, the technology brings a lot of benefits to users, particularly to accountants, especially in review processes. The robotic technology capability can perform

> tasks quickly and automatically. We however noted some challenges in the implementation, especially for those departments dealing with various laws and regulations, whereby some degree of human intervention is required in certain areas due to the complexities of the laws and regulations that cannot be embedded directly into the technology." [translated]

In terms of awareness, there are a growing number of training programmes about AI technology being spread to public sector accountants despite of its implementation which is under the planning process. This circumstance is further explained by Pn. NJ:

> "The awareness provided to public sector accountants to my knowledge is in the form of awareness training. Many seminars, talks, and forums have focused on awareness and discussions about AI recently, whether it is held physically or digitally. I can see the exposure to advanced AI technology becoming increasingly widespread. However, full implementation is yet to be executed for user experience. As a result, we only understand the concept of technology but haven't experienced the extent AI technology can penetrate the market or any sector. So far, we only heard about the potential of the great things AI can do, for example, certain tasks can be taken over by robotic technology. In terms of user awareness, I believe Accountant General (AG) continuously takes initiative to supply us with appropriate information about AI." [translated]

4.2 Perceived Challenges

There are few potential challenges that could arise on the implementation of AI in public service departments. Since AI has yet to be fully implemented, the authors explored insights from participants on the expected challenges they anticipate based on experience, knowledge, and current practices. These perceived challenges were categorised into several sub-themes include Technology Gaps in the Accounting Module, Infrastructure and Resources, Lack of Clear Guidelines, Resistance to Change, and Lack of a Defined Purpose for AI Adoption. This section explores the perceived challenges expected by the participants in relation to integrating AI technology into current system.

4.2.1 Technology Gaps in Accounting Module

The gaps in current technology used in the operational and accounting system by the public sector need to be further investigated before the initiatives to implement advanced technologies take place. These gaps often include relying significantly on manual process, underutilisation of currently available modules in accounting systems, lack of integration between the systems used by the departments, and the need to comply with the complex regulation requirements that hinder the effort to utilise advanced technologies. The expected consequences from the failure to mitigate the mentioned gaps are repetitive errors, compatibility issues during the integration process, noncompliance with regulations, delays in daily operational activities,

and thus affects the decision-making process. A thorough analysis of the technology gaps used by current departments needs to be further investigated to ensure the advanced technology to be adopted can fully benefit the users and support accountability of public sector accounting.

Amongst accounting systems currently utilised by public service departments include the Integrated Government Financial Management Accounting System (iGFMAS), Sistem Perakaunan Akruan Kerajaan Negeri (iSPEKS), and customised versions of the Standard Accounting System for Government Agencies (SAGA). The main challenge faced by public accountants is the lack of system integration, particularly the iGFMAS and iSPEKS system which caused redundant work to be performed, manual tasks exposed to numerous errors and time consuming, also inefficacy in performing daily tasks due to lack of automation. En. AT sharing his experience as a user of current technology:

> "The challenge we face currently as accountants is the inability of the systems, we currently use to integrate each other due to compatibility issues. The lack of integration leads us to perform double work in our daily activities." [translated]

He further added:

> ".... So far, we haven't seen significant efforts to integrate these systems. The integration is significant for us as we strive to avoid errors. When those systems are not integrated, we will be exposed to repetitive errors which become a major issue." [translated]

This view is further supported by Pn. MM, who dealt with daily operations using iGFMAS. Lack of integration leads to inefficiencies and requires additional manpower to perform daily tasks, including collection of revenue, recording of transactions, payment processing and dealing with recurring transactions. She further clarified this statement by stating the following:

> "...There are many public hospitals in Malaysia, but not all hospitals are linked to the iGFMAS system for revenue collection. Although the amounts collected might be small, such as RM1, RM2, or RM5, some hospitals manage to collect significant amounts of revenue. Problems arise when the accounting system and the revenue collection system are not integrated, requiring additional staff to verify the revenue to complete the revenue collection process. In my opinion, this is a waste of time. For smaller hospitals, one person might be sufficient, but larger hospitals might need two to perform this process." [translated]

Another participant, Pn. ZY opined that:

> "The hospital is currently using a stand-alone operating system and not integrated with iGFMAS. The lack of integration between systems makes the verification of information becomes difficult. For example, if we want to verify the payment received from a person or to verify if the person is eligible for any

> discount, we need to check through our operating system and then refer to iGFMAS to confirm whether the payment has been received or the person is eligible for a discount." [translated]

Government departments handle voluminous transactions daily. Despite the lack of integration, several daily operations still rely on manual processes that could hinder operational efficiency and cause delays in transaction processing. Pn. AR explained:

> "The payment process at the Centres of Responsibility (PTJ) still relies on manual processes. For example, in PTJ's system, when dealing with high-volume transactions such as payments for books or supplies from a vendor with large amounts of transactions, the transaction process in iGFMAS becomes very high. This process involves thorough manual checking by staff to ensure delivery dates of supplies match the contract. Subsequently, each transaction must be reviewed one by one to confirm the accuracy before it is entered into the system, accepted, and approved for payment processing. This manual process is very time-consuming due to detailed verification procedures that need to be done." [translated]

The manual process is extended to the preparation of monthly reporting, making the process time-consuming and less efficient. The practice limits the accountant's focus on strategic task like data interpretation and thorough financial analysis, limiting their professional value to public accounting practices. Pn. ZAH responded on this issue by explaining:

> "Preparation of financial statements is still done manually using formatted Microsoft Excel. The information is derived from trial balance in the system and requires manual updates to generate the notes and other necessary data. Ideally, it should be automated and generated based on data from iGFMAS. At this stage, the role of accountants should be more focused on interpreting data and performing in-depth analysis. However, we still require accountants to prepare these financial statements manually." [translated]

4.2.2 Infrastructure and Resources

The successful implementation and integration of AI technology in public sector accounting systems and service delivery processes require good infrastructure and availability of resources. The good infrastructure includes server capacity which can handle large volumes of data, hardware and software compatible with the latest technology, a digital platform for data storage, and adequate cybersecurity policy in place to protect data privacy. Huge amounts of investments are required to initiate the technology implementation, besides adequate training to develop digitally skilled staff at all levels in ensuring the efficiency and full utilisation of AI technology in public sector accounting and service delivery processes. Pn. RH opined that:

> "The challenges in implementing AI technology in current operational and accounting system is the investment costs to develop and implement systems embedded with AI technology, and the training costs to the users on how to use the AI-integrated system." [translated]

Pn. H further elaborated on the importance of having adequate digital storage systems:

> "Storing documents in the digital platform is part of the digitalisation effort in eliminating the physical files storage. We need to assess and determine how these documents will be stored and organised digitally to ease searchability, and the acceptance during the course of audits. We are looking for benchmarks for the best practices to implement this effort, especially to align with archival requirements and relevant laws. Finally, we need to ensure the National Audit Department can accept documents stored in digital format replacing physical ones." [translated]

Pn. ZY who is concerned about data security to protect sensitive and confidential information from unauthorised access, breaches, and cyberattacks, said:

> "The implementation of AI technology needs to come along with cybersecurity enhancement as the advancement in technology requires the data security to be strengthened to protect the data." [translated]

This view is further supported by Pn. NJ, who sees the importance of expertise in AI implementation to ensure the technology deployed delivers its intended benefits effectively. The expertise refers to IT professionals who can develop the systems to meet user needs in utilising AI-embedded systems efficiently and make informed decision-making:

> "One of the challenges in AI implementation is lack of expertise. We need the expertise to develop a system that can effectively integrate our AI requirements into accounting and tax activities. However, our expertise in this area is limited, hence we require assistance from vendors and have to rely entirely on their assistance and expertise. The vendors sometimes take advantage of our dependency on them. Apart from the expertise, the budget constraint is another challenge which might affect the timeline of system development." [translated]

This study reveals that some participants are facing compatibility issues with their hardware and software. The frequent replacement of hardware equipped with the latest technology is not compatible with the capability of the current system, hence requiring hardware downgrading. To support this statement, Pn. ZAH provided her insights on the compatibility of hardware and software that she currently experiences:

> "Another important consideration before implementing AI technology is to review the compatibility of the system with our requirements. The new AI-embedded system must be compatible with the specifications of our laptops and desktops. At the ministry, we frequently receive new laptops or desktops in every two or three years, equipped with the latest technology. If we have to use a system that requires downgrading, it may cause problem to us. We require any new system to be developed to always be compatible with our laptop and desktop technology. We don't want to downgrade our hardware because it will disrupt our operational activities. Therefore, we strongly suggest that new system to be developed need to be compatible with current and future technological advancements." [translated]

Another notable finding from this study is insufficient server capacity in current infrastructure that led to network disruptions. AI implementation requires substantial server capacity to process large data volumes quickly. Several participants experienced server-related problems which disrupts their daily activities and work processes. Pn. ZY noted that:

> "Some of us facing server-related problems that often cause slow data loading. The system becomes sluggish, especially during festive or month-end closing, which delaying our work up to for several hours. We are not clear on the actual reason whether this is due to a centralised server or other factors. For example, approving vouchers will take longer time when the server disrupted delaying our payment processing. To integrate AI into the system, sufficient server capacity is significant." [translated]

4.2.3 Lack of Clear Guidelines

The third sub-theme that has been discussed during the interview session is the lack of clear guidelines to implement AI in public sector accounting and service delivery. The participants were asked about the significant challenge in the implementation of AI in the public sector, and yet few participants argued amongst the weaknesses that need to be considered is lack of clear guidelines on AI implementation. Before implementation of AI technology, a clear guideline that outline a structured framework, code of ethics, line and responsibilities, and cybersecurity protocols need to be developed for all user level references. The framework should be tailored to the culture, regulations, the way of thinking, technology requirement, and very crucial in risk mitigation by offering approach to problem-solving. During the early development and implementation, the framework should be tested for its suitability and identify area of improvement. The absence of the framework leads negative impact, such as inconsistent practices by vast number of users, encourage data security breaches, user reluctance, exposure to risk of error and prevents the whole government machine from fully benefiting from AI potential. In response to the availability of existing frameworks in relation to AI technology implementation, Dr. SB argues that:

> "What are our current references for AI framework? So far, I haven't seen any available framework that we can use as a guideline. We cannot simply refer to countries that have developed AI frameworks for their own country because of the differences in culture, thinking, and various other contexts. This is important because we need to understand our own culture and assess the suitability in AI context. We need to adapt the use of the technology to meet our needs and cultural context, otherwise, it may impose us to negative impact." [translated]

Dr. SB provides further explanation:

> "We can't simply adopt technology without evaluating its suitability. The level of accountability also differs. As of now, what is the best framework available to assist in decision-making, particularly in the context of financial reporting and accounting, auditing, human resource management, records management, and financial management? AI can be applied in all these contexts to aid decision-making. However, the question remains: what is the best available framework to help us make better decisions? There are several frameworks available at global level so far, but I haven't seen one in Malaysia that fits our needs, and the possibilities of acceptance issues is likely to happen." [translated]

This response is further supported by Pn. AR, who emphasised that the guidelines set need to consider the core business processes of each ministry and government agency to ensure consistency and effective problem-solving across all departments:

> "Each department or ministry has different business activities and types of revenue generation. Sometimes, some issues cannot be resolved through central guidelines, requiring us to find solutions on our own. This highlights the lack of clear guidelines that should address the issues faced by each department. Therefore, at the central level, it is essential to have a comprehensive guideline that can help to resolve issues for each department while considering the different business activities of each ministry." [translated]

4.2.4 Resistance to Change

The next challenge in the context of AI technology implementation is the reluctance or refusal of individuals within the departments to adapt to new methods, technologies, or processes. The reasons can be few ranging from fear of facing unfamiliar technology, comfort with traditional routines, or concerns about job replacement by the technology itself. The attitude of reluctant to change might cause the adoption of new technology to progress slowly, under utilisation and defeat the purpose of the new technology. The participants were asked for their insights about the phenomenon in their department. Most of the participants are concerned about senior-

level staff who normally prefer traditional ways of doing tasks regardless of changes in current technology. This is explained by Pn. MM:

> "In government departments, we have various levels of staff, and many of them are seniors. Some of the senior staff are somewhat reluctant to adapt to the changes and learn how to use the latest technology on their own. They are not interested and have a fear of exploring and utilizing new technology and often revert to traditional methods. Typically, when involving staff in technological aspects, from my own experience as a leader, I prefer to deal with mature staff who are not reluctant to new changes." [translated]

Overcoming resistance requires two-way communication between the leaders and the staff, together with adequate training and motivation to ensure smooth transitions and acceptance amongst the users. The study findings, however, revealed that the key factor to change is the attitude amongst the staff themselves to embrace new systems. Cik ZY provided her explanations on this matter:

> "Not all senior level staffs are unwilling to learn. There are challenges to adapt changes, but for those who genuinely want to learn, we consider them excellent. Despite their senior age, they remain eager to learn. That's why I say this is also related to attitude. A change in attitude amongst the staff is important. However, if you ask my opinion as a leader regarding the reshuffle, I need to ensure my staff have the necessary skills if I want to see good progress. Meaning, I would assign skilled staffs to handle tasks related to AI. In other words, I wouldn't assign those who are reluctant to deal with the system." [translated]

This study also discovered that, despite assessing the readiness of lower-level staff, it is crucial to evaluate the leader or department heads to ensure they are fully prepared and have a clear understanding of the objective and steps for AI implementation. Lack of readiness and clarity at the leadership level will affect the readiness and acceptance of lower-level staff on the integration of advanced technology. As explained by Dr. SB:

> "A more appropriate question to ask the leaders or department heads would be, "Are you ready to adopt AI technology?" If they are ready, they should be able to explain the objective and steps that need to be taken for adoption of advanced technology. If they can't, it indicates that they are not ready and not fully understand what needs to be done." [translated]

4.2.5 Lack of a Defined Purpose for AI Adoption

The final challenge that emerged from the interview session was a lack of understanding regarding the objective of AI adoption. Implementation of AI must be guided by a clear objective and thorough understanding of technology current problems that may affect the implementation.

Several participants emphasised the importance of defining those problems before aligning technological capabilities to address them. Without a well-defined objective, AI implementation might cause a waste of resources - both time and money -, under utilisation of technology, misalignment of strategies with a current strategic roadmap, and failure to deliver measurable benefits to the departments. Dr. SB provided his opinion regarding this issue:

> "To make good decisions, we must have a thorough understanding of the current problems and related issues. We need to know what problems exactly we are trying to solve. It's not just about the technology itself, but more on the parameters we set. The issue isn't due to the limitations of technology, but rather how well we understand and utilise it effectively. The most important thing is proper monitoring on the framework planning for the department or governmental as a whole." [translated]

The statement above is further supported by Dr. MD, who opined that:

> "Each department or ministry must have a clear objective on why AI technology needs to be implemented. If there is no specific objective to be achieved through the use of AI, then there is no need to integrate AI into the current system or applications." [translated]

4.3 Perceived Opportunities

Another interview focus was the potential benefits or opportunities AI could bring to users from the implementations. The study identified several AI technology potentials, such as enhanced efficiency, improved decision-making, and routine task automation. These opportunities are categorised into several sub-themes including Efficiency Improvements, Enhanced Decision-making, Reallocation of Tasks, and Long-term Integration Plan. Exploring these opportunities is crucial for successful AI integration and realising its full potential.

4.3.1 Efficiency Improvements

The first potential opportunity discussed with the participants is the efficiency improvements that AI can bring to the process flow of the department. The implementation of AI technology allows certain tasks to be completed faster, with greater accuracy and fewer resources while improving quality. Amongst the feedback received from the participants is AI can eliminate redundant and repetitive tasks, reduce human error, speed up transaction processing, and optimise workflow by streamlining certain processes. The participants provided suggestions on specific areas of improvement where AI can assist in their daily tasks. This included revenue collection, payment processing, asset management, and financial reporting. As noted by Pn. MM about the revenue collection:

> "In terms of revenue collection from hospitals, the fixed payments from outpatients have a high potential to be automated with AI technology as it

involves repetitive tasks. These recurring processes do not require manual process and frequent human intervention." [translated]

She further added on repetitive process on staff claims:

"AI technology also can be embedded in claims processing which are repetitive in nature. For example, overtime claims for support staff and on-call claims by doctors. The same process is repeated monthly whereby the claimer need to fill in the same forms and fields each time they submit the claim. When any errors are identified, the correction process is difficult as it often requires physical inquiries to the claimer. If technology can prompt automatically the errors and any inquiries, the repetitive errors can be avoided to happen. With the existence of AI, the claim process can be simplified and reduce the needs of excessive manpower to process the claims." [translated]

The highly repetitive processes in public sector accounting make it ideal candidate for an application of robotic process automation (RPA) facelift. Besides, the RPA can reduce and automate manual processes, minimise error, and allow staff to focus on high-value activities by allowing the technology to take over the traditional method. The repetitive transactions such as fixed income recognition and staff claims can be expedited by integrating RPA into the system. The RPA robots in the public sector have been utilised in the unclaimed money transactions process. However, the current function of RPA is limited to a document checker where the system ensures all necessary documents are sufficient before the claims are submitted to the verifier for further process. This function can be further explored to handle processing vast amounts of unclaimed money transactions in the public sector. Pn. AR explained:

"The function of RPA in unclaimed money claim transactions can be extended to read the information in the documents such as identity card (IC) number and match the information in the system to expedite payment processing. For unclaimed money submission, if the documents such as the aging report can be uploaded before inspection, AI can assist in identifying any potential unclaimed money upfront based on the aging report submitted. This allows us to focus on those cases during the inspection without having to review ledgers one by one. This improvement in RPA can save time and increase efficiency. We are not required to reduce the staff but to increase the key performance indicators and number of companies to be inspected. Currently, we have lost a lot of time waiting for the companies to submit the information manually. With the existence of AI technology, the submissions can be done online, automatically processed and AI will perform a review to all ledgers, eliminating the need for manual check-in identifying potential unclaimed money transactions." [translated]

Another area of improvement identified in this study is using the RPA in automating payment processing. The implementation of optical character recognition (OCR), as part of RPA

technology, allows the system to automatically capture the text from digital files, hence reducing manual entry and automating payment processing. A certain part of the process still requires human intervention, but the efficiency could be enhanced with technology. Pn. AR commented:

> "AI can take over the human task in verifying vouchers. The technology allows AI to match vouchers with supporting documents without the need for manual processes. The system might be able to capture payment information from scanned documents, ensuring that the information and costs stated in the vouchers are accurately captured, and subsequently allow for payment process. With AI, these processes can be expedited. However, the government sector remains complex and not everything can be resolved easily with technology. Some transactions will still require human judgment and discussion. Nonetheless, AI has the potential to enhance our services." [translated]

Besides payment processing, Cik ZY expressed her concern on the preparation of bank confirmation statement which still being prepared manually:

> "Moving forward, the process of preparing bank confirmation statement, currently prepared manually, need to be automated in the system with the help of technology to simplify and ease our work. All the required data is already available in the system. We only need to input the data in the system, or perhaps, in the future, the technology able to capture the data through document scanning directly." [translated]

Another area that requires attention is asset management in view of the vast number of assets that government departments and state authorities own. Pn. AR further explained:

> "I can see a significant opportunity for AI to be implemented in the asset management process because the government and state have a vast number of assets, either still in existence or not, and we cannot manage them all comprehensively. We are currently inspecting fixed assets such as land and development. If we had AI technology, it would be beneficial to identify potential asset maintenance. For example, if we find that an asset is worn out or requires maintenance, AI could prompt or provide early warnings, making the process more structured and efficient." [translated]

During the interview, participants highlighted their concern about the role of AI in financial reporting. Currently, financial reporting and analysis are manually prepared which is time-consuming. They suggested that AI should assist in analysing the data by identifying patterns, trends and providing real-time information to the stakeholders to support informed decision-making. The system should enable the generation of financial reports together with the notes to the account, directly from the system rather than manual preparation by the accountant. Pn. ZAH responded to this issue:

> "One of the common issues currently faced by the accountant is the preparation of financial reporting which is still being prepared manually using Excel. At this point, we should already have all the necessary data generated from the system to generate financial reporting, and this process should ideally be automated. If we generate reports using AI, we could create dashboards to display real-time status, for example, cash flow balances. Another example is in investments, where we can access information, such as predictions, trends, and others offered by AI functions to assist decision-making." [translated]

4.3.2 Enhanced Decision-Making

AI not only have capability to assists in automating repetitive tasks, process large volumes of transactions quickly, and reduce manual works, but the technology also support accuracy and informed decision-making. Any decision based on facts and figures is essential to improve outcomes, reduce risk, and increase the overall effectiveness of public sector operational process flow. The study identified that AI is not capable in making ultimate decisions due to lack of empathy and professional judgement to decide on complex decisions, hence human judgement is still necessary in making any decisions. Participants agreed that AI can only provide suggestions and data required to assist in decision making but the final decision requires professional judgment by human. Pn. RI provided her opinions on this statement:

> "From my opinion, when the AI technology is integrated with current system, some steps in the process cycle can be reduced. I still believe that human involvement is still necessary despite of steps reduction. For example, in the procurement process, we have certain procedures to be followed. Technology can assist and perform certain functions such as verifying the information. However, any decisions on procurement which require judgement and critical thinking, human involvement is still crucial. AI can perform task as simple as document verification but the task involving professional judgement and critical thinking still requires human involvement." [translated]

This is further supported by Dr. MD:

> "In government sector, it is impossible to have 100% utilisation of AI in practices. AI might be able to make suggestions in the decision-making process based on the available data, but the final decision still must be made by humans." [translated]

4.3.3 Reallocation of Tasks

AI implementations automate certain process which was traditionally performed by humans leading to job displacement and redundancies. The capability of technology to handle repetitive tasks and large volumes of transactions creates opportunities to reallocate human capital in improving overall process effectiveness, reduce errors, and better utilisation of human talent

by focusing on understaffed or more strategic areas. While these opportunities benefit both staff and departments, participants think that it might create fears amongst the staff that their positions become obsolete due to automation. Cik ZY commented on this matter:

> "In my opinion, the emergence of technology will not reduce the number of accounting staff, but effort must be made to upgrade the skills that they currently have. Technological advancement requires new skills to be developed and upgraded to adapt changes. Historically, when we talked about AI, people expressed their fear that accountants would no longer be needed. However, I don't believe that will happen because the accounting profession still requires professionalism from the accountants themselves, especially in decision-making aspects where AI lacks humanity. AI may be advanced, but in the field of accounting, human resources requirements need to be enhanced with decision-making skills and the directions of future accountants need to be in that direction." [translated]

Pn. MM further added her concern about staff reallocation upon job automation by AI:

> "The use of AI will reduce some of the daily tasks. Staff whose positions are taken over by AI technology can be reassigned to other areas. We haven't fully addressed many different functions, such as audits and asset management, which require extensive attention. By reducing certain responsibilities, we can focus more on clients or other understaffed areas." [translated]

4.3.4 Long-Term Integration Plans

The interview also focussed on future expectations of public sector servant for the integration of AI technology into the current system. The integration plans should be incorporated into the framework to ensure alignment with the established strategic road map, meet objective and future requirements, and benefit both departments, and government at its maximum. The study revealed that a long-term integration plan should consider factors, such as the latest Malaysian AI roadmap, implementation objective, infrastructure upgrades, cybersecurity concerns, and efforts for continuous improvement in ensuring that AI adoption remains sustainable and delivers maximum benefit to the users. Pn. NA expressed her hope:

> "We act as agents for AI as we have a large amount of data, including both financial and non-financial data. However, we still have to perform manual processes to collect, process, and analyse these data. We hope that AI can assist in simplifying this traditional method of doing things. Currently, the management not only evaluates financial data but also considers non-financial data in making decisions as effective decisions require both types of information. The scope of AI implementation is not only for the accounting field but for the whole government machine. Hence, it is crucial to consider how

> AI can be applied in all areas, as we need to keep up with the rapid pace of technological advancement." [translated]

While integrating the operating system with iGFMAS as a single, comprehensive hub is seen as important, the complexity of this integration is a challenging task. Pn. AA opined that:

> "The issue of integrating operational systems with iGFMAS is frequently raised. However, it is important to understand that the iGFMAS policy itself does not allow the iGFMAS system to be integrated with multiple different systems. Some agencies or ministries have many subsidiary systems depending on each type of revenue and are governed by different legislations. We are currently working on developing a unified system that enables us to connect with AG through a single, comprehensive hub and this is a very large and complex effort to be undertaken." [translated]

The study also discovered that the compatibility of legacy operational systems needs to be considered before integrating with AI-embedded systems to ensure smooth integration and readability of data. This is mutually agreed upon by several respondents. Pn. MM explained about this issue:

> "The current operating system used by some departments is outdated and requires significant improvements, as it often creates problems for the users. Therefore, before the integration with the iGFMAS system, we need to consider the area for improvements or upgrading those operating systems to make it compatible and overcome the problems related to readability and accessibility." [translated]

Based on the responses gathered from the respondents in this study, it can be concluded that while there is general awareness of the concept of AI and the potential benefits AI can bring in public sector accounting, significant challenges remain and require attention to be mitigated.

5.0 Conclusion

The purpose of this study is to understand the complexities and opportunities surrounding AI integration within the context of Malaysian public sector accounting. Using a qualitative approach, the study involved semi-structured interviews with Malaysian public sector accountants to explore their awareness, readiness, and attitudes towards the integration of AI-embedded technology into the current accounting and operational system.

The key findings are presented under three (3) themes: AI Awareness, Perceived Opportunities, and Perceived Challenges. These themes are divided into ten sub-themes which emphasise potential benefits of AI implementation and the potential challenges that could arise from the technological changes. The potential benefits identified are improvement in decision-making, enhancement in process efficiency and opportunities to relocate staff to other areas of concern.

Amongst the challenges identified are a lack of integration between the operational and accounting systems currently used, reluctance to change amongst senior-level staff, insufficient server capacity, budget constraints, and the non-existence of a tailored local framework to the Malaysia environment. While the potential benefits added value, the challenges need to be mitigated by understanding the objective of AI implementation, provide adequate training to all staff levels, and develop frameworks that are suitable for local culture, ways of thinking, and regulatory requirements to ensure the implementation of AI benefits at its full potential.

As with many other systems or technological advancements, the adoption of AI is not without the challenges. The most important thing to consider before the initiatives take place is to investigate the current technology gap in public sector accounting for each department or ministry which might hinder the implementation of AI in the public sector. Amongst the gap discovered is this study is the lack of integration between multiple different system, including the accounting systems used in the public sector. Many departments rely on standalone systems for operational purposes, which are not integrated with the accounting system leading to redundant tasks, repetitive errors, relying on traditional methods and manual processes, and difficulties in handling large volumes of transactions. Furthermore, the solutions for other challenges, such as limited server capacity, unclear policy for cybersecurity, budget constraints and compatibility issues between the system and the hardware need to be addressed before implementation takes place to unlock the full potential of AI and improve overall efficiency and accuracy in public accounting and service delivery processes.

Another concern on potential challenges is the readiness of public sector staff to accept changes. While most senior staff are reluctant to learn new methods and technologies, some of them are eager to learn despite their seniority. Hence, adequate training and motivation are required to inspire the staff to change their attitude and move from traditional methods towards technological advancement. The leaders or heads of departments are responsible for the change, whereby they need to be ready and understand their roles in the implementation. Besides, sufficient training needs to be provided to all staff levels in handling AI-embedded systems. The study also emphasised the importance of assigning skilled staff to manage AI-related systems, as reluctance may hinder the system from operating at its full potential. Besides, the study highlights on the non-existence of AI frameworks tailored to the Malaysian context. While numerous frameworks exist in other emerging countries, they cannot be adapted to the Malaysian environment due to differences in culture, ways of thinking, and legal requirements. Thus, a tailored AI framework that is suitable for local practices should be developed. Without such a framework and clear guidelines, the implementation of AI may impose a negative impact to the users with a potential risk of failure.

The implementation of AI provides potential opportunities in public sector in terms of decision-making, job efficiency, and staff relocations. The availability vast amount of information and various data in AI-embedded systems is crucial to provide choices and suggestions in assisting decision-makers to make informed decision making. Moreover, AI-embedded systems can automate repetitive tasks, such as collection of revenue and staff claims, reduce steps in certain processes, and prompt any reminder, in daily processes. AI technology should enable the

preparation of financial reports automatically to overcome current practices of being prepared manually. The ability to analyse and create dashboards for real-time data enhances information dissemination to the users of financial statements and decision-makers. The automation saves time, reduces potential human error, and allows accountants to focus on data analysis and decision-making rather than spending time on manual processes. In addition, the replacement of certain tasks by robotics or AI technology provides opportunities for staff relocation to understaffing or other areas that require attention. The integration of AI offers transformative opportunities and requires careful planning to ensure its successful adoption in the Malaysian environment.

There are several limitations identified in this study. First, the small sample size of 18 participants limits the representatives and findings across all Malaysian government departments. Future qualitative study should expand the samples into bigger size for more views and extensive finding. Second, the scope of the study focused on participants in Malaysian public sector accounting only and not apply to other emerging countries with different cultural, regulation and environment. Future studies should consider investigating AI implementation in other emerging countries to identify best practices and challenges faced. Finally, this study assesses participants' awareness and readiness rather than investigating the actual experience on AI implementation. Future study should focus into the actual challenges and benefits of AI implementation in government practice.

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Exploring Professional Competency Criteria for Succession Planning Framework for Public Sector Accountants in Malaysia: A Proposal

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Abstract

Purpose: This paper explores the development of professional competency criteria for succession planning for accountants in the public sector, aimed at identifying competent accountants in the public sector.

Design/ Methodology/ Approach: This study employed a quantitative and a qualitative approach, specifically utilising interviews and content analysis as the data collection method.

Findings: This paper proposes that the professional competency framework can be developed by integrating the competency framework proposed by International Federation of Accountants (IFAC) and Malaysian Institute of Accountants (MIA) with the competency framework in the business and education sectors. The framework consists of technical and non-technical competence skills. Subsequently, technical competencies are further divided into functional and generic skills. Non-technical competencies include intellectual, interpersonal, and communication skills; personal and organisational skills; professional scepticism and judgement; ethical principles;and a commitment to the public interest. Within this non-technical competence, further subcomponents are defined and included in the proposed framework.

This article is part of a research on Developing a Succession Planning Framework for Public Sector Accountants' Talent Management Using Behavioral Event Interview Approach supported by the Accountant General's Department of Malaysia through *Geran Penyelidikan Perakaunan dan Kewangan Sektor Awam Tahun 2024* (JANM.600-21/1/7 (3)).

Research Limitations/ Implications: The implications of this study highlight the need to identify the professional competency criteria for a succession planning framework for accountants in the public sector to sustain a culture of excellence in the organisation.

Practical Implications: The implications of this study's results suggest the potential for developing a professional competency criteria for succession planning framework for public sector accountants in Malaysia.

Originality/ Value: This study is the first attempt towards developing a professional competency criteria for succession planning framework for public sector accountants in Malaysia.

Keywords: Succession planning, professional competency, accountants, public sector, Malaysia

1.0 Introduction

In the past, organisations have sought to replace key employees immediately after they left their companies. Often, these organisations face the challenge of finding suitable candidates to replace departing employees. Over time, however, companies have realised that they can find future managers and leaders within their own organisations. They are also realising that with tools such as succession planning, they can be sure that they will be able to meet the demands of the future. Succession planning is an important aspect of human resource management (Escano & Limos-Galay, 2023). In the past, succession planning has primarily focussed on individuals rather than the specific skills and expertise required for the future of the organisation (Garman & Tyler, 2004). During this time, the main objective of succession planning was to identify the necessary successors to succeed their predecessors in a particular role. From this traditional perspective, succession planning focusses on senior executives and business owners within the larger organisation (Kniskern & Williams, 2005). Traditionally, succession planning has been associated with the process of identifying and preparing individuals to take over key positions in organisations (Charan et al., 2001).

Succession planning is a strategic approach to risk management (Rothwell, 2005) that involves identifying and preparing individuals to take over key leadership positions when they leave the organisation (Burdett, 1993). During this period, companies often try to find replacements for key employees who have left the organisation. As a result, companies had difficulty finding suitable candidates to replace those who left. Nevertheless, companies have gradually come to the realisation that they can identify their future managers and leaders within their own organisations (Mehrabani & Mohamad, 2011). They have also realised that using strategic tools, such as succession planning, enables them to meet future challenges with confidence. In the current dynamic landscape, characterised by intense rivalry, flexible working arrangements, unexpected environmental factors, flat organisational structures, and frequent changes in organisational configuration, the traditional approach to succession planning, where specific individuals are assigned specific roles, is no longer practical. Organisations need a cohort of highly talented individuals at every level of the hierarchy (Mamprin, 2002).

Jabatan Akauntan Negara Malaysia (JANM) is currently looking for a sustainable mechanism to develop a comprehensive talent management profiling database in order to effectively manage the recruitment and development of competent personnel to support the implementation of its succession strategy. This underscores the necessity for JANM to enhance its succession planning and talent management procedures to align with sector norms in Malaysia and the standards of comparable organisations abroad. Enhancing the strategy for enhancing necessary skills and abilities is imperative to ensure the successful implementation of JANM's succession planning and talent management in the future. This is to guarantee that JANM's services are provided by highly competent professionals, thereby enabling the realisation of JANM's vision and mission. Furthermore, talent management has not yet been integrated into JANM's profiling. This may have a negative effect on JANM's objective-to develop future accountants who comply with the standards established by international organisations and sector norms in Malaysia. To develop the most effective succession planning framework, a professional competency framework should be embedded in it. However, to date, there is yet a professional competency framework for public sector accountants.

This study aims to explore the development of a professional competency framework for accountants in the public sector. Specifically, this study aims to identify the competency skills required by public sector accountants in performing their tasks and, subsequently, proposes a professional competency framework for public sector accountants in JANM. This is important to ensure the future implementation of JANM's talent management and succession planning. The findings of this study help JANM understand how to identify the best talent that delivers services effectively in line with JANM's vision and mission. The remainder of this article is organised as follows: Section 2 reviews the relevant literature for this study. Section 3 presents the research design, followed by Section 4, which presents the findings. The last section, Section 5, concludes this study.

2.0 Literature Review

The backbone of any organisation, regardless of its industry, is its employees, who play a crucial role in creating value for the organisation. Succession planning is a strategic process that aims to identify both the short-term and long-term needs of employees, identify the gaps between what exists and what is needed, and then implement solutions (Bano et al., 2022). Succession planning focusses on ongoing talent management activities designed to ensure that an organisation has a skilled, high-performing workforce capable of meeting business objectives. As the business environment evolves, organisations need to adapt their HR strategies and move from a traditional people management approach to a strategic HR approach (Armstrong & Taylor, 2023; Boselie & van der Heijden, 2024). One of these strategic human resource activities is succession planning. According to Al-Tamimi et al. (2017, p. 10), succession planning is:

> *Succession planning is the ongoing process of identifying, assessing, and developing skills and talent through mentoring, grooming, training, and job rotation. Succession planning is a voyage, not an end by itself. Succession planning is the course of action ensuring that the appropriate individuals are ready, at the right time, to effectively run the organisation and meet its future challenges.*

Succession planning is a means of identifying critical positions and potential candidates to fill them. The term also encompasses a methodical procedure that clarifies how an organisation maintains smooth management continuity and safeguards its future by guaranteeing the availability of qualified individuals when required (Siambi, 2022). Succession planning is a proactive, systematic process by which an institution ensures its members develop the skills, knowledge, and abilities to help or prepare them to pass through the institution (Ghazali et al., 2022; Siambi, 2022). Initiating a succession plan requires formulating a strategic approach and setting clear goals. However, many organisations struggle during this initial phase and include familiar or convenient names in their succession plan instead of approaching the process strategically (Geib & Boenigk, 2022; Joshi, Hambrick, & Kang, 2021; Campopiano et al., 2020).

Succession planning is an important framework that considers an organisation's resources to secure and develop employees with high potential (Johnson et al., 1994; Escano & Limos-Galay, 2023). Succession planning is a methodological approach that helps managers identify a group of high-potential individuals, improve their leadership skills, and ultimately select leaders from this pool of potential candidates. Mamprin (2002) characterises it as a methodical and purposeful practice aimed at ensuring an organisation's future ability to fill vacancies without favouritism or family connections. One of the main reasons for conducting succession planning, especially for key leaders, is to ensure the uninterrupted operation of the organisation (Beagrie, 2005). Another reason for conducting succession planning is to develop a comprehensive strategy for recruiting, developing, motivating, and retaining employees. Succession planning goes beyond finding potential replacements or filling gaps left by departing employees (Marshall, 2005). It is also crucial to establish a link between the skills and capabilities of future leaders and the strategic goals of the organisation. Furthermore, integrating succession planning with change management shows that the company is actively preparing the most suitable person for a particular role, taking into account the organisational culture (Aldape, 2005).

For decades, succession planning has mostly focussed on identifying individuals rather than assessing the skills and aptitudes required for the organisation’s future (Garman & Tyler, 2004). During this period, the main objective of succession planning was to identify suitable successors who could replace their predecessors in a particular role. According to Williams (2005), succession planning focussed primarily on top management and business owners in large organisations. Rothwell (2005) opined that succession planning is a strategic approach to risk management that involves identifying and preparing individuals to assume key leadership positions in an organisation before current leaders depart (Charan et al., 2005). Succession planning has traditionally focussed on identifying specific individuals to assume leadership roles, such as high-level executives and business owners in large corporations (Kniskern & Williams, 2005). Although succession planning is not new, many organisations, such as CEOs, limit it to top-level appointments. Organisational structure can influence the process, regardless of the actual need for vacancies (Coulson & Thomas, 2013). However, organisations at various levels need individuals with outstanding potential in today’s world. The world is dynamic and rapidly changing; competition is intense, work is adaptable, the environment is unpredictable, organisations have a flatter structure, and their configuration is constantly changing (Al-Tamimi et al., 2017). As a result, the traditional approach to succession planning, which centres on the selection of specific individuals, is no longer effective.

Contemporary organisations need to build a group of people with great potential as future candidates at every level to be prepared for any demands that may arise at any given time.

Mamprin (2002) argues that rather than focussing on cultivating skills for specific roles, it is more logical to foster broad-based skills that promote adaptability and leadership potential at all levels of an organisation, emphasising the need to involve all employees in the succession planning process. In modern organisations, adopting tactics to foster versatile skills, promote flexibility, and enhance leadership capabilities at all levels is a strategic choice (Mehrabani & Mohamad, 2011). Furthermore, companies have recognised the opportunity to identify future managers and leaders within their own organisations. This is in line with studies that indicate that organisations can efficiently meet their future needs by using tactics such as succession planning (Byham et al., 2001). Despite the apparent importance of succession planning for private for-profit organisations, it is common for government and non-profit organisations to operate without such preparation. Furthermore, the literature review indicates a lack of meaningful research on succession planning in governmental organisations (Al-Tamimi et al., 2017). In particular, there is a lack of information on succession planning in government organisations such as JANM.

McClelland (1973) introduced the Behavioural Event Interview (BEI) approach, an instrument for assessing the leadership competence of managers. Harvard University psychologist McClelland developed the needs theory and the issue perception test. This instrument is a method based on Flanagan's Critical Incident Technique (Flanagan, 1954). McClelland developed the BEI approach as a means of assessing the leadership qualities of managers. This method is based on Flanagan's Critical Incident Technique. The Critical Incident Technique focusses on a specific event or incident, while the BEI approach focuses on the person responsible for it (Spencer & Spencer, 1993). The BEI instrument's primary goal is to collect very accurate descriptions of the behaviours associated with a person's work performance (Abdullah et al., 2024). The interviewer's primary goal is to extract comprehensive accounts from the interviewee, including their exact behaviours, thoughts, and actions in real-life situations. This instrument necessitates the creation of a sequence of behaviours that include a participant as an integral part of the testing process. During the interview, the video is carefully scrutinised to find evidence that the person has the required skills and attributes. Recording the interview, preparing transcripts, and analysing these transcripts can take up to six (6) hours for each interview. Behaviour documentation is an essential and central aspect of the BEI interview. As a rule, the interviewee must describe in detail the five or six most important situations they have experienced in a particular position. The scenarios should include at least two or three notable successes and two or three notable obstacles (Mohamed Jais et al., 2023). The BEI approach is believed to help develop a succession planning framework for JANM talent management. However, to apply the BEI approach, JANM must establish professional competency criteria to determine an applicant's required skills for account positions at JANM.

Professional competence refers to the ability to perform a role to a defined standard, which is defined as a specific set of expectations set by a professional body (MIA, 2020). It refers to the combination of knowledge, skills, abilities, and behaviours that enable an individual to perform their job or profession effectively and according to the required standard. This includes mastery of specific technical or domain-related tasks while demonstrating strong interpersonal and ethical behaviour (Epstein & Hundert, 2002). In addition, Slezak (2024) state that "soft skills are essential for accountants to fulfil their moral broker role in society." According to Epstein and Hundert (2002), competence is evolving; it develops over time through experience, practice, and continuous learning. In their influential essay, they describe competence not as a fixed attribute but as something that can grow and improve over the course of a career. In

essence, Epstein and Hundert emphasise that competence is not static but evolves through an individual's lifelong learning, practice, and self-improvement along their career path. According to Epstein and Hundert (2002, p. 226), professional competence involves the following:

> *The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served.*

There are also studies in the field of accounting that attempt to determine the components of professional competency that an accountant requires to become competent (Palmer et al., 2004; Sarapaivanich et al., 2019; Rufinoet al., 2022). These studies recognise that accounting, like other professions, requires a mix of technical knowledge and broader skills for effective practice. In addition, these studies have identified key competencies for accountants, which generally fall into two broad categories: technical and non-technical skills. Regarding technical skills, they viewed knowledge of accounting and finance as crucial to their work. However, they rarely or never used general knowledge and information technology at work (Rufino et al., 2022). Professional accountants, on the other hand, almost always use non-technical skills related to intellectual, interpersonal, and communication. Professional accountants emphasised teamwork, analytical thinking, and written and oral communication. Similarly, providing accounting services to clients almost always involves observing and practising professional values, ethics, and morals (Palmer et al., 2004). However, these studies mostly focussed on accountants in general, leaving the examination of professional competency of accountants in the public sector largely unexplored.

Professional organisations, such as the IFAC, define professional competency as the ability to perform a task to a certain standard. Competence goes beyond knowledge and encompasses technical and non-technical (transversal) competences, including professional values, ethics, and attitudes. Technical competencies include areas or domains, such as financial accounting and reporting, audit and assurance, management accounting, finance and financial management, strategy and governance, tax, and corporate laws and regulations (MIA, 2020). Non-technical competencies, on the other hand, refer to competency areas or domains such as communication, team and leadership, problem-solving, integrative approach, professional scepticism and judgement, ethics, and trust. On the other hand, from a leadership perspective, studies have highlighted the skills a leader must possess to achieve superior performance, which, if recognised, can produce better generations of leaders (Smith & Wolverton, 2010; Mohamad & Abdullah, 2017). Example: Mohamed Jais et al. 2021. reported on the process of creating a leadership competency framework for universities in Malaysia and identifying qualified leaders for their institutions. They found that the framework should consider the following five clusters: personal effectiveness, cognition, leadership, impact and influence, and performance and action. However, there is yet a professional competency framework that specifically caters to public sector accountants.

According to Kane (1992), assessing professional competency is difficult and, in many ways, very frustrating because professional practice is a complex and intellectually demanding activity. As a result, it is difficult to describe or assess accurately. It is well known that experts disagree on how to handle certain situations in professional practice, making it difficult to assess a potential candidate’s performance in them. However, Kane (1992) argued that the assessment of professional competence can be straightforward, assuming that individuals have a general idea

of what competence means in different areas. This can be achieved by clarifying the difficulties in assessing professional competence and perhaps suggesting ways to minimise the impact of these difficulties. Professional accounting organisations such as IFAC and the American Institute of Certified Public Accountants (AICPA) have attempted to develop a competency framework that encompasses core areas such as professional knowledge, personal skills, and leadership. In addition, accounting education researchers often focus on the importance of developing not only technical accounting skills but also critical thinking, communication, and ethical reasoning to respond to the changing nature of the profession (Hunter et al., 2023). These studies consistently emphasise the need for the holistic development of accountants who balance technical knowledge with interpersonal and strategic business skills to succeed in an increasingly complex and global financial environment.

3.0 Research Methodology

3.1 The Participants

This study examines professional competence criteria to determine what skills a candidate must have for an accounting position at JANM. This study compares and contrasts three (3) dimensions: country, corporate, and education, after reviewing the literature. The seven (7) countries selected are the USA, Uganda, Australia, Canada, New Zealand, Singapore, and Malaysia. The selection of these dimensions allows this study to understand the criteria for professional competence used in determining an accountant's competence. The researchers selected these seven (7) countries because they believe they can accurately represent the population for this study and have frequently served as references in previous studies.

Additionally, this study included interviews with representatives from business organisations and education sector. The researchers contacted the participants by telephone to ask them to participate in this study. The first representative is a senior deputy director in charge of the accounting and management development department. The purpose of interviewing this representative is to gain an understanding of the strategic positions and their remit in the public sector. The second representative comes from the corporate organisation of Malaysia's largest financial services group, which provides a wide range of banking products and services, such as retail and corporate banking, insurance, investment, and wealth management. The company has a strong presence in Southeast Asia, with offices in countries such as Singapore, Indonesia, and the Philippines. The representative is the organisation's human resource director. The third representative is a deputy director of the Leadership Profiling Centre, a centre that was established by the Malaysian Ministry of Higher Education (MoHE). Its main task is to develop leadership and management skills in higher education, especially in public universities and colleges. JANM selected three interviewees from professional organisations and education sector to compare competency frameworks.

3.2 Research Instrument and Data Collection

This study uses the mixed-method approach to achieve its objectives. The mixed method approach combines both quantitative and qualitative methods, allowing a more comprehensive, balanced, and insightful understanding of the research problem. This study begins with a quantitative method by analysing articles and working papers about the professional skills of accounting organisations in various countries, based on the document review shown in Table

1. Seven (7) countries were selected: the USA, Uganda, Australia, Canada, New Zealand, Singapore, and Malaysia. The selection of these dimensions allows this study to understand the criteria for professional competency used in determining the competency of an accountant. The researchers selected these seven (7) countries because they believe they can accurately represent the population for this study and have often served as a reference in previous studies.

This study compiled a list of all the available articles on competency frameworks from the research literature using various database search programmes, including Google Scholar, EBSCOHOST, and the websites of relevant institutions. Additionally, the Career Development and Competency Department, Accounting and Management Development Division of JANM provided documents on the accountants' strategic positions for this study.

This study conducted a descriptive analysis of professional competency criteria developed by professional organisations such as IFAC and MIA, the corporate sector, and the education sector. The quantitative data was analysed using the Statistical Package for Social Sciences (SPSS). These professional competency criteria were analysed and compared to create the proposed professional competency framework for JANM.

Table 1: Sources from Public Document Review

Countries or Professional Associations	Content Analysis	Source
USA	International Education Standards	IFAC (2021)
Australia	International Accreditation Guidelines	CPA Australia (2024)
Canada	The Chartered Professional Accountant Competency Map	CPA Canada (2022)
New Zealand	Chartered Accountant Capability Model	CAANZ (2023)
Singapore	ACRA Skills Framework for Accountancy	ACRA (2023)
Uganda	CPA Uganda Competency framework	ICPAU (2022)
Malaysia	MIA Competency Framework	MIA (2022)
AICPA	Core Competency Framework	AICPA (2018)
CGMA	CGMA Competency Framework	CGMA (2019)
World Bank	Competency Frameworks for Professional Accountants and Auditors	Centre for Financial Reporting Reform (2018)
ICAEW	Professional Development Ladders	ICAEW (2023)
Institute of Management Accountants	IMA Management Accounting Competency Framework	Institute of Management Accountants (2019)
Higher Education Leadership Academy	Leadership Competency Framework	Mohamed Jais, Yahya., & Ghani, (2020)

This study employs a qualitative approach through semi-structured interviews, pursuing a problem-based approach that facilitates a more personalised discussion of professional competencies (Mayring, 2010). The purpose of this approach is to help researchers understand

the framework of occupational competence from the perspective of organisations and training. This study interviewed three (3) public, business, and education respondents (see Table 2). Consequently, this study collected participants' subjective views and information on the research topic. The interviews lasted approximately one (1) to two (2) hours.

The interviews were recorded and then transcribed. After transcription, the text was structured and categorised according to its main themes, followed by specific coding. The coding process was based on the identified professional competency criteria of an accountant in the public sector. The coding process resulted in a category system used to structure and guide the data analysis process. The responses in Bahasa Malaysia were translated and quoted verbatim for this study.

Table 2: Participants for Interview Session

No.	Sector	Position	ID Respondent	Date of Interview	Time
1.	Public Sector	Chief Assistant Senior Director	Ms. C	13 September 2024	2.15 hours
2.	Corporate Sector	Human Resource Director	Dr. I	16 September 2024	2 hours
3.	Education Sector	Assistant Director	Mr. A	12 October 2024	1.5 hours

According to the transcription, the researchers identified the occupational competency frameworks of these two (2) industries. The researchers then compared the findings from the semi-structured interviews with the context analysis to create a professional competency framework for JANM.

4.0 Findings

The main objective of this study is to identify a set of criteria for the professional competence of an accountant. In this study, the researchers analysed the articles and working papers on professional competence to determine their applicability. We then created a checklist to identify the criteria for professional competence as stated in the literature and specifically by professional bodies in various countries, including the United States, Uganda, Australia, Canada, New Zealand, Singapore, and Malaysia. Table 1 contains the content analysis criteria for professional competence. Table 1 reveals that Malaysia adheres to the same professional competence criteria as the USA. The professional body in the US is the IFAC. IFAC is a global organisation that represents the accounting profession and aims to strengthen and improve the quality of financial management and reporting worldwide. Founded in 1977, IFAC consists of more than 180 member organisations and represents over 3 million accountants in 135 countries. This adoption is due to the agreement between the Government of Malaysia and IFAC on 12 February 2013.

A comparative analysis was carried out to determine the similarities in characteristics between professional organisations in seven (7) countries. The results of the analysis, presented in Table 1, show that all these professional organisations have divided their professional competence criteria into two (2) main components, namely technical skills and non-technical skills. The USA, Uganda, and Malaysia categorise their technical skills at three levels: basic, intermediate, and advanced.

IFAC specifies the competence level of an accountant within the framework of the International Education Standards (2021). The basic level shows the basic knowledge and skills of an accountant in accounting, which correspond to the basic level of the International Education Standards:

i. Define, explain, summarise, and interpret the underlying principles and theories of relevant areas of technical competence to complete tasks while working under appropriate supervision.
ii. Perform assigned tasks by using the appropriate professional skills.
iii. Recognise the importance of professional values, ethics, and attitudes when performing assigned tasks.
iv. Solve simple problems and refer complex tasks to supervisors or those with specialised expertise.
v. Provide information and explain ideas in a clear manner, using oral and written communications.
vi. Work in an environment that is characterised by low levels of ambiguity, complexity, and uncertainty.

Intermediate level refers to the accountant having an intermediate level of knowledge and skills in accounting, which corresponds to the intermediate level of international educational standards. At the intermediate level, an accountant can perform the following tasks:

i. Independently apply, compare, and analyse underlying principles and theories in relevant areas of technical competence to complete work assignments and make decisions.
ii. Combine technical competence and professional skills to complete work assignments.
iii. Apply professional values, ethics, and attitudes to work assignments.
iv. Present information and explain ideas in a clear manner, using oral and written communications, to accounting and non-accounting stakeholders.
v. Work in an environment that is characterised by moderate levels of ambiguity, complexity, and uncertainty.

At the advanced level, an accountant has in-depth knowledge and skills in accounting that correspond to the advanced level of the international education standards. At this level, an accountant can perform the following tasks:

i. Select and integrate principles and theories from different areas of technical competence to manage and lead projects and work assignments and to make recommendations appropriate to stakeholder needs.
ii. Integrate technical competence and professional skills to manage and lead projects and assignments.
iii. Make judgements on appropriate courses of action based on professional values, ethics, and attitudes.
iv. Assess, research, and resolve complex problems with limited supervision.
v. Anticipate, consult appropriately, and develop solutions to complex problems and issues.

vi. Consistently present and explain relevant information in a persuasive manner to a wide range of stakeholders.
vii. Work in an environment that is characterised by high levels of ambiguity, complexity, and uncertainty.

On the other hand, Australia, New Zealand, and Singapore, although they do not make a statement on the competence criteria, have provided for an assessment of the professional competence criteria based on accounting. For example, the professional body in Singapore has identified five (5) areas to assess an accountant's competence. The five areas are financial reporting, assurance, decision support and analysis, governance and risk, and tax. The professional body in Canada, on the other hand, categorises technical skills into six (6) areas. The areas are financial reporting, strategy and governance, management accounting, audit and assurance, finance, and tax. In Malaysia, the areas of financial accounting and reporting, management accounting, finance and financial management, audit and assurance, governance, risk management and internal control, business and organisational environment, economics, corporate strategy and management, information and communication technologies, tax, and corporate laws and regulations are more comprehensive.

The results also show that professional organisations in Canada have divided their occupational competency criteria for technical skills into three (3) levels, namely Level A, Level B, and Level C. Level A is associated with a high level of complexity that involves considerable difficulty, as a large number of contexts and ambiguities must be considered simultaneously; innovative approaches are often required. Level B involves moderate difficulty associated with a number of contexts or variables that need to be considered simultaneously; circumstances may be less clear and require approaches that are not frequently practised. Level C, on the other hand, is associated with a low level of difficulty due to a small number of simple and frequently occurring problems; competence can be achieved through a "rote" approach. The number and types of contexts and ambiguities that require simultaneous consideration determine the difficulty level. The more complex and non-routine a situation, the more candidates must draw on their basic competencies to understand it. The expected levels of competence are set to reflect the nature of the situation. Coping with a more complex or non-routine situation usually requires high competence.

As far as non-technical skills are concerned, the analysis results show that most professional organisations in the seven (7) countries have similar requirements for them. There are seven (7) non-technical skills: intellectual skills, interpersonal and communication skills, personal skills, organisational skills, professional scepticism, ethical principles, and commitment to the public interest. However, the nomenclature for non-technical skills may differ. Example: Singapore has divided the criteria for non-technical competence into three (3) main components: ethics and professionalism, organisation and governance, and personal effectiveness. Each of these components has its subcomponents. For ethics and professionalism, the subcomponents are professional ethics, values and judgement, risk management and compliance, and business awareness and strategy. For organisation and leadership, the subcomponents are information and technology, critical thinking, reasoning, analysis and problem-solving, and management and execution of activities. For personal performance, this component includes self-awareness, managing oneself and others, and business communication. New Zealand divides non-

technical skills into personal, leadership, and business skills. Within each component, non-technical competence consists of the skills listed in Table 3.

Table 3: Comparative Professional Competency Skills by Professional Bodies in Seven Countries

Country	USA	Australia	Canada	Uganda	New Zealand	Singapore	Malaysia
Areas such as financial reporting, governance, reporting	√	√	√	√	√	√	√
Technical Competency							
Advanced	√		Level A	√			√
Intermediate	√		Level B	√			√
Foundation	√		Level C	√			√
Non-Technical Competency							
Intellectual Skills	√	√	√	√	√	√	√
Interpersonal and Communication Skills	√	√	√	√	√	√	√
Personal Skills	√	√	√	√	√	√	√
Organisational Skills	√	√	√	√	√	√	√
Professional Scepticism and Professional Judgement	√				√		√
Ethical Principles	√		√	√	√	√	√
Commitment to Public Interest	√			√	√	√	√

Based on the aforementioned findings, this study concludes that professional organisations around the world have developed a framework for professional competence. While most professional organisations have clearly defined areas for competency assessment, they have not provided a description of individual competencies related to non-technical skills. This means the specific criteria for determining whether an accountant fulfils the professional competencies are missing. In Malaysia, the MIA has identified seven (7) non-technical competencies that an accountant should possess for an accounting position. The seven (7) items are intellectual ability, interpersonal and communication skills, personal skills, organisational skills, professional scepticism and judgement, ethical principles, and commitment to the public interest. The content analysis revealed that there are no explicit descriptors or items that describe the individual non-technical skills. In other words, what exactly are intellectual abilities if one wants to measure them? To answer this question, the researchers conducted a semi-structured interview with a representative from the education sector.

This study, therefore, turns to a representative of the education industry for further information on the non-technical elements. The researchers interviewed the representative, the Deputy Director of the Centre for Leadership Profiling, about the Centre's current practices in assessing and determining the professional competencies of academic leaders. He clarified that his centre derives its leadership competencies framework from the Malaysian government for higher educational institutions, which subsequently influences the conceptualisation of the leadership competencies topics. According to Mr. A:

> "The leadership competency framework has successfully come up with a leadership competency framework for higher education institutions. The framework is composed of five (5) main clusters, mirroring the existing higher education leadership competency framework. The five (5) clusters include personnel effectiveness, cognition, leading, impact, and influence, and achievement and action."

Mr. A. gave his detailed understanding of the five clusters. He stated that the Centre developed the five (5) clusters through focus group discussions and individual interviews. The questions were developed with reference to the first framework for leadership in higher education, and some modifications were required (Spencer & Spencer, 1993). Mr. A remarked:

> "The focus group included individuals from the Leadership Competency and Instrument Committee, which consists of experts from various fields who have vast experience in leadership and were hence deemed suitable for this study, and the purpose of the focus group was to extract a richer view of leadership competency frameworks from the viewpoints of the committee."

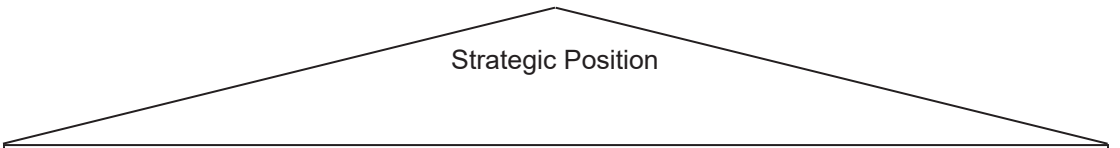
The issues discussed in developing the framework include cluster type, appropriate competency themes, cluster placement, and determining the suitability of the competency themes for assessing potential leaders in higher education institutions. According to the documents provided by Mr. A, this study shows the five (5) clusters of the professional competency framework from the education perspective. Table 4 shows the competency framework, which includes the description of each competency characteristic adopted from Mohamed Jais et al. (2021).

Table 4: Higher Education Competency Framework

Cluster	Competency	Description
Personal effectiveness	Self-confidence	The degree of certainty a person has about their ability to deal with situations is determined by complex internal processes of judgement and self-belief (Axelrod, 2017).
	Empathy	Individuals possess the capacity to perceive and comprehend the ideas and feelings of their colleagues (Gentry et al., 2016).
	Organisational commitment	The individual's identification with an organisation (Porter et al., 1974), consisting of a belief in the organisation's goals and values, hard work for the benefit of the organisation, and a strong desire to continue working for the organisation (Dirzyte et al., 2013).
	Value and ethics	The demonstration of appropriate behaviour through personal actions and interpersonal relationships through two-way communication, reinforcement, and decision-making (Brown et al., 2005; Cogaltay et al., 2016).
Cognition	Conceptual thinking	The cognitive capacity of an individual to comprehend and react to a situation also encompasses comprehending the potential moral and ethical predicaments (Batliwala, 2010).
	Analytical thinking	An individual's ability to analyse arguments, draw conclusions through inductive or deductive reasoning, and make judgements and decisions in order to solve problems (Paul, 1992; Willingham, 2007).
	Decision-making ability	Lucena, De, and Popadiuk (2019) describe a cognitive process that results in choosing beliefs or actions from a variety of options.
	Planning & organising	The deliberate process involves selecting and developing the best course of action to achieve clearly defined goals, while organising refers to the process of arranging tasks or resources for optimal use (Derue et al., 2011).
Leading	Teamwork & team leadership	Ability to work cooperatively with others in order to achieve organisational goals (Hunziker et al., 2011).
	Leveraging diversity	Ability to bring people from diverse backgrounds into their organisation (Jayne & Dipboye, 2004)
	Change leadership and adaptability	Different mindsets allow leaders to change and experiment as situations change (Uhl-Bien & Arena, 2018; Wang et al., 2017).
Impact & Influence	Impact & influence	Individual's ability to persuade and convince others to support an idea, agenda or direction, which is often linked to organisational performance (Mohamed Jais et al., 2020).
	Organisational & environmental awareness	Individual's understanding of the organisation and environment regarding current capacity, abilities, potentials and results (Kouzes & Posner, 2003).
	Networking/ relationship building	The ability to develop mutually beneficial relationships and partnerships based on trust, respect, and the achievement of common goals (Grayson & Baldwin, 2011).
Achievement and Action	Achievement orientation	How individual interests and reactions to tasks result in different patterns of cognition and behaviour? (Dweck & Leggett, 1988).
	Initiative & proactive behaviour	Individual's ability to find new ways to perform beyond what is expected (Albertyn & Frick, 2016).
	Information seeker	A person who asks questions, searches for new ideas, and is willing to explore new ideas in order to be better informed (Chan & Misra, 1990).

The researchers then interviewed a representative from the corporate sector. The interviewee explained the competency framework that his company uses and also presented the company's structure to the researchers. He explained that his company assesses an employee based on three (3) components. Firstly, the company assesses the candidate based on their academic qualifications, including the required degree and additional academic qualifications, such as professional qualifications. The second component used to assess a candidate is work experience in the form of required experience in years and additional experience in years. These two (2) components are targets, so the organisation has no difficulty determining whether the applicant is competent in academic qualifications and work experience. The interviewee then pointed out the third competency, technical and non-technical skills. Dr. I., the HR manager in one (1) company, stated:

> "In our organisation, the candidate will be assessed based on two competencies: technical competency skills and non-technical competency skills. Technical competencies are based on functional skills for the particular job family, while non-technical competencies are based on leadership competencies that span across job grades. This includes strategic visioning, engaging and developing talent, spirit of achievement, cultivating relationships, customer centricity, innovation and change, global acumen, raising the bar, and navigating complexity."



Competency Skills	
Technical Competency Skills	Non-technical Competency Skills
Working Experience	
Required experience (in years)	Additional experience (in years)
Academic Qualification	
Required academic qualification	Additional academic qualification (e.g. Professional)

Figure 1: Succession Planning Framework in Corporate Industry

The researchers also asked a business sector interviewee about the similarities between the MIA's professional competence and that of the education sector. The purpose is to obtain an external viewpoint. His response indicates that this study establishes similarities, making it suitable for consistent use and application. For a better understanding, this study needs clear terms to measure non-technical competence. The interview reveals that we can adapt the descriptor of non-technical competence in higher education to the MIA framework. Dr. I opined that:

> "I do believe that it is crucial for accountants because they complement technical expertise and enhance overall performance in a dynamic, complex work environment. I believe those items provided in the checklist should be taken into account when determining the professional competency of an accountant."

As a result, skills in all sectors, whether private or public, have the same components, namely technical and non-technical skills. This study shows certain similarities between the professional competences of the MIA and the education sector, which allow for standardised use and application. It is crucial to establish precise terminology for the measurement of non-technical competence. The interviews suggest that the public sector can adapt the descriptor for non-technical competences to the MIA framework from a higher education perspective. Therefore, Figure 1 shows the components of technical and non-technical skills.

This study, however, it shows that it is necessary to include the skills of professional scepticism and professional judgement, which are not included in the higher education competencies, as these skills are important for accountants (Ghani et al., 2023). This is in line with Mrs. C's opinion:

> "Professional scepticism is critical for public sector accountants due to the unique responsibilities and challenges associated with managing public resources and ensuring transparency, accountability, and integrity in financial reporting and decision-making. Public sector accountants are responsible for ensuring that taxpayer money is used appropriately and effectively. Professional scepticism helps them question financial practices, ensuring that public resources are managed efficiently and in accordance with regulation. You know... the public sector is vulnerable to fraud due to their large-scale operations and the complexity of transactions. I do believe that professional scepticism helps accountants remain alert to signs of fraud or corruption, ensuring that they critically assess transactions and financial statements for inconsistencies."

This study shows the results of aligning the MIA and leadership competence frameworks in education perspectives. The results are shown in Table 5.

Table 5: Alignment of MIA Framework and Competence Framework in Education

Cluster	Competency
Intellectual Skills	• Conceptual thinking
	• Analytical thinking
	• Decision making ability
Interpersonal and Communication Skills	• Planning and organising
	• Networking and relationship building
	• Teamwork and team leadership
Personal Skills	• Self confidence
	• Empathy
	• Information seeker

Table 5: Alignment of MIA Framework and Competence Framework in Education (Continued)

Cluster	Competency
Organisational Skills	• Leveraging diversity
	• Impact and influence (negotiation)
	• Initiative and proactive behaviour
Professional Scepticism & Professional Judgement	• Professional scepticism
	• Professional judgement
Ethical Principles	• Values and ethics
	• Adaptability
Commitment to Public Interest	• Achievement orientation
	• Organisational and environmental awareness
	• Organisational commitment

5.0 Conclusion

This study aims to explore a set of criteria for the professional competency of an accountant in the public sector and subsequently proposes a professional competency framework. The framework consists of technical and non-technical skills, as shown in Figure 2. Figure 2 shows that JANM needs to consider two (2) components when assessing a potential candidate, namely technical and non-technical skills. JANM must divide them into two (2) main subcomponents, namely specific and general functions. This ensures that JANM can assess the candidate against the specific functions that align with the account position's role. For the general functions, it can utilise the competency rubrics of IFAC and MIA.

Strategic Account Position

Competency Skills								
Technical Competency Skills		Non-technical Competency Skills						
Functional	Generic	Intellectual	Interpersonal & Communication	Personal	Organisational	Professional Scepticism & Professional Judgement	Ethical Principles	Commitment to Public Interest
13 strategic position job scope	Understanding problem Providing a solution Advising & reporting	Conceptual thinking Analytical thinking Decision making ability	Planning & organising Networking & relationship building Teamwork & team leadership	Self-confidence Empathy Information seeker	Leveraging diversity Impact & Influence Initiative & proactive behaviour	Professional scepticism Professional judgement	Values & ethics Adaptability	Achievement & orientation Organisational & environmental awareness Organisational commitment
Working Experience								
Required experience (in years)		Additional experience (in years)						
Academic Qualification								
Required academic qualification		Additional academic qualification (e.g. Professional)						

Figure 2: Proposed Succession Planning Framework for JANM

In terms of general technical skills, this study shows that three (3) main components are required, namely understanding the problem, providing a solution, and advising and reporting. The IFAC and MIA competency rubrics serve as the foundation for these three (3) components and are connected to the specific technical skills required for strategic positions. This study also suggested the inclusion of non-technical competency skills in the succession planning framework. The non-technical competency skills suggested in this study include intellectual, interpersonal and communication skills, personal effectiveness, organisational, professional scepticism and professional judgement, ethical principles, and commitment to the public interest.

This study is not without limitations. First, this study is exploratory. To illustrate, the initial proposed professional competency framework was adopted from the private and education sectors with some modifications suitable to the text of accountants in the public sector. Therefore, the conclusions of this study should be drawn with caution. Secondly, the quantitative analyses used in this study were limited to descriptive.

In sum, the proposed professional competency framework developed in this study can assist JANM in identifying risks associated with inadequate planning, such as skills shortages, leadership gaps, or non-compliance with financial standards. Early intervention can help mitigate the loss of qualified accountants to the private sector. In addition, with effective succession plans, the public sector can maintain high standards of financial accountability, even during leadership transitions. Consequently, these succession strategies can strengthen public confidence in government financial management.

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Internal Audit Practices Using Audit Command Language (ACL): A Case of a Statutory Body in Malaysia

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Abstract

Purpose: This study explores the applications of audit command language (ACL), one of the most widely used audit tools, in the internal audit practices of a statutory body in Malaysia. It examines how ACL is utilised to manage large volumes of data and expedite internal audit processes.

Design/ Methodology/ Approach: This study employs a single case study to gain insights into the internal audit practices using ACL. Specifically, the Organisation AHB, one of the Malaysian statutory bodies, was selected as a primary participant in the study. An in-depth interview was conducted with the Chief Internal Auditor (CIA) of the statutory body to understand how ACL was used in its existing internal audit practices.

Findings: The findings discovered that the internal audit process at the statutory body was relatively standard. An audit plan was prepared and reassessed every year. An audit committee then approved the audit plan. A risk-based approach was used for audits. In addition to Microsoft Excel, ACL was used as a primary audit tool at the statutory body due to its scripting capabilities, making it particularly effective for their audit processes. With ACL, an entire data population was tested instead of a small sample. The findings provide evidence that employing ACL has expedited its internal audit

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processes. While the organisation continues to pay for the licensing fees, the organisation believes that the benefits that an ACL offers far outweigh the cost. ACL helps this organisation manage its large volume of data to meet its audit objectives.

Originality/ Value: This study provides a unique contribution by offering an in-depth examination of how a Malaysian statutory body uses ACL in its internal audit practices. Unlike prior studies that focus on the factors influencing the use of audit tools in organisations, this study presents a case-based perspective, highlighting how statutory bodies specifically utilise these tools, especially within internal audit departments. The findings offer valuable insights for internal auditors, practitioners, and organisations considering the optimisation of ACL in their internal audit practices.

Keywords: Internal audit, audit tools, ACL, statutory bodies

1.0 Introduction

The technology and information revolution largely drives the ongoing changes in the business world. Auditing has significantly transformed, with computer-based methods increasingly replacing traditional paper-based approaches. Traditional audit practices, which often rely on manual processes and sample-based testing, are becoming less effective in addressing the risks faced by modern organisations. The modern business landscape demands real-time insights, the ability to analyse large volumes of data, and the need for continuous monitoring to gain insight and make timely decisions. The growing amount, diversity, and complexity of data require auditors to draw conclusions based on complex, real-time information (JS et al., 2024). For this reason, advanced audit tools, such as data analytics software, artificial intelligence (AI), and machine learning (ML), are used to enable auditors to conduct more comprehensive and accurate assessments. The integration of automation in these audit tools facilitates the timely detection of anomalies and risks, ensuring that organisations can respond proactively rather than reactively.

Audit tools play a crucial role in this process by streamlining various phases of the audit, from planning and risk assessment to executing audit procedures and reporting findings. Audit tools, such as computer-assisted audit techniques (CAATs), have been refined to assist auditors in carrying out their tasks more efficiently, especially within computerised accounting information systems (Jaber & Wadi, 2018). Employing CAATs in conducting an audit (Awuah et al., 2022) assists auditors in completing audit engagements (Braun & Davis, 2003). These tools enhance data collection and analysis, facilitate risk assessment, automate routine tasks, and support documentation and reporting, making audits more efficient and comprehensive. In addition, audit tools significantly enhance the capabilities of internal auditors by streamlining data collection, risk assessment, documentation and reporting. The applications of CAATs have become prevalent and essential for internal auditors seeking to maintain high audit quality standards, particularly in today's data-driven and technologically advanced business environments.

Some prominent examples are audit command language (ACL) and interactive data extraction and analysis (IDEA). However, not all auditors are well-versed in these tools. Some audit tools require specialised expertise and training to be used effectively. Mastery of these tools often involves understanding complex functionalities and advanced techniques, which are crucial for leveraging their full potential. Without adequate knowledge and experience, auditors may struggle to use these tools effectively, potentially limiting their ability to enhance audit quality and efficiency.

Many studies have extensively examined the role and impact of CAATs in enhancing audit effectiveness and efficiency (Awuah et al., 2022; JS et al., 2024; Mahzan & Lymer, 2014; Motubatse et al., 2015). A substantial body of literature was also quantitative, focusing specifically on the factors influencing the use of CAATs (Al-Hiyari et al., 2019; Purnamasari & Hartanto, 2022; Senan, 2024; Shamsuddin et al., 2015). However, there remains a lack of qualitative studies focusing on how statutory bodies specifically utilise these tools, especially within internal audit departments. This study, therefore, aims to explore the use of ACL, one of the most widely used audit tools, in the internal audit practices of a statutory body in Malaysia.

It is important to highlight that organisations adopting audit tools can result from an effort to promote the survival and legitimacy of organisational practices (Glover et al., 2014). In this context, the stakeholders considered such adoption as part of the sustainable practices appropriate for the organisation (DiMaggio & Powell, 1983). Therefore, this study employs institutional theory as its theoretical lens to explain the decision for digital transformation in a statutory body, which is often driven by various factors, such as social value, technological advancement and regulations (DiMaggio & Powell, 1983). This theory helps to understand how the practices are chosen. In this regard, Organisation AHB is willing to invest to pay for the licensing fee, even without a direct financial return.

This paper is structured as follows: The next section provides a literature review on internal auditing, audit approaches in internal auditing and existing audit tools. Following that, the research methodology is detailed in the subsequent section. Section four discusses the findings, while the final section offers the study's conclusions.

2.0 Literature Review

2.1 Overview of Internal Auditing

Today, the function of internal auditing has evolved. In its early stages, its main purpose was to support financial compliance and to act as an internal check alongside the external audits (Moeller, 2016). However, significant events such as the global financial crisis and the growing demand for accountability and transparency have pushed internal audit functions to become more proactive and strategic (Fülöp & Szekely, 2017; Sarens et al., 2009). Now, internal auditing has changed in response to regulatory reforms, stakeholder expectations, and technological advancements and plays an important role in governance, risk management and organisational performance (Arena & Azzone, 2009; Institute of Internal Auditors/ IIA, 2020). This change is consistent with the definition of internal auditing provided by the IIA. According to IIA (2024), internal auditing is defined as “an independent, objective assurance and advisory service designed to add value and improve an organisation’s operations where it helps an

organisation accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of governance, risk management, and control processes."

To cope with the increasing demands, internal auditors must find effective ways to manage multiple tasks within a limited time. One key strategy is using technology, as it could assist internal auditors in executing their responsibilities more efficiently and effectively. To ensure the efficacy and efficiency of the internal audit function, the audit process must be supported by technology, and the tools and systems used by the internal auditors must be regularly assessed (IIA, 2024).

2.2 Audit Approaches in Internal Auditing

An internal audit approach refers to the overall strategy or mindset that shapes how internal audit activities are planned, executed and reported. It sets the direction for the audit based on the organisation's objectives, risk landscape and operating environment (IIA, 2013; Mihret & Grant, 2017). Compared to outlining detailed procedures, the audit approach focuses on broader questions, such as what kind of audit is needed, why it matters, and where auditors should concentrate their efforts (Bailey et al., 2010; Pickett, 2010). This helps internal auditors align their work with the organisation's situation and risk appetite, and align with the expectations of key stakeholders. This closely matches how the IIA defines internal auditing. The phrase "systematic, disciplined approach" shows that internal audit work is structured and purposeful. A well-defined audit approach ensures that audits are not carried out in an ad hoc manner; instead, they follow professional standards and are attentive to the organisation's priorities (Mihret & Grant, 2017).

To meet the diverse organisation's needs, internal auditors may use various strategic approaches. These approaches bring unique strengths and show how internal auditors' roles have grown to meet higher risk, governance, and value creation expectations. For example, the risk-based approach directs audit attention to the areas of highest risk, allowing internal auditors to focus their resources on the important area (Arena & Azzone, 2009; IIA, 2013), which aligns with the risk management responsibilities of internal auditors. Fülöp and Szekely (2017) pointed out that internal auditors help organisations manage both operational and strategic risks by evaluating internal controls and governance structures. This role becomes more significant with the rise of digital and cybersecurity threats. On the other hand, integrated auditing merges financial, operational, information technology (IT), and compliance audits into one unified process (Daidj, 2022; IIA, 2012a). It offers a holistic view of risk and could increase efficiency, especially in large or complex organisations. The IIA (2012b) notes that this supports a more comprehensive understanding of an organisation's risk environment, positioning internal audit as a stronger governance partner.

On the other hand, continuous auditing is another approach gaining momentum, particularly as technology transforms the audit profession. Sağlar and Kefe (2021) point out that techniques like artificial neural networks and decision trees could assist auditors in detecting fraud and assessing risks in real time. These allow auditors to go beyond traditional sampling, enabling ongoing monitoring and quicker response times (Alles et al., 2008; Sağlar & Kefe, 2021). When paired with tools like CAATs, continuous auditing gives timely insights that support real-time risk management (Li et al., 2018). Agile auditing, on the other hand, has also become a critical approach in fast-changing environments. It focuses on flexibility, collaboration and

responsiveness, enabling audit teams to adapt quickly as new risks emerge (Christ et al., 2021; Vasarhelyi et al., 2020). Agile methodologies keep internal auditors in step with organisational changes and remain relevant in the face of digital disruption and increasing complexity. Whether using a risk-based, integrated, continuous, or agile approach, internal auditors follow a structured process to evaluate risks, plan their work, and provide assurance that supports governance and performance (Arena & Azzone, 2009; Christ et al., 2021). Altogether, these approaches reflect IIA's vision of internal audit as a structured and value-driven function.

Nevertheless, putting these approaches into practice is not always easy. Smaller organisations, or those in the public sector, often face struggles with limited staff, insufficient technology, or a lack of access to specialised expertise that can hinder the adoption of more advanced approaches like continuous or agile auditing. Resistance to change and rigid systems could slow things down, making it difficult for audit functions to fully shift towards more dynamic or integrated models (Arena & Azzone, 2009; Mihret & Grant, 2017). However, when resources are in place, the solution is clear: using digital audit tools and technologies to implement these approaches more effectively. By using digital audit tools, auditors can overcome these challenges, supporting risk assessment, enabling data-driven decision-making and facilitating real-time monitoring.

2.3 Existing Audit Tools

Using CAATs has revolutionised traditional audit procedures, enabling auditors to improve audit effectiveness, efficiency and accuracy. The audit tools offer automation capabilities that allow auditors to manage large volumes of data and enhance risk detection. The CAATs incorporate business intelligence audit software, database applications and electronic audit working papers (Al-Okaily et al., 2022; Siew et al., 2020), enabling auditors to deliver more comprehensive and reliable audit outcomes. According to Mahzan and Veerankutty (2011), audit tools allow internal auditors to get higher degrees of assurance in their testing procedures while promoting ongoing risk monitoring in a financially efficient manner (Hespenheide, 2006).

Along with tools like ActiveData for Excel and TeamMate Analytics, which expand Microsoft Excel with advanced data analysis capabilities, the most popular CAATs are IDEA and ACL (Dias & Marquez, 2018; Serpeninova & Makarenko, 2020). Most small audit companies use electronic spreadsheets for financial audits of less complicated systems in small businesses. Conversely, larger enterprises that provide comprehensive IT and audit services use sophisticated methods and tools, whereas smaller to medium-sized businesses with more significant resources spend money on generic audit software (Rosli et al., 2013).

CAATs are crucial for fraud detection because their automated analytical processes include integrated analysis instructions that do not require programming knowledge (Adeyanju & Adenikinju, 2023; Dimitrijević & Kalinić, 2017). In addition, it also provides scripting functions for auditors looking to construct more specialised and programmable commands (Dimitrijv & Kalinic, 2017). In a recent study in Egypt, Al Natour et al. (2023) found that an auditor's self-efficacy and fraud detection are moderated by the deployment of CAATs. In this situation, auditors' ability to detect fraud may be influenced by their self-assurance and whether they employ sophisticated auditing tools like CAATs. In a similar vein, Silalahi et al. (2022), in their study on the influence of CAATs and professional ethics on auditor performance, recapitulated that CAATs could enhance the auditor's performance. Therefore, leveraging CAATs in audit

processes enables auditors to increase efficiency, accuracy, and effectiveness, thereby improving audit outcomes.

Unlike ACL, an audit software management system that integrates analytics, IDEA is largely a data analysis tool intended to help the audit process (Hall & Ziltz, 2019). IDEA is a tool that auditors use to precisely discover errors, issues, frauds, and patterns by extracting, totalling, sampling and editing data. Additionally, it provides auditors with strong instruments for organising large datasets and quickly identifying irregularities. When used in time series audits, IDEA can generate point forecasts, producing a single value for each prediction (Leite & Silva, 2018). This feature helps the auditor make more accurate and well-informed decisions throughout the audit process by improving their capacity to identify trends over time. According to Persson-Holmes and Lyngsten (2020), IDEA software is the most popular CAAT among mid-tier and small audit firms. This preference is due to IDEA being a commercially developed audit tool offering a straightforward, cost-effective solution. For mid-tier and small audit firms, which may lack the resources to develop custom audit software, IDEA provides a practical and accessible option for enhancing their audit capabilities (Persson-Holmes & Lyngsten, 2020).

While ACL and IDEA offer specialised features that streamline audit processes, improve accuracy, and enhance fraud detection capabilities, the applications of Microsoft Excel remain crucial in many auditing environments. This use is attributed to the features of Microsoft Excel, which are versatility, accessibility and lower implementation cost (Varma & Khan, 2014). Henry et al. (2023) recapitulated that Microsoft Excel remains a favourite among firms, with many using it alongside their proprietary software packages or commercially available tools. For this reason, Microsoft Excel is commonly used for extracting data, cleaning (scrubbing) and performing detailed testing (Henry et al., 2023). Nevertheless, Smidt et al., (2019) explained that employing Microsoft Excel in auditing indicates a lower level of maturity because of its limitations. The limitations include the capability of Microsoft Excel to efficiently handle large datasets, its vulnerability to errors, especially when cleaning data is done from multiple sources and the potential for human errors in determining the formula that can skew analytical results. Additionally, when using macros or multiple Pivot projects, the testing and analysis process can become time-consuming and complex (Smidt et al., 2019).

In summary, advanced audit tools like ACL and IDEA have transformed auditing by enhancing efficiency, accuracy and fraud detection. These tools enable auditors to handle large datasets and automate complex processing, reducing errors and improving audit effectiveness. While Microsoft Excel remains widely used due to its accessibility and cost-effectiveness, especially in smaller audit firms, it has limitations in handling large datasets and complex analyses. Despite this, combining Microsoft Excel and specialised audit tools like ACL and IDEA helps auditors achieve more comprehensive and reliable audit outcomes.

3.0 Research Methodology

This study adopts a single case study approach to explore the internal audit practice using ACL within a statutory body in Malaysia. It is part of the qualitative research approach that explores the respondents' experience using their own terms (Smith et al., 2009). In this context, the focus is on understanding how particular phenomena (a real-world ACL application) have been understood from the perspective of a particular people in a particular context (Organisation AHB). Similarly, Yin (2009) exhibits that a single case study offers detailed insights into a

specific context. Hence, the lessons learnt are assumed to be informative about the experience of the institution (Yin, 2009). Such an approach enables an in-depth understanding of a real-world ACL application in a specific organisational context. Using a qualitative lens to understand such applications would offer detailed insights that might not be evident through a quantitative research approach.

Data were gathered via an in-depth interview with the Chief Internal Auditor (CIA) at one of the statutory bodies in Malaysia. In this context, Organisation AHB was selected due to its daily management of a large volume of data and its adherence to government regulations, procedures, and compliance policies. Such focus is crucial for understanding how ACL is used in its internal audit practice.

An in-depth interview allows the researcher to obtain comprehensive information that reveals the participant's perspective, experiences and the derived meaning of the specific topic (Rutledge & Hogg, 2020) related to using audit tools in their internal audit function. The interview transcript was analysed using thematic analysis to identify the key themes related to the application of AI in Malaysia's statutory body. The established themes were cross-checked with the interview transcript to enhance their credibility. Institutional theory serves as the underlying theoretical framework to guide the analysis.

4.0 Discussion of Findings

4.1 About the Statutory Body

Organisation AHB is a statutory body offering comprehensive financial services and products, such as savings and current accounts, Islamic banking and investment products. The organisation has more than 400 branches in Malaysia, including mini branches. Each state has a main branch that serves as the primary branch for that state. The internal audit department at this organisation comprises 43 staff members, led by the interviewee, who has been working at the organisation since 2017. The internal audit structure is organised under the CIA, with six (6) divisions. One division focuses solely on auditing the head office, and other divisions, such as financial risk and Shariah audits, specialise in risk management, treasury and Shariah compliance.

4.2 Existing Audit Practices in Organisation AHB

According to the interviewee, the internal audit process at Organisation AHB is relatively standard. Each year, the audit team prepares an audit plan, reassesses and creates a three (3) -year plan. This plan is then presented to the audit committee for approval. Once approved, the team proceeds with the audits. The process is clear and transparent, ensuring the audit committee knows the number of off-site and on-site audits conducted. Like other financial institutions, the organisation is regulated by Bank Negara Malaysia, which conducts regular audits. This regulatory requirement makes the internal audit process more stringent than that of non-financial institutions.

The Organisation AHB used a risk-based approach for audits. Firstly, the audit team begins the audit process by identifying and reassessing auditable areas within the organisation. Next, based on the criteria determined by the team, the identified area is categorised into three

(3) main categories: high, medium or low risk. Based on the three (3) categorisations, the team determined the frequency of audits. For high-risk areas, they will be audited annually. Considering the risk-level changes, the audit team proposes a mid-year assessment (mid-year review) from the audit committee to revise any areas that need revisions or new additions to the existing audit plan. This procedure is based on the remarks by the following interviewee:

> "Based on changes in the risk levels, we may need to revise certain audits we have planned or add new ones. These revisions or additions are then presented to the audit committee for their approval. For example, if we feel certain audits need to be dropped or added due to changes in risk, we must obtain the audit committee's approval before making any adjustments."

The interviewee further added that Organisation AHB utilises numerous back-end systems to support its operation, approximately 200 to 300, but not all of them are audited regularly:

> "The organisation has many systems, approximately 200-300, each with different functionalities. There are integrated systems as well as standalone ones. For example, HR has its own system. The deposit and loan functions are combined into a single system, while the credit card system operates separately."

Following a risk rating system, IT systems classified as low risk are not audited every year. However, all systems are audited within a three (3) - year cycle, ensuring that even the lowest-risk systems are audited at least once every three (3) years.

Further, the interviewee explained that the organisation has policies and standard operating procedures (SOPs) or audit manuals in the auditing function. These policies need Board approval, which will be reviewed every three (3) years. In contrast, SOPs do not require Board approval but need to be reviewed every two (2) years, regardless of whether there have been any changes.

As part of governing the internal audit function in Organisation AHB, the interviewee explained the following:

> "We adhere to the standard where every five (5) years, we engage an external auditor to review our process. According to the international internal audit standards, at least once every five (5) years, a review must be conducted. So, every five (5) years, we call in auditors for this purpose."

4.3 The Use of ACL in Organisation AHB

Explaining the history of ACL usage at Organisation AHB, the interviewee revealed that when he joined the organisation, the ACL was already in place, but was not utilised effectively. As part of his role, he ensured that the application was fully utilised. This is crucial as ACL requires scripting capabilities, where not everyone is able to use the features effectively. Since then, ACL has been continuously used as its audit tool alongside Microsoft Excel. ACL is the primary audit tool at Organisation AHB due to its scripting capabilities, making it particularly effective for their audit processes. Scripting capabilities enable users to automate repetitive

audit tasks and customise their analyses according to specific audit objectives. This is consistent with the description of ACL given by Lin and Wang (2011) on selecting ACL as an auditing software that has a command mode for auditors that are familiar with the programming language (scripting). With this embedded function, ACL's scripting allows the auditors to create custom scripts tailored to their specific audit needs, alongside the ability to automate repetitive data analysis functions.

Responding to the ACL, the interviewee remarked the following:

> "Previously, when we started using ACL, we ensured it was fully utilised. Unlike Microsoft Excel, ACL requires scripting, which not everyone can do. Initially, we had four staff members proficient in scripting, but one has since resigned, leaving us with three. We also have one person who can conduct ACL training, and we brought in another expert from a vendor company. These individuals are adept at scripting. Each team here, when they need specific data, must go to these experts, explain their requirements, and have the necessary scripting and parameters set up in ACL to generate the required exceptions."

When asked about the number of ACL licences the organisation currently subscribes to, the interviewee explained that previously, there were more licences. However, many were not actively used, prompting a reduction. The organisation subscribes to ACL and ACL™ Analytics Exchange (AX). ACL AX offers scheduling capabilities and is more advanced than standard ACL. The organisation currently invests approximately RM160,000 every two (2) years for ACL licences.

The interviewee was also asked about the benefits of using audit tools. He explained that:

> "…and how big is the data of that company, you cannot do without tools because we are big…so imagine if there are 10 million customers, nine (9) million accounts, if you want to see how it is going, you cannot just take 30 samples, so you have to go this, you have to use tools to make sure that you are not left behind…We no longer take samples, like 30 or 20; that is a thing of the past. Nowadays, we run tests on the entire population. If there are 500,000 records, we check all 500,000."

The interviewee mentioned that ACL is used for various digital audit processes. Auditors can use ACL during planning, analytics and reporting. ACL is not used for every issue. It is primarily for recurring or management-concern issues, especially those requiring immediate resolution rather than waiting for a scheduled audit. The audit team must communicate with the relevant personnel about the data they need. Continuous auditing is also performed using ACL, with specific data runs every month. The system includes scheduling through ACL AX and running monthly processes automatically unless changes are needed. The results are validated to ensure accuracy.

> "…the ACL AX… it runs automatically… it runs every month, generates results, and if we need to make changes, we need to validate its exceptions to ensure accuracy."

The interviewee also mentioned that the IT department manages all data. The audit department does not retrieve data from individual branches but requests it from the IT department. The internal audit department still relies on the IT department for data access rather than retrieving it themselves. This is part of the governance process in Organisation AHB.

The interviewee was further asked how the tools help find red flags. The interviewee responded:

> "Red flags are something we need to determine ourselves first. The tool cannot identify the red flag on its own; we have to tell it what we want to identify. We have to determine what we consider a red flag, and then the tool will do it for us. This requires the experience of our auditors. The team needs to brainstorm and come up with what we think are the red flags. Once we come up with new parameters, the tool will generate exceptions based on the identified red flags. For example, if it generates 50 or 40 exceptions, we have to validate each one to see if it is correct or genuine… We have to verify each case. A red flag is just a red flag, but whether it's a fraud or not, we have to validate."

In summary, ACL is considered the best practice audit tool in the context of Organisation AHB, one of the statutory bodies in Malaysia. Despite the need to pay high licensing fees (approximately RM160,000 every two years for ACL licences), the organisation believes that ACL has significantly assisted the auditors in performing their internal audit functions. This finding is consistent with Lin and Wang (2011), who found that ACL was ranked high on the priority list for users due to its data processing capabilities and system functionality. Their findings also revealed that users of ACL particularly were satisfied with the ACL command function, which was rated highly for 5.0 its effectiveness (Lin & Wang, 2011).

5.0 Conclusion

Numerous studies have been conducted to understand the factors influencing the use of audit tools within organisations. However, limited research has focused on how statutory bodies utilise such applications, particularly in the internal audit department. This case provides evidence that ACL helps Organisation AHB manage its large volume of data and expedites its internal audit processes.

The findings offer valuable insights for internal auditors, practitioners and organisations to learn the benefits of using audit tools in internal audits and consider the optimisation of ACL in their internal audit practices. Additionally, statutory bodies should also recognise the challenges associated with ACL implementation (high costs and appropriate training required) whereby understanding these challenges helps them address these challenges and adopt a more structured approach when implementing audit tools.

To better integrate ACL into audit workflows, statutory bodies can focus on a few strategies. First, provide ongoing training and capacity building to ensure they fully utilise the features and understand how the tools can be used to strengthen their audit process. Additionally, ACL can also be leveraged to automate repetitive audit tasks, such as data anomaly, to significantly improve audit efficiency. Moreover, a continuous monitoring and improvement process can be established using feedback from audit results to refine ACL usage and adapt to emerging risks.

The findings of this study are, however, based on a single case study. Future research should consider incorporating multiple case studies to provide richer and more comprehensive data.

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Tax Voluntary Disclosure and Tax Amnesty: A Systematic Literature Review

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Abstract

Purpose: Tax voluntary disclosure (TVD) and tax amnesty (TA) are vital to enhancing tax compliance and governmental coffers. The current systematic literature review (SLR) aims to synthesise recent studies related to the current topic by focusing on articles published between 2022 and 2024 and acquiring a comprehensive understanding of how TVD and TA influence taxpayer behaviours and governmental fiscal health.

Methodology: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework was implemented to ensure a rigorous selection and analysis process. A total of 23 final articles were identified, included, and analysed from reputable academic databases, including Scopus, Web of Science (WoS), and EconBiz, to extract relevant data in terms of study objectives, methodologies, findings, and future directions.

Results: The findings were categorised into three primary themes, namely (1) economic impacts, (2) behavioural aspects, and (3) legal and institutional frameworks, related to TVD and TA. Notably, varying impact levels were discovered due to country-specific contexts and implementation strategies, which propounded the importance of carefully designed TVD and TA programmes.

Originality: Future directions were also offered, including longitudinal research to assess long-term impacts and comparative analyses across various jurisdictions. Valuable insights were contributed to policymakers and researchers to improve existing tax systems via TVD and TA initiatives.

Keywords: Tax voluntary disclosure, tax amnesty, systematic literature review

1.0 Introduction

Tax voluntary disclosure (TVD) and tax amnesty (TA) play essential roles in the contemporary landscape of tax administration to elevate tax compliance and short-term revenue generation rates (Aini et al., 2023; Koch & Müller, 2024; Pratama & Pratiwi, 2022) . Both programmes are developed to encourage taxpayers to proactively disclose and declare previously underreported or unreported income and overstated expenses or reliefs, which can assist in broadening the tax base and enhancing the transparency degree of the tax system. Increasing globalisation and technological advancements have also enabled higher diversity in tax evasion methods, which necessitates effective TVD and TA programmes (Bhalla et al., 2022). Specifically, TVD allows taxpayers to amend tax reports without severe penalties associated with non-compliance behaviours (Al-Nasrallah, 2023; Boateng et al., 2022; Chung et al., 2023), which can foster a cooperative relationship between taxpayers and tax authorities through an effective framework for individuals and businesses to resolve past omissions. Furthermore, incentives, such as reduced fines, immunity from audits, and more favourable terms for resolving outstanding tax liabilities, are offered, which strikes a balance between strict enforcement and incentivised compliance through a more inclusive and efficient tax system (Demin & Efremova, 2022; Pham et al., 2023). Meanwhile, TA is generally more comprehensive and time-bound, which enables taxpayers to resolve tax arrears by paying a defined sum typically below the actual liability rate within a specified period (Abdurrahmani & Doğan, 2019; Kesuma, 2021). The Directorate General of Tax defines TA as the elimination of tax liability, including the exemption of fines and sanctions for tax crimes (Ridhawati et al., 2020). The programme is frequently introduced during economic downturns or fiscal crises to swiftly boost governmental coffers (Canavire-Bacarreza et al., 2023; Hajawiyah et al., 2021), which not only provides immediate fiscal relief but also reintegrates non-compliant taxpayers into the formal economy for improved future compliance.

Baihaki et al. (2024) highlighted frequent confusion regarding both TVD and TA owing to high similarity levels. Baer and Borgne (2008) described TA as a limited-time offer from the government, which allows specific taxpayers to resolve existing tax debts by paying a stipulated amount. The government will exonerate past debts, including interest and penalties, and protect taxpayers from legal actions. Comparatively, the OECD (2015) denoted TVD as a programme enabling non-compliant taxpayers to resolve tax issues under specific conditions. Tax authorities do not waive tax under the TVD programme. The effectiveness of TVD and TA programmes has also been widely debated among policymakers, economists, and tax professionals. Proponents contended that the initiatives are critical to addressing the tax gap or difference between the owed tax amount and the collected amount by including hidden income and assets into the tax net (Johannesen et al., 2020). The programmes can lead to increased taxpayer awareness and education and promote a culture of long-term compliance. Meanwhile, the critics underscored that both TVD and TA might unintentionally motivate non-compliance demeanours by creating a misperception that the government is lenient towards tax evaders (Gould & Rablen, 2020; Langenmayr, 2017). Queries on the fairness of the programmes might also arise as the programmes might appear to reward tax evaders who have not fulfilled tax obligations at the expense of compliant taxpayers (Rukundo, 2020). Thus, the effectiveness of the initiatives depends on the design and implementation specificities, including the level of waived penalties, the duration of the programme, and the subsequent enforcement measures.

Existing empirical evidence on the impacts of TVD and TA programmes is mixed as outcomes significantly vary across various jurisdictions and contexts. While certain nations have successfully implemented the programmes to increase tax revenues and improve compliance, other countries have been observed with only short-term gains with minimal long-term benefits (Langenmayr, 2017). The role of institutional factors, such as the efficiency of tax administration, public trust in government, and the overall economic environment, is also pivotal to determining the success of the initiatives (Inasius et al., 2020; Sudarma & Darmayasa, 2017; Yücedoğru & Sarisoy, 2020). Both TVD and TA programmes are effective instruments for tax authorities to garner potential benefits in terms of increased revenues and compliance (Yan, 2023). Nevertheless, the design and implementation aspects require careful consideration to prevent potential pitfalls and ensure positive contributions to the integrity and effectiveness of the tax system. The programs will remain a key focus of tax policy discussions and reformations as nations continue encountering alternative challenges of tax evasion and the demand for sustainable revenue streams. The current study performed a SLR to comprehensively examine tax compliance and TA due to the increasing scholarly interest. An SLR provides a structured and transparent methodology for synthesising existing research, identifying trends, and highlighting literature gaps compared to traditional narrative reviews (Paul et al., 2023). An SLR also enables a holistic understanding of how TVD and TA impact compliant behaviours across jurisdictions amidst the ongoing evolution of tax policies and enforcement mechanisms. The current SLR could consolidate recent findings between 2022 and 2024, which could guarantee high relevance for policymakers and academicians exploring effective tax administration strategies.

2.0 Literature Review

Both TVD and TA programmes have been instrumental in developing and implementing fiscal strategies across multiple nations to address the issues related to tax evasion and compliance rates. Marpaung et al. (2023) underscored the integral function of TA in economic development by emphasising the impact on repatriation funds and overall economic growth in Indonesia. Marpaung et al. (2023) performed linear regression with a dummy variable to demonstrate that government spending, TA, tax revenue, and Gross Domestic Product (GDP) positively contributed to economic growth and illustrated the multifaceted benefits of such policies in revitalising a contracting economy. Sultan et al. (2023) also explored the implementation issues of TA schemes in Pakistan and discussed the challenges in aligning relevant TA schemes with anti-money laundering regulations and the implications for the financial industry. The findings revealed ambiguous long-term benefits due to the complexities of regulatory compliance and enforcement despite the ability of TA to increase short-term revenues. In addition, Soepriyanto et al. (2024) assessed the impact of chief executive officer (CEO) age on the tendency of firms to participate in TA programmes in Indonesia and uncovered a negative correlation between CEO age and participation in TA, which posited that older CEOs were more predisposed to be more risk-averse and less inclined to engage in such programmes. The results also underscored the role of individual decision-makers' characteristics in the effectiveness of TA initiatives. Conversely, Doğan and Abdurrahmani (2021) examined taxpayers' attitudes towards TA in Kosovo and demonstrated that the underlying factors for support encompassed decreasing administrative burdens and short-term revenue gains. Doğan and Abdurrahmani (2021) also delineated concerns about fairness and the potential for TA programmes to undermine long-term compliance.

Canavire-Bacarreza et al. (2023) empirically analysed different TA modalities by conducting a laboratory experiment in Bolivia. The findings discovered that extended TAs with debt deductions heightened compliance rates, although the extension did not significantly boost total revenues compared to one-shot amnesties, which suggested that extended TAs might not be as effective in motivating low-compliant individuals despite the capability to encourage high-compliant individuals to disclose and declare underreported taxes. Therefore, TA programmes should be carefully designed to balance short-term revenue objectives with long-term compliance goals. Kays (2022) also appraised the impacts of mandated disclosure on voluntary disclosure behaviours among Australian companies and revealed that corporations frequently supplemented mandatory disclosures with additional voluntary information to manage reputational risks. The findings highlighted the strategic corporate behaviours in response to regulatory changes and propounded that transparency initiatives could result in more sophisticated disclosure strategies among firms and complicate the enforcement landscape despite the objective to deter aggressive tax planning. Simultaneously, Nurhadian and Khoirunurrofik (2022) evaluated service quality and public satisfaction with Indonesian TA programmes through the Gronroos service quality model and structural equation modelling (SEM). The results uncovered that both functional and technical quality significantly impacted taxpayers' perceptions of service quality and overall satisfaction, which posited that the success of TA programmes not only depended on fiscal incentives but also on the quality of delivered services and the perceived trustworthiness of tax authorities. The reviewed studies provided a nuanced understanding of voluntary disclosure and TA policies, with potential benefits and limitations. The effectiveness of relevant policies was context-dependent owing to the presence of multiple factors, including the regulatory environment, individual decision-makers' characteristics, and the quality of service delivery. While TAs could offer immediate fiscal relief and enhance compliance, long-term success requires careful design and implementation by considering both economic and behavioural dimensions. The effectiveness and implications of TA programmes have been a popular academic topic due to the presence of various dimensions, including taxpayer morality, economic impacts, and compliant behaviours.

Aytekin (2021) discussed the implementation of TA programmes in Turkey, which demonstrated the complex interplay between policy design and economic outcomes. Wardhani and Pratama (2022) explored the influence of individual taxpayer morality on participation in TA programmes and discovered that higher levels of moral cognition, moral courage, and moral identity significantly increased taxpayers' tendency to participate in relevant TA programmes. The results suggested that moral considerations played a critical role in taxpayer decisions, which contributed valuable insights into designing policies aimed at improving tax compliance. Erizal et al. (2022) also scrutinised the broader impacts of the Indonesian 2016 TA policy and highlighted the success in terms of revenue declaration while elucidating shortcomings in repatriation targets due to unprepared economic structures. Sundari et al. (2022) investigated the mediating role of tax awareness in the relationship between TA and taxpayer compliance and emphasised the necessity of enhancing taxpayer awareness and the quality of services offered by tax authorities to achieve higher compliance rates. While TA programmes could directly influence compliance rates, the results demonstrated that effectiveness was significantly elevated when taxpayer education and service quality were improved. Additionally, Tarigan et al. (2022) offered empirical evidence based on the natural resource sector in Indonesia by demonstrating how TA initiatives substantially influenced corporate social responsibility (CSR) and share prices. The findings indicated a significant increase in CSR activities after implementing TA programmes, which led to higher share prices and underscored a nuanced benefit of TA beyond immediate

fiscal outcomes. Darma et al. (2022) also conducted a bibliometric analysis of the reaction of the Indonesian capital market to TA policies and uncovered that relevant policies profoundly impacted market dynamics. The results highlighted that TA could catalyse economic activities by encouraging the repatriation of funds to stimulate market confidence and investment.

Ahmed et al. (2022) scrutinised and contextualised the Pakistani 2019 tax amnesty scheme within the broader framework of economic governance and elite influence. The results underscored the challenges experienced in implementing relevant schemes owing to entrenched elite interests, which frequently undermined policy effectiveness. Koch and Müller (2024) also examined the behavioural impacts of anticipated TA schemes and discovered that predictable TA programmes could reduce overall tax compliance through an implicit safety net for tax evaders. The experimental evidence highlighted the critical need for strategic and unpredictable implementation of TAs to maintain compliance incentives. Moreover, Mujiyati et al. (2022) appraised the association between TA, tax avoidance, and corporate value and discovered that TA programmes might inadvertently encourage continued tax avoidance behaviours despite the potential to increase corporate values by reducing tax liabilities. The dual outcome underscored the importance of integrating stringent monitoring and compliance measures after implementing TA programmes to deter tax avoidance behaviours. Lauletta and Montano Campos (2023) also demonstrated that TA programmes in Argentina could result in marginal increases in property tax compliance, especially among taxpayers enrolling in payment plans. The findings propounded that the design and implementation of payment methods played a vital function in sustaining compliance gains after implementing TA programmes. Furthermore, voluntary disclosure programmes in Malaysia have been a primary academic topic among scholars appraising tax compliance and revenue collection strategies. One prominent initiative is the Special Voluntary Disclosure Programme (SVDP) introduced by the Inland Revenue Board of Malaysia (IRBM) (Seng, 2023) to incentivise taxpayers to disclose previously undeclared income through reduced penalties and immunity from further audits. Ahmad et al. (2022) demonstrated a significant increase in voluntary disclosures during the programme period due to clear communication and incentives provided by the IRBM. Prihastuti et al. (2022) also analysed the behavioural responses of taxpayers to voluntary disclosure initiatives and discovered that trust in the tax authorities and the perceived fairness of the tax system played crucial roles in influencing taxpayers' decisions to participate in relevant programmes. The results uncovered that taxpayers who believed the government would employ the tax revenue effectively were more inclined to disclose personal income voluntarily. The legal and institutional frameworks supporting voluntary disclosure programmes in Malaysia were also critically examined by past researchers.

3.0 Justifications on Tax Voluntary Disclosure and Tax Amnesty

Both TVD and TA continuously play a critical role in addressing specific tax gaps, offshore tax evasion, corporate non-compliance, and revenue shortfalls, although developed nations do not encounter widespread tax compliance issues and both TVD and TA are not frequently implemented as primary tax strategies compared to certain developing nations (Johannesen et al., 2020). Both programmes act as preventive measures rather than corrective tools to ensure sustained compliance and fiscal integrity, especially among developed economies to combat offshore tax evasion and undisclosed assets instead of serving as broad tax recovery mechanisms. For instance, the United States of America (USA) introduced the Offshore Voluntary Disclosure Programme (OVDP) to encourage taxpayers to report hidden foreign

accounts, whereas the United Kingdom (UK) implemented similar tax regularisation schemes to address tax avoidance and undeclared offshore wealth (Gould & Rablen, 2020; Langenmayr, 2017). Comparatively, developing countries utilise TA more frequently to recover lost revenue and widen the tax base. The TA programme successfully increased national revenue in Indonesia while Argentina and Turkey implemented multiple TAs to resolve the issues of fiscal deficits (Erdoğdu & Akar, 2022; Gojali & Tarmidi, 2023; Lauletta & Montano Campos, 2023). Relevant TA programmes are frequently introduced alongside broader tax reformations to strengthen compliance in Africa (Wadesango et al., 2020)

4.0 Study Contributions

The current study served as a valuable resource for research students by synthesising recent literature on tax compliance, TVD, and TA from 2022 to 2024. A structured and comprehensive literature review highlighting key trends, theoretical perspectives, and empirical findings on the current topic was offered by systematically reviewing articles indexed in renowned academic databases, namely Scopus, WOS, and EconBiz.

5.0 Material and methods

5.1 Identification

Three (3) key SLR phases were conducted to identify and select relevant articles. The first phase encompassed defining pertinent keywords by searching for related terms via a thesaurus, dictionaries, encyclopaedias, and previous studies, which led to specific search strings for the Scopus, WoS, and EconBiz databases (see Table 1). Resultantly, a total of 2,779 articles were gathered.

Table 1: The Search String

Database	Search String
Scopus	TITLE (“voluntary disclosure*” OR “tax amnest*”) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2024)) AND (LIMIT-TO (DOCTYPE , “ar”)) AND (LIMIT-TO (LANGUAGE , “English”)) AND (LIMIT-TO (PUBSTAGE , “final”))) Access date: 26 May 2024
WoS	“voluntary disclosure*” OR “tax amnest*” (Title) and 2024 or 2023 or 2022 (Publication Years) and Article (Document Types) and English (Languages) Access Date: 26 May 2024
EconBiz	(title:((“voluntary disclosure*”) OR (“tax amnest*”)))) Access Date: 26 May 2024

5.2 Screening

Initial screening encapsulated a review of gathered articles to guarantee the consistency of the article content with the established research questions. Common content-related criteria were employed, including terms related to voluntary disclosure or TA in the title and removing duplicates, which omitted 2,499 articles and 280 articles were retained and further reviewed

through exclusion and inclusion criteria (see Table 2). The primary criterion was journal articles as the literature type was the primary source of practical recommendations. Accordingly, reviews, meta-syntheses, meta-analyses, books, book series, chapters, and conference proceedings were excluded from the current SLR. The articles were also required to be published in English between 2022 and 2024, with another 137 articles removed due to duplication.

Table 2: The Selection Criteria

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2022 to 2024	Before 2022
Literature Type	Journal (Article)	Conference, Book, or Review
Publication Stage	Final	In-Press

5.3 Eligibility

The third phase, namely eligibility assessment, involved 143 articles, in which a comprehensive examination of the title and core content was performed to ensure the fulfilment of the stipulated criteria and relevance to the study objectives. A total of 118 articles were excluded owing to not being within the study scope, containing insignificant titles, irrelevant abstracts based on the study objectives, or without full-text access based on empirical evidence. Hence, only 23 articles were retained for further review.

5.4 Data Abstraction and Analysis

An integrative analysis was conducted to appraise and synthesise various research designs, which were primarily quantitative methods. Figure 1 depicts the meticulous analysis of the final 23 articles in terms of assertions, materials related to the current topic, and the employed methodology. The current author also collaborated with other co-authors to develop pertinent themes, with logs retained throughout the data analysis process to record any analysis, perspective, query, or notion related to data interpretation. Furthermore, the results of the 23 articles were compared to identify any inconsistencies in the theme developmental process through discussion to resolve any conceptual disagreement. Consistency was also guaranteed by modifying generated themes via consensus among the current author and co-authors. Subsequently, two (2) academicians and one industrial expert reviewed the themes to ensure high clarity, significance, and appropriateness of each sub-theme via ascertained domain validity. The questions on TVD are as follows:

1. What are the economic impacts of TVD and TA programmes?
2. What are the behavioural factors influencing TVD and TA programme effectiveness?
3. Do legal and institutional frameworks, including service quality and trust in government, impact TVD and TA effectiveness and long-term compliance?

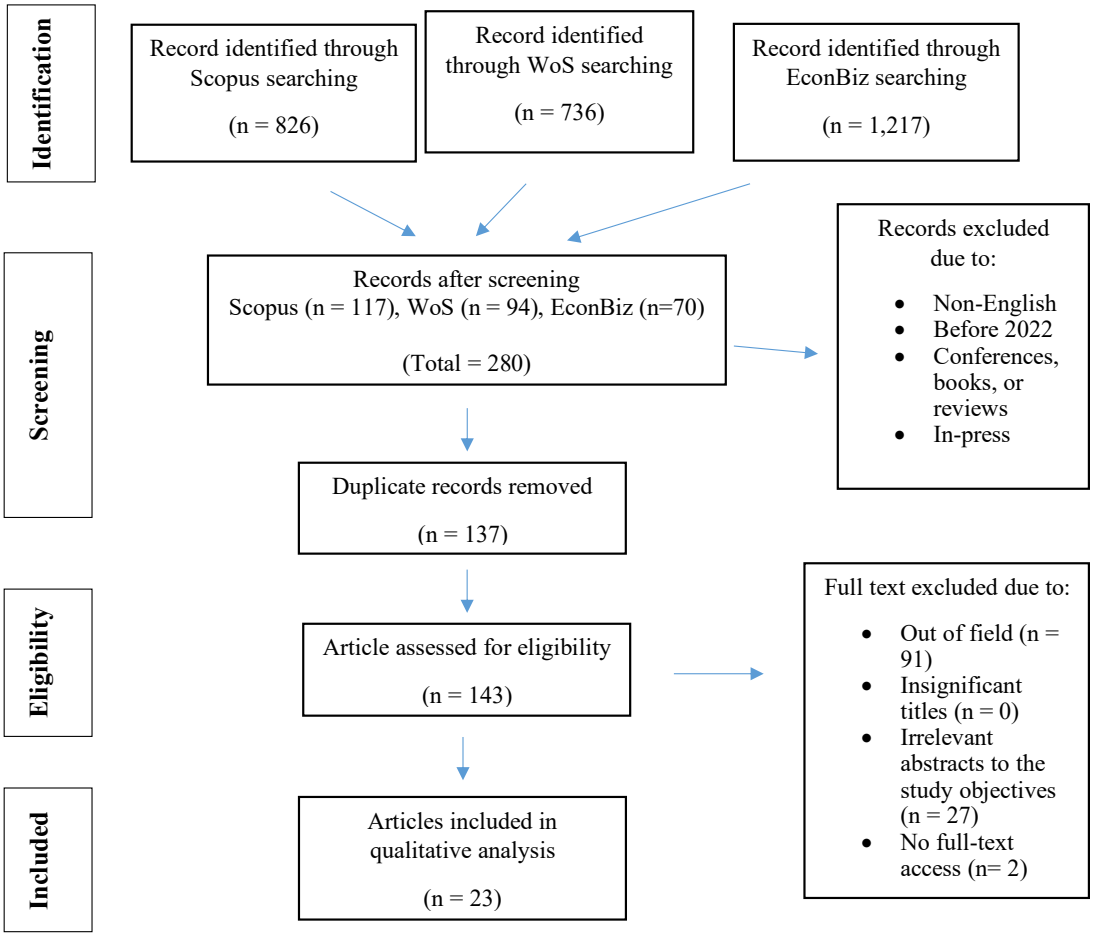

Figure 1: The Flow Diagram of the SLR Process (Moher et al., 2009)

6.0 Findings

6.1 Economic Impacts of Tax Amnesties

A total of seven (7) articles were analysed within this theme, wherein five (5) articles were related to companies while the remaining two (2) pertained to TA on the general economy involving both individuals and companies. Table 3 portrays the summary of the seven (7) studies.

Table 3 : Summary of Economic Impacts of TAs

No.	Authors	Objective	Methodology	Findings
1.	Khan and Nuryanah (2023)	To examine the impact of tax policy, particularly TA, on tax aggressiveness in Indonesia	Multiple regression analysis through a sample of 402 observations from manufacturing companies listed on the Indonesian Stock Exchange (IDX) (2013-2018).	Internal governance mechanisms (independent commissioners and institutional ownership) and company characteristics (leverage and profitability) significantly impacted tax aggressiveness, with TA as an inefficient tool in combating tax aggressiveness.
2.	Ngelo et al.,(2022)	To assess the relationship between tax avoidance and investment efficiency in Indonesia	Analysis of 2064 firm-year observations from Indonesian listed firms (2010-2019) via multiple regression and propensity score matching regression to address endogeneity	A positive relationship existed between tax avoidance and investment efficiency, especially among firms that did not participate in TA.
3.	Marpaung et al. (2023)	To analyse the impact of TA policy on Indonesian economic development	Linear regression with a dummy variable to examine governmental spending, TA, tax revenue, and GDP	Governmental spending, TA, tax revenue, and GDP positively and significantly influenced economic growth.
4.	Erizal et al. (2022)	To appraise the impact of the 2016 TA policy on economic development in Indonesia	Descriptive, literature study, and library research via a qualitative approach, with data collection via documentation study and interviews	The TA policy was successful in achieving declaration targets but not in repatriation due to unprepared supporting policies and economic structures.
5.	Santoso et al., (2023)	To investigate the association between tax planning and firm value with TA as a control variable.	Panel data regression analysis of manufacturing firms on the IDX (2014-2017) to measure tax planning by Effective Tax Rate (ETR) and Cash Effective Tax Rate (CETR) and firm value by Tobin Q.	Tax planning could increase firm value, with CETR producing a significant impact when TA was a control variable. The ETR produced a greater impact than CETR on firm value.
6.	Mujiyati et al. (2022)	To scrutinise the linkage between TA and company value and analyse the role of tax avoidance behaviour	Multiple linear regression model on 216 observations from manufacturing companies listed on the IDX (2017-2020)	The TA increased company value and encouraged tax avoidance, which enhanced company value.
7.	Tarigan et al. (2022)	To examine the correlation between CSR and share price before and after TA	Panel data analysis and paired sample T-test on 83 Indonesian listed firms in the natural resources industry through the Kinder, Kinder, Lydenberg, and Domini's (KLD measurement approach for CSR performance	Significant differences in CSR performance and TA impacts existed on share prices before and after taxation periods. CSR performance aided investors in valuing share prices.

6.2 Behavioural Aspects of Impacts of Tax Amnesties

The TA programme significantly influenced taxpayer behaviours and compliance rates. Specifically, tax awareness and the behaviours of tax authorities played vital roles in promoting taxpayer compliance. Sundari et al. (2022) demonstrated that tax awareness partially mediated the association between TA and tax compliance and highlighted that efficient and friendly tax authorities could boost taxpayer compliance. Devano et al. (2024) also discovered that TA programmes improved taxpayer morality and elevated compliance rates. Particularly, taxpayer morality, which encompassed moral cognition, courage, and identity, significantly impacted the decision to participate in TA programmes, which corresponded to Wardhani and Pratama (2022). Demographic factors also played a pivotal function in TA participation. Soepriyanto et al. (2024) also assessed the influence of CEO age on firm participation in TAs and discovered that older CEOs were more risk-averse and less inclined to participate in relevant TA programmes. The findings underscored the impact of leadership characteristics on corporate tax behaviour and the overall effectiveness of TA policies, which aligned with Erdoğdu and Akar (2022) contending that the medium- and long-term impacts on tax justice and income distribution were frequently negative despite the short-term revenue gains through TAs. The complexity of TA impacts was further elucidated by Nuryanah and Gunawan (2022), who analysed the behavioural trends of tax compliance before and after the 2008 TA policy in Indonesia. The results uncovered that corporate tax aggressiveness increased, especially among firms with foreign investors, although individual taxpayer compliance improved after implementing TA programmes. The results highlighted the varying impacts of TAs on different taxpayer categories and the significant role of international factors. Collectively, prior scholars emphasised the need for policymakers to consider the behavioural aspects of tax awareness, morality, demographic factors, and international involvement when designing and implementing TA policies to increase compliance rates and ensure equitable tax systems.

6.3 Legal and Institutional Frameworks of Tax Voluntary Disclosure and Tax Amnesty

The TA programme, which is a recurrent feature in the tax systems across multiple nations, is developed to elevate compliance rates and revenue collection by offering delinquent taxpayers an opportunity to disclose previously unreported income with reduced penalties. The legal and institutional frameworks governing TA programmes can significantly influence effectiveness and long-term outcomes. Lauletta and Montano Campos (2023) scrutinised the impact of a TA programme on property tax compliance in Argentina, wherein the difference-in-difference approach revealed a slight increase in compliance after implementing the TA programme, particularly among wealthier taxpayers who enrolled in the amnesty payment plan. The findings underscored that the positive impacts of TAs might be limited to certain demographics despite the ability to temporarily boost compliance, which highlighted the need for targeted policy design to ensure broader compliance improvements. Similarly, Abd Hamid et al. (2022) emphasised the importance of demographic factors and institutional roles, such as the IRBM, in influencing tax awareness and compliance through the SVDP. The results underscored the necessity of robust institutional frameworks and public awareness initiatives to support the success of TAs. Leenders et al. (2023) also provided insights into the distribution of tax evasion in the Netherlands and demonstrated that tax evasion was highly concentrated among the wealthiest households, which suggested that TAs produced a modest impact on reducing wealth inequality due to the sophisticated evasion strategies employed by the affluent group

of individuals. Therefore, institutional frameworks should effectively address the complexities of offshore tax evasion and implement stringent measures to enhance the efficacies of TAs. Nurhadian and Khoirunurrofik (2022) also revealed that the perception of service quality in TA programmes significantly impacted taxpayer satisfaction and compliance, which necessitated effective institutional frameworks to guarantee high service quality to foster positive taxpayer engagement.

Koch and Müller (2024) appraised the insurance impact of TAs and uncovered that predictable and repeated amnesties might reduce overall tax compliance by providing a safety net for evaders, which underscored the need for unpredictable and stringent enforcement measures to be incorporated into TA programmes to prevent inadvertently encouraging non-compliance behaviours. Sultan et al. (2023) also discussed the challenges in implementing TA schemes alongside anti-money laundering regulations in Pakistan owing to inconsistent legislation and frequent amnesties, which undermined the efficacy of both tax compliance and financial regulations and posited the importance of coherent and stringent legal frameworks for the success of TAs. Simultaneously, Angeli et al. (2023) investigated the influences of tax concessions in Italy, especially in regional taxation, and discovered that frequent amnesties led to a decline in long-term compliance. The results indicated that taxpayers who previously benefited from TAs were more predisposed to default on future tax obligations and postulated that legal frameworks should limit the frequency of amnesties to avoid creating a culture of non-compliance. Kurniawan et al. (2023) also evaluated the role of trust in government and tax justice in Indonesia and demonstrated that TAs combined with patriotic appeals significantly enhanced compliance intentions. The findings underscored the importance of incorporating trust-building measures and equitable tax policies within the institutional frameworks governing TAs. In addition, Adhariani et al. (2024) explored the interplay between corporate governance, voluntary disclosure, and tax amnesty policies and uncovered that robust corporate governance mechanisms could complement TA programmes to improve compliance. Adhariani et al. (2024) also highlighted the organisational inertia in response to TAs, particularly in the Indonesian mining industry where TAs produced a marginally negative impact on CSR disclosure. The findings posited that institutional frameworks should promote dynamic and flexible corporate practices to maximise the benefits of TAs.

7.0 Discussion, Conclusion, and Limitations

Both TVD and TA produced varying impacts on taxpayer behaviours, the economy, and the legal framework. The economy received short-term benefits, such as increased national tax revenue, although the effectiveness depended on the post-amnesty policy and strict enforcement. Behaviourally, a negative influence was observed on morality and the perception of the unfairness of benefits between the wealthy and the common persisted despite TA and TVD being capable of increasing immediate compliance and income. Legally, successful TVD and TA necessitate targeted policy design, robust enforcement measures, and improved tax administration to guarantee long-term compliance and fairness in the tax system. Economically, TAs offered short-term fiscal relief but could aggravate income inequality when the benefits were disproportionately provided to wealthier individuals. Integrating the TA programme into a broader compliance strategy, including robust enforcement and education, is essential to ensure programme effectiveness through a legal and institutional framework with coherent legislation, high-quality service delivery, and trust-building initiatives. Limiting the frequency of waivers and ensuring unpredictable enforcement can also assist in maintaining high tax compliance rates.

Meanwhile, several limitations exist in this study. The present study exclusively employed secondary data from Scopus, WOS, and EconBiz databases, which might unintentionally omit relevant policy reports, governmental documents, or ambiguous literature that could provide additional perspectives on TA and TVD programmes. The focus on articles published between 2022 and 2024 could also potentially neglect historical trends and long-term evaluations of TA effectiveness. Previous findings were gathered from various jurisdictions with different tax systems, enforcement policies, and economic conditions, which might restrict generalisability to different contexts. Summarily, the long-term effectiveness of TVD and TA relies on comprehensive and well-designed policies to address behavioural, economic, and institutional factors despite the immediate benefits. Optimal integration of enforcement, facilitation, and trust in the theoretical matrix introduced by Wan Mohd Azmi and Masuri Md Daud (2024) could be employed by tax authorities as a guide to improving tax compliance.

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Threshold Analysis of Governmental Developmental Expenditures and Relevant Impacts on the Association of Southeast Asian Nations (ASEAN)

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Abstract

Purpose: Sustainable economic growth serves as the top priority for global governments, especially in rapidly developing regions. The allocation of governmental developmental expenditures plays an essential role in economic strategies by directing financial resources towards infrastructure, education, health, and technology initiatives, which potentially leads to productivity improvements and private sector investments despite the actual impact yet to be determined.

Objective: The current study seeks to analyse how governmental developmental expenditures contribute to economic growth through non-linear associations among the Association of Southeast Asian Nations (ASEAN) countries.

Methodology: Panel threshold regression was conducted to appraise the study hypothesis, which could flexibly measure how governmental developmental expenditures influenced economic growth through observations from 10 ASEAN nations between 2000 and 2022.

Variables: The independent variable was governmental developmental expenditures while Gross Domestic Product (GDP) per capita was the dependent variable, with inflation, foreign direct investments, and gross national expenditures serving as control variables.

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Results: The critical threshold value was identified as 1.2696, which suggested slower economic growth when governmental spending remained below the threshold while surpassing the threshold would lead to limited additional benefits. Hence, a balanced approach to public spending is essential, wherein governmental spending effectiveness relies on the allocated budget, economic structure, governance framework, and institutional capacity.

Policy Recommendations: The ASEAN governments should develop and implement a targeted developmental budget strategy to exceed the stipulated threshold in preventing risks from underspending. While expanding governmental budgets is critical, the priority is also enhancing efficiency within essential sectors, including infrastructure, education, and technology.

Conclusion: The present study analysed the most optimal method to allocate governmental budgets for development. The findings demonstrated that spending above the stipulated threshold did not significantly contribute to economic growth among ASEAN nations. Simultaneously, underspending would constrain the economy, which posited that sufficient budgets and effective leadership were pivotal factors.

Originality/ Value: The current study demonstrated to the policymakers that sufficient governmental budgets are imperative for national development and economic growth among ASEAN countries.

Keywords: Governmental developmental expenditures, economic growth, ASEAN nations, panel threshold regression

1.0 Introduction

Sustainable global economic growth is one of the top priorities for governments across nations, particularly in fast-developing regions, including the ASEAN. The ASEAN comprises 10 heterogeneous economies, which encompasses Indonesia, Malaysia, Thailand, and Vietnam, with significant economic transformations in the past few decades driven by active governmental policies and the rapid expansion of globalised value chains (Ngigi et al., 2023). Investments from the public sector have also resulted in considerable productivity growth and encouraged participation from the private sector, which has generated a ripple effect on economic generation. While supporters perceive governmental developmental expenditures as vital for long-term economic growth, the actual impact remains ambiguous (Pesaran et al., 2001), particularly among heterogeneous regions, such as the ASEAN. Simultaneously, numerous theoretical frameworks have been developed to delineate the association between governmental spending and economic growth. Keynesian economic theory posits that an increase in government spending can elevate aggregate demand and employment, especially during economic downturns. Wagner's Law postulates that the demand for the expansion of public expenditures or governmental spending will be higher as the economy progresses. Nonetheless, existing empirical evidence remains inconclusive as certain scholars have discovered a positive relationship while others have revealed negative or mixed impacts (Santanu & Wardani, 2023, Saroj et al., 2023). The Gross Domestic Expenditure (GDE) is the most relevant aspect to developing countries

with immature or insufficient infrastructure and human capital. Aschauer (1989) elucidated that public investment in infrastructures can reduce transactional costs while increasing accessibility to markets and creating a favourable environment for the growth of the private sector. Investments in both educational and healthcare sectors can also contribute to higher labour productivity, which is critical to long-term economic sustainability (Fan et al., 2000). Nonetheless, the success of GDE depends on budget allocation efficiency, governance quality, and suitability to wider economic policies. Effective governmental funding disbursement can attract more foreign direct investment (FDI), generate more employment opportunities, and improve economic efficiency, whereas excessive spending, mismanagement, or corruption can undermine the aforementioned benefits and result in unsustainable public debts (Afonso et al., 2008). The ASEAN serves as a unique context for accessing the impacts of governmental developmental expenditures on economic growth in different developmental phases and institutional capacities. The Malaysian approach to infrastructure development through different projects, such as the East Coast Rail Link (ECRL), demonstrates how governmental investments directed toward specific objectives could assist in improving connectivity and regional cohesion. Hence, infrastructure development remains the most visible outcome of general developmental expenditures, especially investments in roads, railways, ports, and energy systems that can lower business costs and enhance trade (Rahman, 2023). Infrastructure development enables ASEAN countries to emerge as attractive investment locations to foreign investors who prefer to invest in regions with high-quality infrastructure (Aschauer, 1989). Nevertheless, budget constraints and unexpected economic shocks can impose significant challenges to maintaining the investments.

Human capital development is essential to promoting economic growth, with quality education and healthcare catalysing the transformation to a skilled and productive workforce to foster higher innovation and participation in high-value industries. Past researchers demonstrated that improved public health outcomes, including reduced illness-induced absenteeism, substantially enhanced national productivity and GDP growth (Barro, 1991). Public investment in research and development (R&D) could also profoundly lead to higher technological advancements, product innovation, and economic diversification, which are integral to sustaining economic growth in the contemporary competitive global economy (Romer, 1990). Furthermore, GDE plays a pivotal role in poverty alleviation and income distribution through pertinent programmes, such as social welfare schemes, housing initiatives, and food security measures, to facilitate inclusive growth by increasing living standards and participation in the economy among the lower-income population categories. Reducing poverty and inequality can ensure social stability, which is critical to long-term economic growth (Khan & Senhadji, 2000). Nevertheless, several prerequisites should be achieved to guarantee the effectiveness of GDE in promoting economic growth, including efficient and transparent fund allocation on infrastructural and social projects to prevent potential corruption. High project quality should also be maintained as ineffectively implemented infrastructure or social programmes would not generate the intended results. Concurrently, public spending is required to be consistent with fiscal sustainability to prevent high debt levels that can obstruct private investment and destabilise macroeconomic conditions when borrowing for developmental projects (Easterly & Rebelo, 1993). Moreover, policymakers are required to comprehend the GDE impact on ASEAN economic growth and identify factors capable of maximising GDE benefits towards fostering fair regional development. The current study also aims to determine the factors contributing to the non-linear relationship between GDE and economic growth among ASEAN member countries, with GDE aiding in enhancing economic prosperity. A threshold estimation

analysis was conducted from 2000 to 2022 to contribute insights into promoting governmental investment efficiency via sustainable economic growth. The findings would also offer policy recommendations on the most optimal method to allocate public resources across ASEAN economies. Section 2 reviews the existing literature relevant to GDE and associated economic implications. Section 3 delineates the methodology adopted in the current study, including data sources and analytical techniques. Section 4 discusses empirical findings and major insights generated through the analysis. Section 5 concludes the study by summarising key findings with policy implications and future directions.

2.0 Literature Review

Financial developmental spending of the government, such as infrastructure, education, healthcare, and overall national development, provides momentum to economic development. The existing debate is related to how GDE can act as a determined engine for economic growth as relevant operations depend on factors, such as governance, policy effectiveness, and allocation strategies. The current study would offer an overview of the existing literature on GDE and economic growth and assess gaps or challenges in the employed methodologies, on top of alternative insights. Specifically, past studies highlighted that GDE significantly impacted economic performance both positively and negatively, including in India with increases in domestic consumption and investments that led to higher GDP growth (Kumar, 2024). Similarly, prior scholars in Nigeria discovered that both capital and recurrent expenditures profoundly contributed to creating a platform assisting in attaining long-term growth despite the associated short-term fiscal pressures (Jibir et al., 2023). Nonetheless, most studies conducted time-series analyses on country-specific dynamics, which neglected regional trends and broader implications for economic integration, particularly in ASEAN economies.

High-quality institutions can foster effective GDE. For instance, robust financial institutions in Sub-Saharan Africa have maximised the returns from governmental expenditures by ensuring efficient resource allocation, whereas substandard governance has led to governmental fund misallocations and inefficiencies (Musah et al., 2024). Robust institutions in developed countries can also reduce corruption while promoting efficient public spending (Sidek & Asutay, 2021). Meanwhile, numerous researchers did not extensively scrutinise the specific institutional mechanisms in terms of regulatory efficiency or fiscal transparency to garner deeper insights into the underlying factors of GDE success or failure. The ASEAN economies also remain underrepresented in the current topic despite the differences in governance regimes and economic settings. In addition, debates remain on the optimal GDE level and composition. Certain academicians propounded that excessive public spending may lead to inefficiencies, inhibit private-sector participation, and create fiscal imbalances (Ansari et al., 2021) while other scholars contended that targeted investments should be aligned with the economic priorities of a specific country. Previous academicians in Malaysia also delineated that ineffectively executed interventions by the government would lead to diminishing returns despite the ability of FDI to drive economic growth (Ramlan & Latip, 2023). Additionally, other researchers from the ASEAN-5 countries (Indonesia, Malaysia, Phillipines, Singapore and Thailand) uncovered that high levels of inefficient government spending impeded instead of facilitating economic progress (Rajabi & Muhammad, 2013). Collectively, the results underscored the absence of distinctive insights in differentiating between capital and recurrent expenditures, particularly among ASEAN nations.

A majority of prior scholars utilised conventional econometric techniques, such as ordinary least squares (OLS) and autoregressive distributed lag (ARDL) models, to appraise the impacts of fiscal policies. The limitations of both aforementioned techniques include the assumption of a linear association between governmental spending and economic growth, and fiscal policy analysis might not adequately capture the complexities of the association. More advanced methodologies, including panel vector autoregression (PVAR) and machine learning models, have also not yet been fully utilised in scrutinising the current topic. Accordingly, the present study sought to fill the gap by applying a panel ARDL model, which allowed for a more dynamic analysis of both short- and long-term GDE impacts while determining variations across ASEAN countries. Meanwhile, Babalola (2015) highlighted those productive governmental expenditures substantially influenced long-term economic growth, especially in education and capital formation. Strategic public investment and trade liberalisation could also strengthen economic resilience in South Asia (Symoom, 2018). While existing studies have discussed investments in infrastructure and human capital, only limited studies have delineated how fiscal discipline and policy consistency impact such investments and how such policies are shaped by fiscal constraints in ASEAN countries. Therefore, a gap exists in comprehending the distinctive challenges of the ASEAN region. Ambiguous findings also exist on the governance issue and the balance between capital and recurrent spending and the most optimal methodology for analysing the relationship, although certain academicians analysed the GDE role in economic development. The panel ARDL model focusing on the ASEAN economies in this study could offer alternative empirical evidence to be leveraged by policymakers to develop long-term and sustainable economic growth.

3.0 Methodology

The current study assessed the non-linear correlation between GDE and economic growth among ASEAN countries through Hansen's (1999) panel threshold regression method, which assisted in identifying non-linear GDE trends and threshold levels that altered the impact on economic growth when crossed. The model determined the number and position of threshold points endogenously and enabled a more flexible identification of undetected thresholds even in rapidly fluctuating conditions. The findings could provide a refined understanding of how varying GDE levels could either stimulate or hinder economic growth. Furthermore, Hansen's (1999) panel threshold regression offers more advantages compared to other forms of non-linear estimation by serving as a classical linear regression model for the endogenous calculation of threshold points. Classical regression models generally assume a constant influence of GDE on economic growth, which allows more detailed observations regarding non-linear relationships and different GDE impacts on governmental spending levels. Moreover, panel threshold regression is more flexible and data-oriented compared to other techniques, such as polynomial regression or interaction terms, which can minimise the probability of establishing arbitrary thresholds. Panel threshold regression was suitable for the current study due to significant differences in fiscal capacities and structural variables among ASEAN countries, in which a single linear model could not comprehensively capture the intricacies of expenditure-growth dynamics. Thus, panel threshold regression ensures optimal identification of crucial spending levels, which can aid policymakers in optimising public investment plans. The structure of the panel threshold regression model is as follows:

$$Y_{it} = \begin{cases} \beta_1 X_{it} + \varepsilon_{it}; \ GDE \leq \gamma \\ \beta_2 X_{it} + \varepsilon_{it}; \ GDE > \gamma \end{cases} \quad (1)$$

The GDP growth is denoted by Y_it while X_it refers to the vector of factors impacting the output, including governmental expenditures, exports, consumption spending, and FDI. The GDE functions as a threshold variable and could be employed to divide the sample into two different groups if GDE exceeds or below certain acceptable thresholds. The threshold also enables grasping how variables influence GDP expansion when GDE degrees vary. Accordingly, the threshold estimation method was utilised based on Chan (1993) and Hansen (2000), wherein the concentration sum of squared errors over all observations was minimised to determine the threshold without relying on prior knowledge. A data-driven estimation approach was also utilised to search the threshold value endogenously to decide whether to reject a null hypothesis or not. A rejection suggests that a threshold impact is embedded within the GDE and economic growth relationship. Nevertheless, the threshold estimate under the null hypothesis will not be distinctive and typical test statistics cannot be employed. Hansen (1996) proposed a bootstrapping solution based on the p-value of the threshold estimate to fit the model with both assumptions under the null hypothesis (linearity) and alternative assumptions (threshold at γ) based on the actual likelihood ratio test statistic computed via the following formulae:

$$F_1 = \frac{S_0 - S_1(GDE^*)}{\hat{\sigma}^2} \quad (2)$$

$$\hat{\sigma}^2 = \frac{1}{n(t-1)} S_1(GDE^*) \quad (3)$$

Where $\hat{\sigma}^2 = \frac{1}{n(t-1)} S_1(GDE^*)$ represents the residual variance. Subsequently, a bootstrap procedure was applied to generate alternative samples based on the residuals of the estimated threshold model. The model was re-estimated under both null and alternative hypotheses for each bootstrapped sample, and the likelihood ratio test statistic was computed. The p-value was derived from the proportion of bootstrapped test statistics that surpassed the actual value. A confidence interval for the threshold estimate γ was established when a threshold effect was detected to determine the ranges of the threshold effect. Hansen (2000) derived the appropriate distribution function and critical values, namely c(α), for the likelihood ratio statistic to formulate a confidence interval based on the GDE values for the likelihood ratio statistic below c(α). The next step was to estimate the model parameters for the two regimes, namely β_1 for GDE below the threshold and β_2 for GDE above the threshold, after the threshold γ was identified. The technique allowed the researcher to capture the varying GDE impacts on economic development across different expenditure schemes to provide a more nuanced understanding of the linkage between governmental spending and growth dynamics among ASEAN countries.

4.0 Results and Discussion

Table 1 demonstrates the descriptive statistics, which is a summary of the indicators highlighting differences in economic performance and GDE across ASEAN nations. The average GDP per capita was 3.5990, with moderate variation (standard deviation: 0.5656) ranging from 2.7164 to 4.8284, which reflected economic diversity. Gross national expenditure averaged 1.9649 with minimal variation (standard deviation: 0.0851), which indicated stable spending patterns. Meanwhile, inflation rates demonstrated significant fluctuations, with values ranging from - 1.2605 to 5.0246 and a high standard deviation of 4.9612. Exports were indicated as a percentage of GDP average at 1.9135 with variability (standard deviation: 0.7176), which reflected differences in trade dependence. Final consumption expenditure remained relatively stable at a mean of 1.8339 (standard deviation: 0.1382). Conversely, FDI inflows substantially varied ranging from - 1.7529 to 32.6912 with a high standard deviation (6.3788), which posited profound differences in foreign investment levels. The GDE reached a maximum of 4.4736, with variability (standard deviation: 1.3680) reflecting differing fiscal priorities among ASEAN nations.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
GDPC	3.5990	0.5656	2.7164	4.8284
GE	1.9649	0.0851	1.6840	2.2741
INF	4.6548	4.9612	-1.2605	5.0246
EX	1.9135	0.7176	1.0188	4.2833
C	1.8339	0.1382	1.4983	2.4827
FDI	5.4714	6.3788	-1.7529	32.6912
GDE	1.3680	0.4584	0.7939	4.4736

Notes: The GDPC is a dependent variable measured based on GDP per capita (constant 2015 US$); GE = Gross national expenditure (% of GDP); INF = Inflation, consumer prices (annual %); EX = Exports of goods and services (% of GDP); C = Final consumption expenditure (% of GDP); FDI = Foreign direct investment, net inflows (% of GDP); GDE = Government development expenditure (% of GDP).

The model was estimated with one, two, and three thresholds to identify the number of thresholds. All three bootstrap tests comprised the same number of replications (300). Table 2 summarises the threshold estimates for several models, in which the single-threshold test demonstrated a threshold estimate of 1.2696 significant at a 5% level with a bootstrap p-value of 0.0133. Contrarily, the double and triple-threshold models yielded non-significant bootstrap p-values. Hence, the results postulated that the model consisted of one threshold. The findings of the threshold regression analysis also revealed that the relationship between GDE and economic growth among ASEAN countries was non-linear, which propounded two distinct regimes depending on the threshold level of GDE estimated at 1.2696% of GDP. Thus, the GDE impact on economic growth varied depending on whether spending exceeded or below the threshold. Figure 1 depicts the concentrated likelihood ratio function of the threshold estimate, namely LR(γ), with 95% confidence intervals based on a single threshold value. The findings demonstrated the estimated thresholds at 1.2696.

Table 2: Threshold Estimate Results across Different Threshold Models

Model	Threshold	F-Statistic	Bootstrap p-value	Critical Value at 10%	Critical Value at 5%	Critical Value at 1%
Single Threshold	1.2696	61.04	0.0133	39.3670	45.0866	61.2791
Double Threshold	1.2696 1.3144	12.29	0.3467	18.8668	21.9911	30.0761
Triple Threshold	1.1672 1.2696 1.3144	9.14	0.9733	40.5787	45.2300	54.8081

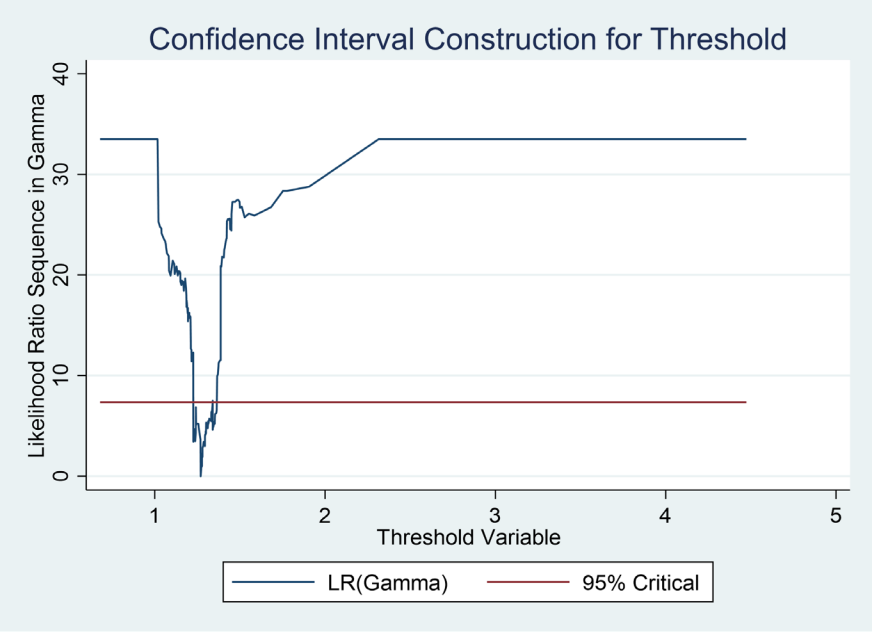

Figure 1: Plots of the Concentrated Likelihood Ratio with the Single Threshold
(Note: 95% Confidence Intervals)

Table 3 portrays the threshold regression analysis results. Particularly, GDE was discovered to be below the first threshold and negatively impact economic growth, as indicated by the coefficient of - 0.1077 with a highly significant p-value below 0.001. The findings posited that lower GDE levels were unproductive or potentially detrimental due to suboptimal resource allocation, mismanagement, or inadequate competence to properly implement developmental programmes. As such, limited GDE would lead to low economic returns, which emphasised the importance of both the quantity and quality of governmental spending. Bayraktar (2019) also explicated that public investment was less effective among low-income countries owing to the threshold effect, in which investment was required to reach a certain level before significantly and positively impacting economic growth. In addition, the second threshold was revealed to demonstrate a statistically insignificant impact on economic growth when the GDE was 1.2696 or larger. The impact on the economy also profoundly diminished when governmental spending surpassed a certain level, with a substantially low coefficient of - 0.0042 and a p-value of

0.779. The results corresponded to the concept of diminishing returns, which propounded that additional government spending would not produce further economic benefits (Romer, 1990) and might engender inefficient and counterproductive outcomes, which highlighted the importance of careful fiscal management (Nguyen, 2022). Resource misallocation would also restrict private investments and create dependence on governmental support, which further aggravated the situation. Mimoun and Raies (2022) elucidated that ineffective governance and limited political freedom significantly reduced the effectiveness of social spending among developing countries due to the lack of effective mechanisms to ensure effective fund allocation and usage for poverty reduction. In addition, the findings were consistent with past research on the impacts of governmental spending depending on the overall economic circumstance and partially on the implementation approach (Hansen 1999; Shafuda & De 2020). The policymakers of ASEAN countries should consider relevant factors when implementing developmental programmes.

Table 3: Regression Estimate Results via a Single Threshold Model

Variable	Coefficient	Standard Deviation	T-Statistic	p-value
Governmental Expenditure	0.0358	0.1554	0.2300	0.8180
Inflation	- 0.0059	0.0012	- 4.5000	0.0000
Export	0.3711	0.0605	6.1300	0.0000
Consumption Expenditure	0.0688	0.0779	0.8800	0.3790
Foreign Direct Investment	0.0056	0.0020	2.7300	0.0070
Threshold Estimate		1.2696		
Below	- 0.1077	0.0225	- 4.7700	0.0000
Upper	- 0.0042	0.0152	- 0.2800	0.7790
R-squared		0.4769		
F-test		21.2300		
p-value		0.0000		
Bootstrap p-value		0.0133		
Number of Bootstrap Replications		300		

The findings underscored the significance of considering GDE, existing economic structures, governance models, and institutional capabilities. According to Sidek and Asutay (2021), institutional quality plays a crucial role in determining the impact of governmental expenditures on economic growth. Environments with robust institutions can assist in consumption and developmental expenditures in promoting economic growth through decreased corruption and political risks. Targeted fiscal policies are also imperative without implementing a universal spending approach. Governments should concentrate public resources in the most crucial areas while reinforcing national objectives by focusing on citizenship benefits to produce higher impacts. Governments should also refrain from solely developing initiatives without coherence, which can dissipate scarce governmental funds towards unsustainable development. The sensitivity tests were employed in the current study to evaluate the reliability of previous findings, especially how measurement errors and data quality would impact the reliability of Coronavirus

Disease 2019 (COVID-19) analysis outcomes. The tests were essential to ensuring that policy decisions were grounded in robust and accurate data (Yoon & Kim, 2022). Accordingly, the years 2020, 2021, and 2022 were excluded from the analysis. Table 4 illustrates the threshold estimation analysis, and the results indicate that the single-threshold test contains a threshold estimate of 1.2381 at a 5% significance level, with the single-threshold model significant by attaining a bootstrap p-value of 0.0024. The GDE below the threshold value or in the first regime was also negative (- 0.0921) and significant at a 1% significance level, whereas the GDE value above the threshold was insignificant at all significance levels. The results were aligned with the previous estimation and suggested that the findings were robust without being influenced by simultaneity bias.

Table 4: Sensitivity Analysis

Variable	Coefficient	Standard Deviation	T-Statistic	p-value
Governmental Expenditure	0.0451	0.1124	0.4012	0.4701
Inflation	- 0.0059	0.0041	- 1.4390	0.0021
Export	0.4581	0.1374	3.3340	0.0056
Consumption Expenditure	0.0814	0.0524	1.5534	0.0564
Foreign Direct Investment	0.0215	0.0201	1.0695	0.0010
Threshold Estimate		1.2381		
Below	- 0.0921	0.0420	- 2.1928	0.0001
Upper	- 0.0085	0.0356	- 0.2387	0.2098
R-squared		0.6587		
F-test		15.8017		
p-value		0.0000		
Bootstrap p-value		0.0024		
Number of Bootstrap Replications		300		

The intricate linkage between GDE and economic growth among ASEAN nations was delineated through the current findings, which discovered a critical threshold at 1.2696% of GDP. Governmental spending below the threshold would produce a detrimental impact on economic growth owing to ineffective resource allocation and substandard execution, which led to diminishing returns when governmental spending above the threshold would not result in further economic advantages. Thus, prudent fiscal planning is imperative and policymakers should stipulate the appropriate expenditure level and guarantee that allocated budgets are efficiently employed through robust governance and high-quality institutions. Governments should also strive to maintain developmental spending equivalent to or above the threshold to prevent the potential detrimental impacts of underfunding or overspending. Simultaneously, the efficiency of government spending should be elevated by allocating funds to high-impact industries, maintaining openness, and encouraging responsibilities in fund administration. Afonso et al. (2008) also elucidated the significance of financial accountability in governmental policy, efficient resource allocation, and robust governance to optimise the economic advantages of public spending. The current results challenged the general belief that higher

public spending would lead to enhanced economic development and highlighted the necessity of a focused and planned approach to governmental spending. The findings also significantly contributed to the existing knowledge corpus on fiscal policy by demonstrating that institutional strength, governance quality, and economic structure collectively impacted the effectiveness of governmental spending. Accordingly, ASEAN nations should concentrate on targeted interventions in facilitating more effective spending, performing investments in sectors with the highest returns, and ensuring that public expenditures could drive long-term and sustainable economic growth (Kamisan et al., 2024; Zulkifli et al., 2022).

5.0 Conclusion

The analysis of GDE across ASEAN countries demonstrated a complex relationship with economic growth and identified a crucial threshold of 1.2696. Spending below the threshold would lead to significant sluggish economic growth, whereas spending above the threshold could only offer a slight boost. The results underscored the importance of a balanced public spending approach and the effectiveness of government spending depended not only on the amount but also the quality. Policymakers are required to ensure that GDE remains at or exceeds the identified threshold annually to mitigate the harmful outcomes of underspending. Similarly, policymakers should maximise the benefits of public investments by prioritising key sectors for transformative impacts while strengthening transparency, accountability, and resource management. Hence, a more targeted approach is vital to guarantee that GDE surpasses the threshold among ASEAN countries to alleviate the risks associated with underspending. In addition, governmental budgets should primarily be allocated to infrastructure, education, and technology for higher returns and impacts, with efficient project management and high accountability aiding in optimising developmental spending. Developing performance-based budgeting and conducting regularly scheduled reviews of spending plans can also assist in selecting projects with the highest economic impact. Meanwhile, several study limitations exist as the results are specific to ASEAN nations and might not be generalisable to other regions with different economic and fiscal policies. Additionally, only data from a particular period were analysed, which might neglect the shifts in fiscal policy or external economic factors that could influence the association between governmental spending and economic growth. The threshold model also did not account for other factors, including political stability or institutional quality, which could determine the effectiveness of governmental spending. Future researchers can expand the current findings by exploring other interactions among different variables and the long-term dynamics between GDE and economic growth.

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Digital Skill Proficiency and Data Analytical Usage among Public-Sector Internal Auditors of the Accountant General's Department of Malaysia: Advancing Audit Digitalisation

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Abstract

Purpose: The current study aims to explore the level of digital skill proficiency among public-sector internal auditors of the Accountant General's Department (AGD) of Malaysia and examine the degree of data analytical usage among the auditors.

Method/ Design/ Approach: An online survey questionnaire was employed to gather data from a population of 124 public-sector internal auditors from the Internal Audit Management Division (BPAD) of the AGD Malaysia. Descriptive statistics, including mean scores, standard deviation, and mean score ranking, were utilised to determine the level of digital skill proficiency and data analytical usage. In addition, a focus group discussion was conducted with AGD officers to support the statistical findings.

Findings: The results revealed that public-sector internal auditors averagely possessed moderate levels of digital skill proficiency, with limited data analytics types. Microsoft Excel was the most extensively employed software among the auditors.

Originality: The empirical findings contributed novel insights into the current levels of digital skill proficiency and data analytical usage, which served as a valuable foundation for developing targeted strategies to advance the digital audit transformation agenda.

Keywords: Digital skills, data analytics, proficiency, public sector, auditors

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1.0 Introduction

Technological advancements, such as artificial intelligence (AI), robotic process automation (RPA), data analytics, and cloud computing, have significantly revolutionised the traditional auditing processes (Huang & Vasaehelyi, 2019; Otia & Bracci, 2022). Leading global accounting firms, including Deloitte, Ernst and Young, KPMG, and PwC, have performed significant investments in technological advancements to enhance efficiency and effectiveness (McGowan, 2023). Simultaneously, automation tools can facilitate the automation of monotonous tasks, which allows auditors to focus more on more complex activities, such as strategic analysis and risk assessment (Kelly, 2020; Moffitt et al., 2018; Tiberius & Hirth, 2019). Relevant AI-powered instruments and advanced data analytical techniques can also analyse large data volumes efficiently and accurately to identify patterns and anomalies previously undetected through manual audit processes (Huang & Vasaehelyi, 2019; Kokina & Davenport, 2017; Otia & Bracci, 2022). Moreover, the adoption of cloud computing improves flexibility and responsiveness by enabling real-time data access and remote collaboration (Alles & Gray, 2016; Garg et al., 2020; Otia & Bracci, 2022). Collectively, the aforementioned technological advancements necessitate auditors to continuously adapt and upskill to effectively leverage the technologies (ACCA, 2020).

Malaysia has actively been pursuing digital transformations since the establishment of the Multimedia Super Corridor (MSC) in 1996, which has acted as the foundation for subsequent developments in digital technology and infrastructure. The Malaysia Digital Economy Blueprint (MyDIGITAL) introduced in 2021 is a key example of the governmental commitment to accelerating national progress towards a digitally driven and high-income nation by 2030. The government has emphasised digital transformation as a significant driver of revolutionising the operations and service delivery of public-sector organisations. Furthermore, conventional auditing processes are becoming insufficient when more contemporary processes and systems are increasingly digitalised, which poses a considerable concern, especially for internal auditing in evaluating organisational performance (Pizzi et al., 2021). The BPAD is responsible for internal audits on public-sector entities, with a primary focus on financial and compliance audits. Accordingly, BPAD auditors should keep abreast with the latest technological advancements to ensure transparency, integrity, and high service quality among governmental agencies when allocating and utilising public funds. Thoroughly understanding the current level of digital skill proficiency and data analytical usage among BPAD internal auditors is imperative to guarantee that the auditors are adequately equipped with the necessary skills and can effectively utilise available data analytical techniques and tools. Low digital skill proficiency may hinder the auditors' preparedness to swiftly adapt to a data-driven audit environment (Ismail et al., 2024). Taib et al. (2023) also emphasised the importance of addressing competency gaps to improve the effectiveness of digitalisation.

The current study seeks to explore the level of digital skill proficiency and assess the degree of data analytical usage among BPAD internal auditors. The study would contribute significant insights and advance the existing knowledge corpus on digital audit transformation by elevating the understanding of how public sector auditors could adapt to the evolving digital landscape. Specifically, the findings would offer valuable insights for developing targeted capacity-building initiatives and enable authorities to design structured training programmes to effectively bridge digital skill gaps. Furthermore, the present study could support audit institutions in optimising digital strategies to enhance audit efficiency, strengthen fraud detection, and improve risk

assessment in public-sector audits. The results could also indicate the preparedness level of public-sector auditors to embrace and adapt to the digital future. The following section delineates the study background and literature review, followed by the employed methodology, findings and discussions, and the section on implications, limitations and future directions.

2.0 Background and Literature Review

2.1 Development and the Current Status of Digital Audit Implementation

The AGD Malaysia has pledged commitments towards the Malaysian governmental digital transformation agenda and materialising the MyDIGITAL initiatives through the establishment of the ICT Strategic Plan (2019–2023). The top management of the AGD has consistently elucidated the future directions towards higher digitalisation of the work processes, especially the BPAD. The division under the AGD initiated the digitalisation journey in 2018 by developing an integrated audit system, namely the Integrated Audit Report and Feedback Management System (iAREF). The system was fully activated on September 9, 2022, and the BPAD further reinforced the implementation of digital audits during the coronavirus disease (COVID-19) pandemic in 2020 as physical audit processes were unfeasible owing to the restrictions imposed by the movement control order (MCO) by utilising available digital resources and technological capabilities. Nonetheless, the iAREF is not integrated with other systems as the system only consolidates all audit engagement working papers for preparing the audit report. The system manages the entire process from the letter of intent to execute the audit work to reporting and monitoring. The iAREF encompasses a self-assessment *(penilaian kendiri)* audit, which is highly recommended in the standards stipulated by the International Organisation of Supreme Audit Institutions (INTOSAI) (2023). Currently, the system is undergoing a maintenance phase for one year. The development of the iAREF highlights the AGD commitment, particularly from the BPAD, to incorporate digital aspects into daily operational processes.

The BPAD management has implemented various initiatives to generate higher awareness among auditors regarding digital audit implementation and improve the auditors' competencies in employing digital tools for audit work. In addition to Microsoft Excel, the BPAD has invested in a specialised audit analytics tool recognised as Audit Command Language (ACL), which can analyse data for the entire population and identify anomalies or red flags that indicate potential risk areas. Contemporarily, the division comprises a permanent staff member who is well-versed in ACL. The assistance from the ACL vendor, scripts, or instructions for the financial statement items, namely Liability, Equity, Expenditure, Asset, and Revenue (LEBAH) have also been developed. The ACL output will be manually transferred to the iAREF for reporting and monitoring purposes. Nevertheless, ACL operates only within the governmental accounting system, namely the Integrated Government Financial Management Accounting System (iGFMAS), with the limitation in extracting data from sources other than iGFMAS. The limitation has prompted the department to explore more advanced audit analytical tools, in which the potential adoption of the Python programming language has been agreed upon in 2020 Business Strategy Planning (BSP) by the BPAD. A working paper has been prepared by a team in the BPAD and approval has been received from the Trust Fund unit in 2022 before the procurement process for the Python programming language has been initiated in late 2023.

2.2 Literature Review on Digital Skill Proficiency and Data Analytical Usage

A digitalised business environment significantly impacts audit practices and auditors' daily tasks (Betti & Sarens, 2021; Felski, 2023; Ferreira et al., 2021). Transitioning to digital audits necessitates auditors to possess adequate digital or information technology (IT) skills in terms of relevant applications, tools, and techniques (ACCA, 2020; Muro, 2017; Otia & Bracci, 2022; Taib et al., 2023). Digital skills, competencies, or literacy refer to the capability to effectively utilise digital tools and technologies, which encompasses proficiencies related to computers, software applications, the internet, and other digital resources (Barac et al., 2021; Ifada & Komara, 2023; Lutfi et al., 2023; Tsiligiris & Bowyer, 2021). Auditors are also required to be proficient in data analytical tools, familiar with automated auditing software, and skilled in cybersecurity practices to protect sensitive financial data when cybersecurity has become an increasingly critical aspect of digital audit and financial transactions are contemporarily more vulnerable to cyber threats and data breaches (Haapamäki & Sihvonen, 2019; Slapničar et al., 2022). The growing risk requires auditors to be well-versed in technology risk management (KPMG, 2024). Additionally, thoroughly comprehending cloud computing for storing and accessing audit data and employing advanced Excel functions for data manipulation are essential digital skills in modern auditing (Bahador & Haider, 2013; Pilos, 2020; Richardson et al., 2023). The skills are vital to auditors to efficiently perform tasks (Al-Okaily et al., 2020; Alqudah et al., 2020; Aryanti & Adhariani, 2020; Holmes & Douglass, 2022; Vitali & Giuliani, 2024).

Data analytics is increasingly integral to digital audits and is highly related to digital skills (Pilos, 2020), which involves identifying business questions and challenges that can be addressed through data analysis (Richardson et al., 2023). Data analytics is pivotal to enabling effective data processing, which can be transformed into valuable insights imperative to informed decisions, supporting corporate processes, and improving customer experience (Gandomi & Haider, 2015; Gartner, 2024). Moreover, data analytical tools, such as ACL and Python programming, have allowed auditors to conduct more thorough, accurate, and efficient audits (Betti & Sarens, 2021; Felski, 2023). The application of big data and data analytics has also produced numerous benefits in the public sector, including enhancing the quality of audit engagements through clearer and more comprehensible insights into public-sector entities and allowing for data testing of the entire population (Earley, 2015). Data analytics also facilitates the process of identifying emerging trends and anomalies, supports risk assessment, and aids in fraud detection, which can enhance governmental accountability and transparency in public-sector auditing (Kelly, 2020; Lazarevska et al., 2022).

Data analytical usage can be categorised into four general types, namely descriptive, diagnostic, predictive, and prescriptive (Barr-Pulliam et al., 2022; Richardson et al., 2023; Sigma, 2021). Descriptive analysis is performed to understand the environment by graphically presenting data insights via charts and graphs for more comprehensible information. Diagnostic analysis assists in data comparison to thoroughly understand causes and correlations while offering deeper insights into the causes of certain occurrences. Predictive analytics aids in forecasting future trends by incorporating advanced statistical models and machine learning algorithms. For example, integrating audit automation within departments can foster proactive audit approaches and elevate the efficiency and accuracy of audits (Kuenkaikaew & Vasarhelyi, 2013; Richardson et al., 2023). Prescriptive analytics can assist in determining the most appropriate direction for the future, although the analytical method is the most complex form of performing predictions to recommend specific actions (Richardson et al., 2023). The approach requires

auditors to guide respective teams based on data-driven insights and optimise decision-making processes (Sigma, 2021). Each type yields distinct outcomes and uniquely contributes to data-driven strategies and operational improvements.

Data mastering or extraction, transformation, and loading (ETL) encapsulates preparing data for analysis through a series of processes (Richardson et al., 2023). Data must be identified and corrected for errors, missing information, and duplicates before data can be loaded into a specific instrument (Chu et al., 2015). Cleaning and preparing datasets for analysis is one of the most challenging aspects of data analytics (Krishnan et al., 2016). According to the definition of Google Cloud, ETL is the end-to-end process by which a company manages and transforms structured and unstructured data into useful datasets for business purposes (Google Cloud, 2024). Meanwhile, data visualisation, which is performed after the completion of audit work, aids auditors in gaining valuable insights, reaching accurate conclusions, and improving the audit process by transforming data into visual representations and effectively combining information from different dimensions (Alawadhi, 2015; Mauludina et al., 2024; Xing et al., 2020). Nevertheless, a literature gap regarding the current level of auditors' digital skill proficiencies remains, especially in the public sector, despite the significance of digital skills among auditors. Limited research was conducted on the actual extent of data analytical tools and types utilised by auditors in accomplishing audit tasks.

3.0 Methodology

The present employed two (2) methods, namely an online survey questionnaire and a focus group discussion, for data collection. A survey questionnaire was developed based on instruments derived from prior scholars (Bahador & Haider, 2013; Barr-Pulliam et al., 2022; Richardson et al., 2023), with several additional questions included to effectively accomplish the study objectives. The questionnaire comprises two (2) sections, with Section A focusing on respondents' demographic profiles and Section B appraising digital skill proficiency, data mastering and visualisation skills, and the usage of data analytics types and tools. The researchers utilised Google Forms, which was an online survey administration tool, to administer the survey questionnaire to efficiently and effectively collect, store, and visualise data. The Google Form was also cost-effective (Nayak & Narayan, 2019). The questionnaire was pre-tested to assess the comprehensibility of the questions among the top management and accounting lecturers of the BPAD. The survey respondents were 124 internal auditors from the BPAD, with the high response rate obtained through the effective collaborative effort between researchers and the appointed BPAD staff to disseminate the survey to auditors. The data collected from the survey were analysed through the SPSS statistical package. Specifically, the descriptive statistics of the mean score, standard deviation, and mean score ranking were analysed to quantitatively summarise the results. The SPSS statistical package was selected due to the user-friendly interface, robust statistical capabilities, and widespread acceptance among academic and professional researchers. The focus group discussion with four (4) top management members of the BPAD was conducted to support the findings from the survey questionnaire. The session lasted for three (3) hours and was attended by the Deputy Director of the Special Auditing Section, Deputy Director of the Operation Section, Deputy Director of the Asset and Inventory Accounting Compliance Unit, and Chief Assistant Director of the Quality Control and Risk Management Unit. The interview transcript was analysed via thematic analysis, with relevant quotes extracted to provide insights into auditors' digital skill proficiency and data analytical usage.

4.0 Results and Discussion

4.1 Respondents' Demographic Profiles

Table 1 depicts respondents' demographic profiles, wherein the majority are females and the largest age group is between 31 and 40 years old. Most respondents possessed either an Sijil Tinggi Persekolahan Malaysia (STPM) or Diploma or a Bachelor's degree. Above half of the respondents were assistant accountants, followed by 33% as accountants in various positions. A majority were employed for 11 to 15 years, followed by employed for 16 to 20 years. More than one-third of the respondents possessed experience working with audit-related work in the private sector before joining the public sector. Specifically, the majority with private-sector experience possessed below five (5) years of working experience.

Table 1: Respondents' Demographic Profile

Category	Description	Frequency	Percentage (%)
Gender	Female	91	73.4
	Male	33	26.6
	Total	**124**	**100.0**
Age (years old)	20-30	7	5.6
	31-40	58	46.8
	41-50	51	41.1
	51-60	8	6.5
	Total	**124**	**100.0**
Educational Level	STPM / Diploma	58	46.7
	Bachelor's Degree	56	45.2
	Master's Degree	5	4.0
	Professional Qualification	4	3.2
	Others	1	0.8
	Total	**124**	**100.0**
Current Position in the AGD	Deputy Director	3	2.4
	Chief Assistant Senior Director	6	4.8
	Chief Assistant Director	4	3.2
	Senior Assistant Director	10	8.1
	Assistant Director	18	14.5
	Assistant Accountant	76	61.3
	Others	7	5.6
	Total	**124**	**100.0**
Employment Years as a Government Officer	1-5	15	12.1
	6-10	8	6.5
	11-15	44	35.5
	16-20	43	34.7
	Over 20	14	11.3
	Total	**124**	**100.0**

Table 1: Respondents' Demographic Profile (continued)

Category	Description	Frequency	Percentage (%)
Years of Experience in the Private Sector Related to Audit Work	No experience	77	62.1
	Less than 1 year	20	16.1
	1-5	21	16.9
	6-10	5	4.0
	11-15	1	0.8
	Total	**124**	**100.0**
Years of Experience in the Public Sector Related to Audit Work	Less than 1 year	19	15.3
	1-5	58	46.8
	6-10	27	21.8
	11-15	9	7.3
	16-20	8	6.5
	Over 20	3	2.4
	Total	**124**	**100.0**

4.2 Digital Skill Proficiency Level

The respondents were asked to indicate the perceived proficiency degree in 11 digital skills on a five-point Likert scale ranging from 1 as very low proficiency to 5 as very high proficiency. Table 2 illustrates the mean scores, standard deviations, and mean score ranking for each of the digital skills measured. The mean scores ranged from 2.83 to 3.19, which posited that auditors were moderately proficient in the digital skills. The top three (3) digital skills acquired by auditors were spreadsheet software (mean = 3.19), presentation software (mean = 3.18), and advanced word processing for report preparation (mean = 3.13). The applications proficiently employed by auditors in Microsoft Office Excel, Word, and PowerPoint, which were considered one of the most crucial professional skills for future auditors (Aryanti & Adhariani, 2020; Uyar & Gungormus, 2011). Spreadsheet software, including Microsoft Excel, was utilised by BPAD auditors for data analysis as the software enabled auditors to audit the entire population. Presentation software, including Microsoft PowerPoint, was also commonly utilised for seminars, workshops, and training presentations. Furthermore, advanced word processing was widely employed for reporting audit findings and writing audit reports. The widespread usage of Microsoft Office applications in governmental administration was also discerned by Ahmi et al. (2016), who discovered a vast majority of auditors in the Internal Audit Unit (IAU) employed the applications for audit works. The extensive usage of the applications among BPAD auditors could also be attributed to the extensive availability as the AGD subscribed to Microsoft Office 365. Comparatively, the three lowest digital skills acquired by auditors were workflow automation and business process reengineering, record life cycle management, and database operations. The skills were integral to digital transformation and low proficiency propounded that the auditors were unprepared for the digital transformation. The BPAD is currently in the initial phase of fully digitalising audit processes, which might explain why the skills are a lower priority contemporarily. In addition, the low ranking of workflow automation and business process reengineering skills could be owing to organisational change resistance. Implementing the skills requires significant shifts in established audit workflows that challenge traditional processes and roles.

Table 2: Digital Skill Proficiency Levels among Auditors

Digital Skills	Mean	Standard Deviation	Rank
Spreadsheet software	3.19	0.85	1
Presentation software	3.18	0.89	2
Advanced Word document for report preparation	3.13	0.85	3
Information search and retrieval techniques	3.06	0.82	4
IT governance (resource management, risk management, performance management, value delivery, and strategic alignment)	2.98	0.95	5
IT security (antivirus system, firewall, backup, and recovery)	2.98	0.93	6
Data analysis, reporting, querying, and business intelligence	2.91	0.94	7
Data auditing (audit trail, fraud control, and others)	2.91	0.91	8
Database operations (data creation, manipulation, management, coding, dictionary, control, extraction, and warehouse)	2.90	0.92	9
Record lifecycle management (creation exchange, storage retrieval, and retirement or deletion)	2.85	0.93	10
Workflow automation and business process reengineering	2.83	0.91	11

4.3 The Degree of Data Mastering and Visualisation Skill Proficiency

Data management, cleansing, and correcting skills are considered crucial by the auditing industry (Holmes & Douglass, 2022). Specifically, respondents were asked to indicate the proficiency level in four (4) key areas, namely data extraction, data loading, data transformation or cleaning, and data visualisation through a five-point Likert scale to assess respondents' proficiency in data mastering and visualisation skills. Table 3 depicts the mean scores range from 2.8 to 2.92, which posits moderate proficiency. Particularly, data extraction was employed the most while data visualisation was the least utilised among auditors based on mean score ranking. Preparing datasets for analysis was also one of the highest challenges in data analytics due to the complex processes (Krishnan et al., 2016). The initial step in preparing data for analysis was data extraction in the ETL process, followed by data transformation and loading (Richardson et al., 2023). Hence, data extraction was the highest-ranked skill among the auditors as extracting data from the iGFMAS enabled auditors to automatically execute scripted analyses and pinpoint any potential anomalies or red flags within the dataset. The data cleaning process was performed after the data were extracted from the iGFMAS. The dataset was examined and corrected for incorrect values, missing data, and duplicates before being loaded into the selected tools, namely either Microsoft Excel or ACL:

> "ACL operates within the raw data of iGFMAS… ACL mainly deals with raw data, totally raw data, tables, and tables within iGFMAS. It extracts data from various tables and performs analyses." (M4)

The data visualisation skill was ranked last. Data visualisation involves transforming data into visual representations that can effectively amalgamate information from various dimensions (Xing et al., 2020) while facilitating cognitive processes, especially in a big data environment, to assist auditors in increasing vigilance and efficiency (Mauludina et al., 2024). The last rank of

the digital skill among auditors postulated that data visualisation was employed less frequently compared to other data mastering skills. A systematic review conducted by Mauludina et al. (2024) highlighted the limited application of data visualisation in auditing despite the potential to improve audit quality.

Table 3: Data Mastering and Visualisation Skill Proficiency among Auditors

Data Mastering and Visualisation Skills	Mean	Standard Deviation	Rank
Data extraction	2.92	0.98	1
Data loading	2.85	1.07	2
Data transformation or cleaning	2.85	1.00	3
Data visualisation	2.80	0.98	4

4.4 Usage of Data Analytics Types and Tools

Data analytics is one of the digital auditing components (Pilos, 2020). The current study assessed the level of data analytics usage among auditors in two (2) aspects, namely (1) data analytics types and (2) data analytical tools, on a five-point Likert scale ranging from 1 as not at all to 5 as very extensive. Table 4 demonstrates that the mean score for each types ranges from 2.78 to 2.82, which posits that the auditors employ the data analytics types moderately. The mean score rankings indicated that predictive and descriptive analytics were the most commonly employed types. This finding aligned with the ongoing efforts of the BPAD to digitalise audit processes and reflect broader trends in the auditing field. Kuenkaikaew and Vasarhelyi (2013) underscored that audit automation facilitated more proactive and predictive auditing, which enabled auditors to detect anomalies and assess risks in real time. Descriptive analytics, which involves summarising and visualising audit data through graphs, charts, and dashboards, remains fundamental in audit analytics. The types is straightforward and highly comprehensible, particularly for junior auditors who may not possess extensive experience with more advanced types. Conversely, prescriptive analytics was the least utilised data analytics types among internal auditors, which required auditors to not only perform predictions but also recommend actionable solutions. Therefore, the auditing process is inherently intricate (Sigma, 2021). Furthermore, the involvement of top management is integral to strategic decisions. The high adoption rate of data analytics types among the respondents, in which approximately 70% were assistant auditors, suggested a high focus on data representation instead of strategic decision-making. Table 5 also portrays that only Microsoft Excel is extensively employed by auditors, whereas other data analytical tools, particularly ACL, Microsoft Power BI, and Tableau, are moderately utilised. Summarily, the results highlighted the evolving role of data analytics in auditing processes. While predictive and descriptive analytics are more prevalent due to accessibility and practical benefits, prescriptive analytics requires further institutional support and capability development to achieve widespread adoption in the audit profession.

Table 4: Usage of Data Analytics Types among Auditors

Data Analytics Types	Mean	Standard Deviation	Rank
Predictive	2.82	0.991	1
Descriptive	2.82	0.991	2
Diagnostic	2.81	0.985	3
Prescriptive	2.78	0.992	4

Table 5: Usage of Data Analytical Tools

Data Analytics Tools	Mean	Standard Deviation	Rank
Microsoft Excel	3.62	0.850	1
ACL	2.61	1.167	2
Microsoft Power BI	2.32	1.159	3
Tableau	2.23	1.155	4

The extensive usage of Microsoft Excel could be owing to the substantial training provided by the BPAD to auditors:

> "In BPAD, a few years back, we started training our auditors with the basics, using Excel, and advanced Excel – everything related to Excel. This served as a stepping stone for us to move to the next level. We learned how to analyse data using Excel, which is semi-automatic and manual. Once we understood Excel, we could progress to other tools." (M4)

The predominant role of ACL as the primary audit tool in the BPAD explained the second rank, which allowed auditors to plan and complete more thorough, accurate, and efficient audits (Felski, 2023):

> "As for the audit tools, we are using ACL. We have experts in ACL, whom to construct scripts for components… We also have appointed a vendor to assist us in building ACL scripts." (M3)

Microsoft Power BI and Tableau garnered low rankings due to the limited suitability for auditing purposes:

> "Power BI is good, but for auditing, ACL is still better. ACL specialises in auditing…. Tableau's visualisation dashboard is attractive, but when it comes to auditing, ACL has its own strengths…Furthermore, Tableau is expensive, though it's the best. However, due to the high cost, we had to pull the handbrake." (M4)

In addition, both Microsoft Power BI and Tableau were utilised for data visualisation. The low usage was partially consistent with previous findings that auditors were discovered to possess the least proficiency in data visualisation.

5.0 Implications, Limitations, Recommendations for Future Research and Conclusion

Public-sector auditors should develop digital proficiency and data analytical skills to resolve current challenges as digital transformation in auditing becomes increasingly necessary to the national commitment to embracing digitalisation. The findings revealed that BPAD auditors were moderately proficient in digital skills and data analytics types were moderately utilised. While Microsoft Excel was extensively employed, other tools were moderately utilised. In addition, the results corroborated that a successful digital audit implementation required auditors to enhance the proficiency degree in data analytical skills and types. Hence, the BPAD should consider developing training modules with an extensive coverage of IT and digital skills, including database operations and data analytics. Regular training and workshops related to digital audit could also be offered both internally and externally to auditors. Furthermore, trainers' sharing sessions and training programmes could motivate the immediate application of the knowledge and skills acquired from the workshops. One feasible approach is micro-credentialing, wherein auditors can complete short and specialised courses focusing on specific data analytical tools and types. The modular programmes allow for flexible and self-paced learning, which enables auditors to upskill without disrupting existing work commitments. Another approach is professional certification programmes, such as Data Analytics for Auditors certification, which can offer auditors industry-recognised credentials and improve auditing competencies and credibility. While the results uncovered that auditors accomplished significant progress in the necessary groundwork within respective jobs to structure the digital audit within the department, low proficiency levels were discovered in data mastering and visualisation skills and data analytics types. Auditors should consider acquiring alternative skills in AI and ML to be capable of performing prescriptive analysis based on a model developed through predictive analytics, which is beyond descriptive and diagnostic analytics. Acquiring alternative skills could also assist the auditors in becoming valuable contributors to strategic decision-making, especially when most audit work in the BPAD relies on the ACL software. Therefore, ensuring that more staff are fully trained and competent is pivotal.

The current study contains several limitations despite the significance of the findings. Specifically, this study collected data on self-reported proficiency levels, which might introduce response bias due to over- or underestimation of skills by respondents. Auditors might perceive personal digital capabilities differently based on personal confidence levels or prior exposure to training, which could impact the accuracy of the findings. The present study also focused only on the BPAD auditors of the AGD. Involving auditors from the National Audit Department (NAD) of Malaysia is also vital to thoroughly understanding public-sector auditors' digital proficiency and usage levels of data analytical instruments as the NAD is also the primary entity responsible for auditing all other public-sector entities. Future scholars can also consider comparing both BPAD and NAD on various implementation aspects and identifying the potential synergistic collaborations between the two (2) entities to improve auditors' digital proficiency and achieve optimal usage of data analytics. Furthermore, future academicians can adopt a longitudinal approach to assess improvements in auditors' digital skills in the long term or incorporate inferential statistical analysis to scrutinise the relationships between auditors' digital proficiency and the adoption rate of data analytics. Employing techniques, such as regression analysis or structural equation modelling, can offer deeper insights into the factors contributing to data analytical usage. Summarily, the empirical evidence from this study could support attaining the primary objective of accelerating the digital transformation agenda of the government through digital audit technological advancements.

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