IPN Journal of Research and Practice in Public Sector Accounting and Management
Vol. 15, No. 1, 2025, pp. 25 - 55

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

Zaira Aniza Samsudin, Azwadi Ali*

Faculty of Business, Economics and Social Development, Universiti Malaysia Terengganu, Kuala Nerus, Terengganu, Malaysia

**Corresponding Author: azwadi@umt.edu.my*

https://doi.org/10.58458/ipnj.v15.01.02.0111

Received: 30 October 2024 *Reviewed: 5 March 2025* *Accepted: 17 April 2025* *Published: 26 June 2025*

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

This article is part of a research on Artificial Intelligence in Public Sector Accounting: Opportunities and Challenges to Improve Service Delivery and Quality of Financial Reporting supported by the Accountant General's Department of Malaysia through *Geran Penyelidikan Perakaunan dan Kewangan Sektor Awam Tahun 2024* (JANM.100-12/2/1 (15)).

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.

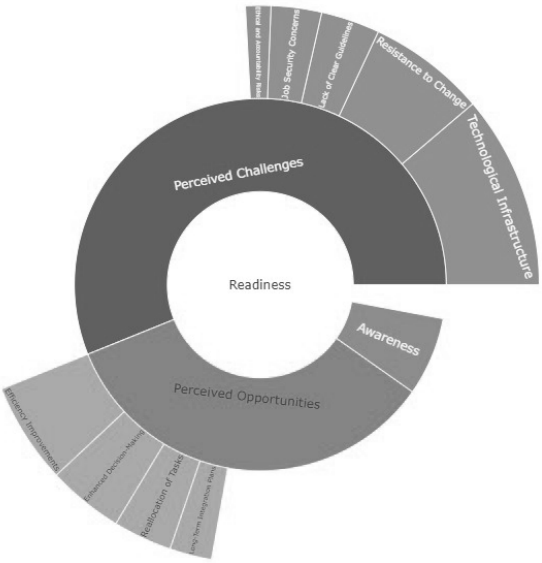

Figure 1: Thematic Structure of AI Readiness

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.

Acknowledgement

The completion of this study is indebted to the Accountant General's Department of Malaysia for their financial support, the invaluable participation of public sector accountants in the study, and the encouragement and resources provided by Universiti Malaysia Terengganu.

References

Abisheganaden, J., Lee, K. H., Low, L. L., Shum, E., Goh, H. L., Ang, C. G. L., Ta, A. W. A., & Miller, S. (2023). Lessons learned from the hospital to home community care program in Singapore and the supporting AI multiple readmissions prediction model. *Health Care Science, 2*(3), 153–163. https://doi.org/10.1002/hcs2.44

Ahn, M. J., & Chen, Y. C. (2022). Digital transformation toward AI-augmented public administration: The perception of government employees and the willingness to use AI in government. *Government Information Quarterly, 39*(2), 1–14. https://doi.org/10.1016/j.giq.2021.101664

Bannister, F., & Connolly, R. (2020). The future ain't what it used to be: Fore casting the impact of ICTs on public sector accounting. *Government Information Quarterly, 37*(1), 101–107. https://doi.org/10.1016/j.giq.2019.101410

Bracci, E. (2022). The loopholes of algorithmic public services: an "intelligent" accountability research agenda. *Accounting Auditing & Accountability Journal, 36*(2), 739–763. https://doi.org/10.1108/aaaj-06-2022-5856

Bradley, C., Carrigan, J., Dandona, G.S. & Ungur, S. (2024). *Generative AI and the future of work in Australia*. McKinsey & Company. 2024(2), 1–59,

Brown, R., Davies, M., & Vance, A. (2020). The impact of artificial intelligence on the accounting profession. *Accounting Horizons, 34*(2), 485–503. http://dx.doi.org/10.5296/bms.v15i1.21620

Carlsson-Wall, M., Goretzki, L., Hofstedt, J., Kraus, K., & Nilsson, C. J. (2022). Exploring the implications of cloud-based enterprise resource planning systems for public sector management accountants. *Financial Accountability & Management, 38*(2), 177–201. https://doi.org/10.1111/faam.12300

Cifuentes-Faura, J. (2024). Debate: Will AI affect the transparency and accountability of public sector accounting? *Public Money & Management, 44*(2), 154–155. https://doi.org/10.1080/09540962.2023.2267305

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research de sign: Choosing amongst five approaches* (4th ed.). SAGE Publications.

Criado, J. I., Alcaide-Muñoz, L., & Liarte, I. (2023). Two decades of public sector innovation: Building an analytical framework from a systematic literature review of types, strategies, conditions, and results. *Public Management Review*, 1–30. https://doi.org/10.1080/14719037.2023.2254310

Dickney, G., Blanke, S., & Seaton, L. (2019). Machine learning in auditing current and future applications. *The CPA Journal, 89*(6), 16–21.

DTA. (2024). Our next steps for safe, responsible AI in government. Digital Transformation Agency, Australia. Accessed from https://www.dta.gov.au/news/our-next-steps-safe-responsible-ai-government

Fedyk, A., Hodson, J., Khimich, N., & Fedyk, T. (2022). Is artificial intelligence improving the audit process? *Review of Accounting Studies, 27*(3), 938–985. https://doi.org/10.1007/s11142-022-09697-x

Hankins, E., Nettel, P. F., Martinescu, L., Grau, G., & Rahim, S. (2023). *Government AI Readiness Index 2023*. Oxford Insights. 1–53.

ICSA. (2023). Artificial intelligence for the accountancy industry – What lies ahead: AI whitepaper. Institute of Singapore Chartered Accountants. Accessed from https://isca.org.sg/resource-library/digitalisation/artificial-intelligence-for-the-accountancy-industry---what-lies-ahead

Janssen, M., Hartog, M., Matheus, R., Yi Ding, A., & Jochen Z. (2020). Will algorithms blind people? The effect of explainable AI and decision-makers' experience on AI-supported decision-making in public administration. *Government Information Quarterly, 37*(3), 101–396. https://doi.org/10.1177/0894439320980118

Kindzeka, K. (2023). Impact of artificial intelligence on accounting, auditing and financial reporting. *American Journal of Computing and Engineering, 6*(1), 29–34. https://doi.org/10.47672/ajce.1433

Loukis, E., Maragoudakis, M., & Kyriakou, N. (2020). Artificial intelligence-based public sector data analytics for economic crisis policymaking. *Transforming Government People Process and Policy, 14*(4), 639–662. https://doi.org/10.1108/tg-11-2019-0113

Mat Hussin, N. A. K., Bukhari, N. A. N. M., Nor Hashim, N. H. A., Shaipul Bahari, S. N. A., & Mohd Ali, M. (2024). The impact of artificial intelligence on accounting profession: A concept paper. *Business Management and Strategy, 15*(1), 34–50. https://doi.org/10.5296/ bms.v15i1.21620

Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly, 36*(4), 101–123.https://doi.org/10.1016/j.giq.2019.06.002

Miles, M. B., Huberman, A. M., & Saldana, J. (2019). *Qualitative Data Analysis*. Sage Publications. Thousand Oaks.

NAIS. (2023). *Singapore National AI Strategy 2.0 - AI for the public good for Singapore and the World*. Government of the Republic of Singapore. Accessed from https://www.smartnation.gov.sg/nais/

O'Keeffe, W. (2023). *AI in the Australian Government: Applications, challenges, and the road ahead*. Accessed from https://ishango.io/ai-in-the-australian-government/

SAI2. (2023). *Compendium on Responsible Artificial Intelligence 2023*. Supreme Audit Institution of India. 1–106.

Saleh, Z., Isa, C. R., & Hasan, H. A. (2021). Issues and challenges in implementing International Public Sector Accounting Standards (IPSAS). *IPN Journal of Research and Practice in Public Sector Accounting and Management, 11*(1), 1–14. https://doi.org/10.58458/ipnj.v11.01.01.0067

Sterz, S., Baum, K., Biewer, S., Hermanns, H., Lauber-Rönsberg, A., Meinel, P., & Langer, M. (2024, June). On the quest for effectiveness in human oversight: Interdisciplinary perspectives. *In The 2024 ACM Conference on Fairness, Accountability, and Transparency* (pp. 2495–2507). ACM. https://doi.org/10.1145/3630106.3659051

van Noordt, C., & Misuraca, G. (2020). Exploratory insights on artificial intelligence for government in Europe. *Social Science Computer Review, 40*(2), 426–444. https://doi.org/10.1177/0894439320980449

Wael, A. H., Abdallah, W., Ghura, H., & Buallay, A. (2023). Factors influencing artificial intelligence adoption in the accounting profession: The case of public sector in Kuwait. *Competitiveness Review: An International Business Journal, 34*(1), 3–27. https://doi.org/10.1108/CR-09-2022-0137

Wirtz, B., Weyerer, J., & Geyer, C. (2018). Artificial intelligence and the public sector-Applications and challenges. *International Journal of Public Administration, 42*(7), 596-615. https://doi.org/10.1080/01900692.2018.1498103

Wirtz, B. W., Langer, P. F., & Fenner, C. (2021). Artificial intelligence in the public sector-A research agenda. *International Journal of Public Administration, 44*(13), 1103–1128. https://doi.org/10.1080/01900692.2021.1947319