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Assessment on Factors Affecting Asset Management Performance in Malaysian Government Agencies: A Concept Paper

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Abstract

Asset management is a "joined in" organisation activities to realise value from its controlled resource. Asset management evolved from simple maintenance, which was treated as a "necessary evil" in the 1970s, to the current position that is the core functions of organisational strategies. In Malaysia, the government is committed to enhancing asset management quality to ensure it is managed in a systematic, holistic, and sustainable manner; thus, policies and procedures regarding asset management have been issued since 1967. However, the Auditor- General Report found out that most government agencies are unable to manage their assets efficiently. This study focuses on analysing factors affecting asset management performance in government agencies in Malaysia. This study will look at the issues commonly raised by the Auditor-General Report, particularly on asset management, and identify the factors affecting asset management performance. The conceptual part consists of an extensive search and analysis of secondary sources of information through references and reviews of academic articles, Auditor-General's Report, news, and publications related to asset management. The literature review's analysed data indicate that three issues can be underlined: ineffective maintenance practice, misused and theft of government assets, and inadequate asset management knowledge. Accordingly, to clarify the factors leading to the said problems, a conceptual structure has been proposed based on previous studies. The identified factors leading to asset management issues in the public sector are maintenance practice, asset misappropriation, and training policy. This study has also analysed the gaps in past studies regarding asset management research. This concept paper provides a valuable addition to the current knowledge base, particularly on how factors affecting asset management performance in government agencies and hindering the government from delivering an efficient service to the public. The implications and recommendations for future research are also discussed.

Keywords: Asset Management, Public Sector, Maintenance Practice, Assets Misappropriation, Training Policy

Introduction

Asset management (AM) is a strategic and integrated process involving various disciplines, such as engineering, operating, management, and maintenance, to gain the greatest benefit lifetime and the assets' returns (Amadi-Echendu et al., 2010; Laue et al., 2014). AM needs participation from different areas, primarily human activities, to manage individuals who control assets and incorporate asset-related policies in the operational and organisational frameworks, particularly asset maintenance (Nel & Jooste, 2016). The importance of AM has been discussed, developed, and taken into account for several decades. AM landscape is not considered a new discipline, but it is a part of its constant evolution (Amadi-Echendu et al., 2010; Wijnia, 2016).

Many countries have reformed their AM; the government of the United Kingdom, New Zealand, and Australia, were among the early countries that started to move into the formal management of physical assets (Naief, 2018). Similarly, the government of Malaysia is committed to review and enhance the quality of AM to ensure it is managed in a systematic, holistic, and sustainable manner because vast investment has been made in developing and building assets. The government provided assets to enhance its citizens' quality of life; thus, it is an essential instrument for the government in delivering services either directly or indirectly (GAMP, 2009).

However, the Auditor-General Report found out that most government agencies are unable to manage their asset efficiently. Wastefulness, extravagance, and mismanagement have been detected, indicating that the public money had not been wisely spent. Asset management performance is also ranked the lowest compared to other elements in the financial management accountability index for five consecutive years (2014–2018) except in 2016. It implies that AM performance in the public sector is weak compared to other elements audited. Al Marzooqi et al (2019) opine that improving AM performance is a complex process and influenced by several factors, including employees training, effective maintenance practice, and workplace culture

The government needs to manage the assets effectively to ensure the quality of public service delivery and increased public resources (Backer & Yusoff, 2015; Rasolonjatovo et al., 2015) to hinder government fund wastage. The wastage of government funding can happen because of ineffective AM and asset misappropriation (Haron et al., 2015).. According to the PwC report 2020, the internal fraud perpetrator, which is asset misappropriation fraud, is the second-highest serious or disruptive incident in Malaysia. Thus, the government needs to provide more training to their employees to increase public service quality (Elnaga & Imran, 2013) and promote ethical behaviours to safeguard government assets.

A study by Abdullah and Muhammad (2020) found that the government servant raised the issue of lack of training on AM by government agencies. The lack of training caused employees to have inadequate knowledge and skills in asset management and failed to comply with the loss procedure (Auditor General's Report, 2019). Mazlan and Mohammed (2008), and Backer and Yusoff (2015) suggest that government agencies should provide adequate training to their employees to enhance AM knowledge because training and development programmes play an important role in achieving AM strategies and goals (Kriege et al., 2016).

One of the AM objectives is to allow organisations to create, enhance, and/or sustain a resource with corporate governance values to ensure the AM paradigm shift much broader than the maintenance scope (Amadi-Echendu, 2004). Ensuring the infrastructure and equipment are in good condition is imperative. The improper maintenance has caused

recurring damage to government equipment (Auditor General's report, 2017); hence, affecting the service delivery.

Various issues of asset management have occurred in government agencies, such as ineffective maintenance practice, misused and theft of government assets, and inadequate knowledge of the AM procedure, affecting AM performance's effectiveness, efficiency, and economics in government agencies (Buang, 2011).

This study aims to explore and identify factors contributing to these issues that have been studied extensively by previous literature. The study's outcomes would then allow government agencies to take appropriate measures to improve AM performance because AM's effectiveness plays an increasingly important role in optimising government performance. This study is conducted by reviewing several articles and exploring some previous studies on asset management and the Auditors-General Report for 2014 to 2019.

Literature Review

Asset Management

Asset management can be defined as the "joined in" activities of an organisation to realise value from its controlled resource. The United States Department of Transport described AM as a comprehensive asset maintenance process, upgrading and operating with cost-effectiveness. In other words, AM can be seen as a combination of engineering fundamentals with organisational processes and economic theory.

AM comprises several processes of maintaining an asset's function to ensure it performs effectively and cost and risk control to accomplish the objectives and ensure service delivery by agencies (TAMM, 2009). Managing the asset allows an organisation to create, enhance, and sustain its business. The critical aspect of managing the assets is to maintain the asset so that its function remains. Schraven et al. (2011) indicate that establishing alignment between assets objectives, situation and intervention, the formulation of assets objectives, and managing multiple actors with different interests are the key challenges to achieve effective AM. The government need to develop sufficient AM policies (Hanis et al., 2010) to ensure AM effectiveness. Effective AM allows an organisation to increase the economic productivity (Sara et al., 2021) and allow the organisation to save money for long term (Mastroianni et al., 2021).

Generally, AM performance is influenced by adequate resources, employee competencies, acceptable practices, partnership with external service providers, and a supportive workplace environment. Ismail et al. (2019) found that employees' knowledge and internal control are essential to AM practices in a government department, while organisational culture and information systems did not influence AM practice. A good AM creates the best possible use of resources and customer support and efficiency, align with a balanced financial goal (Too, 2010). The achievement of good AM depends on the availability of appropriate, qualitative, and timely information on assets as well as extensive knowledge of asset managers (Hastings, 2015).

The focus of AM is on the efficient management of an asset's life cycle, from acquisition to use, maintenance, and disposal. The emphasis is not on the revenue it might create for an organisation but on results, risks, and costs to get the best solutions.

Overview of Asset Management Guidelines in Malaysia Public Sector

The government of Malaysia has issued several guidelines to ensure a systematic approach to AM and comprehensive asset procedure, as shown in Table 1. Effective AM

allows government agencies to deliver service efficiently as part of the NPM public sector reforms.

Table 1: List of Procedures and Circulars Issued by Government (Source: Buang, 2011)

Year	Procedure/Circular
1967	The Factories And Machinery Act outlined safety and health standards requirements in 1967.
1974	Rules were circulated for the maintenance of buildings, public roads, sewage systems, and the role and responsibilities of the Public Works Department.
1992	Guidelines For Total Quality Management In The Public Service.
1995	General Circular Letter No. 2 on the "Maintenance Management – Establishment of Planned Maintenance System" was issued to enhance the public sector's maintenance management system.
2007	Treasury Circular No. 5 provided guidelines for the management of moveable assets.
2009	General Circular No. 1 outlining the government's policy and principle on total asset management.

The government is committed to improving AM because it is used to measure the performance of the financial management of government agencies based on the financial management accountability index. The government has been actively taken the initiative to issue procedures about the AM since 2007 through Treasury Circular No 5/2007.

Previously there was no single guidelines or standard on the complete procedure regarding AM because guidelines on government AM are scattered in several separate documents, including Treasury Instructions (APS), Treasury Guidelines – Store Management Procedures (PP-TPS), Treasury Circulars (PP), Treasury Circulars (SPP) and General Circular. This situation causes employees unable to manage assets efficiently and timely because they need to refer to various procedures.

To strengthen the AM, the government had to launch the Government Asset Management Policy (GAMP) and Total Asset Management Manual (TAMM) in 2009. This first comprehensive AM policy outlined the direction, principles, and strategies for implementing AM that must be adhered to by every government agency. GAMP requires the asset to be managed in a comprehensive and integrated manner, including planning, creation, usage, maintenance, inspection, disposal, and write-off procedures to ensure that the assets are in good condition, safe to use, cost-effective, and long-lasting. There has been no other procedure on asset management in the public sector issued after 2009. Thus, the Ministry of Works has called for a review on the GAMP to determine whether all government assets are systematically, holistically, and sustainably managed (Kannan, 2018).

GAMP requires a comprehensive and efficient AM, including the preparation, development, usage, maintenance, review, disposal, and write-off procedures to ensure the assets were in good condition, safe and cost-effective to use. The AM policy, strategy, plan,

and objectives represent the AM system's planning environment and translate the goals and mission from its strategic plan. These are implemented in the government agencies through the AM lifecycle activities.

Related Literature and Research Gaps

Past literature on asset management was conducted from different dimensions. However, the studies' findings were inconsistent, and gaps were found in the studies, as shown in Table 2. In the context of Malaysia, studies on asset management are still low (Garramone et al., 2020). Most of the studies were conducted in developed countries, of which the factors may not apply to Malaysia. There has been very limited discussion on the impact of asset misappropriation on asset management as well. Moreover, none of the studies had looked into the relationships between maintenance practice, asset misappropriation, and training policy against the AM performance (Al Marzooqi et al., 2019; Ismail et al., 2019; Majid et al., 2014).

Table 2: Dimensions and gaps of studies on asset management performance

No	Author, Year	Dimensions	Gaps
1.	Kaganova and Amoils (2020)	a. Austerity measures b. Performance management c. Technology and business operations d. Environmental sustainability f. Political and ideological agendas	A study conducted in broad review and not measure specific aspects of asset management.
2.	Sanjaya and Utama (2020)	a. Organisational b. Information system c. Strategic planning d. Asset Optimisation	A study conducted in one district and the empirical test is undertaken only on the internal factor.
3.	Ismail et al. (2019)	a. Employees' Knowledge b. Internal Control c. Organisational Culture d. Information System	Lack of empirical study of the factors for effective asset management. Little discussion of the impact of internal control on asset misappropriations.
4.	Al Marzooqi et al. (2019)	a. Resource b. Employee Competency c. Practice d. Partnership e. Training f. Workplace Environment	A study conducted explicitly in a developed country; the results might be different in a developing country. The study only explored the factors required for managing assets within the utilisation stage and did not cover other lifecycle stages, such as planning, designing, acquisition, and disposal.

5.	Naief (2017)	a.External environment b. Internal environment c.Options formulation d.Options evaluation e.Programme formulation f. Portfolio alignment g.Implementation	The study using a qualitative approach and interviews with limited interviewees in a developed country. The result might not be generalised and be used in another country.
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Asset Management Performance

Performance measurement is a construct used by an organisation to measure the result of activities conducted. Performance can be regarded as a set of processes that enable interested parties to take effective action to develop a productive and efficient organisation in the future (Lebas & Euske, 2007). In order to take such actions, decision-making is based on reliable, valid, and relevant sources of information. Management is obsessed with performance, trying to measure every aspect of operation (Neely, 2007), resulting in an unnecessary focus on irrelevant processes. Even though organisations have been managing their assets, AM is becoming more challenging than in the previous decade because AM has evolved.

In a competitive landscape, it is important to manage assets effectively and efficiently to achieve optimal returns and gain competitive advantages. It cannot be done by only considering the assets' entire lifetime and all associated costs and maintenance; instead, AM should not be viewed as different concerns (Campbell & Reyes, 2014).

AM's performance is a construct used by the organisation to measure the organisation's outcomes from asset management activities conducted based on the concept of 3Es (economy, efficiency, and effectiveness) (Buang, 2011). Efficiency and effectiveness analysis is based on the relationships between the inputs, outputs, and outcomes. Mihaiu et al. (2010) stated that effectiveness is an indicator based on the outcomes' ratio achieved to the one configured. At the same time, efficiency is a measure obtained by disclosing the results of the efforts made. Public spending efficiency indicates a relationship between the economic and social consequences of introducing any activities and the effort made to fund them.

Factors Affecting Asset Management Performance

Maintenance Practice

Asset management involves systematic and coordinated activities and practices through which an organisation ideally and sustainably oversees its assets and asset systems (Alfatih et al., 2015). Jooste and Page (2004) asserted that the implementation of maintenance management results in sustainable assets. Thus, to ensure assets' sustainability, AM should seek to move away from traditional maintenance practices (Amadi-Echendu, 2004). Effective maintenance management may reduce the life cycle cost while ensuring the efficient use of the assets.

Maintenance practice can be defined as a set of activities or practices that includes inspections and identification of faults to oversees assets based on the maintenance

strategies: Predictive, Preventive, and Corrective (Ratnayake & Markeset, 2010). The Preventive Maintenance Strategy aims to evaluate a sequence of reviews, replacements, and part revisions with a fault rate frequency. Preventive maintenance addresses issues that occur due to the wear and tear of assets. It is performed before asset failure, decreases potential failure probability, and increases reliability.

On the other hand, predictive maintenance monitors the asset's efficiency to predict when maintenance will be carried out. This approach provides cost advantages for proactive maintenance and allows for easy scheduling of maintenance operations and eliminating unintended failures. It might be the most cost-effective maintenance solution (Kirubakaran & Ilangkumaran, 2016).

Corrective maintenance is undertaken when failures occur and view as a cost-saving strategy, which could cause serious harm to properties, infrastructure, people, and the environment (Fouladgar et al., 2012; Ratnayake & Markeset, 2010). The key advantage of corrective maintenance is that the activities are only carried out when the system is broken down.

The implementation of the types of maintenance chosen by the organisation influence the performance of AM. Nevertheless, it depends on the organisation's capability in regards to the policy, approach, human resources, and outsourcing strategies.

Asset Misappropriation

Asset misappropriation is a fraudulent act in which the perpetrator deceit to steal or misuse an organisation's resources. A particular asset of the organisation is taken to benefit the individuals committing the fraud. ACFE reported in their survey, "Report to the Nation on 2020 Global Study on Occupational Fraud and Abuse", asset misappropriation schemes were the most common type of occupational fraud.

Occupational fraud can be defined as "...the use of one's occupation for personal enrichment through the deliberate misuse or misapplication of the employing organisation's resources or assets" (ACFE, 2020, p.86). Other than the misappropriation of assets, there are two other occupational fraud schemes: financial statement fraud and corruption.

Asset misappropriation is divided into two main categories, namely (1) Cash theft that consists of theft of cash on hand, theft of cash receipt, and fraudulent disbursement, and (2) Inventory and all other assets that include misused and larceny (Wells, 2017). A study by Ab Majid et al. (2010) found that misuse of an asset, such as vehicles and Internet connection, computer equipment, stationery, and telephone usage are the most likely assets to be abused in the government sector under non-cash theft. The study also envisages that misappropriation of assets would increase in the future. Thus, an anti-fraud arrangement needs to be taken to address this problem, which demands organisational commitment and staff commitment to foster an ethical corporate environment (Majid et al., 2016).

The government of Malaysia has invested time, money, and effort monitoring and countering fraud. For example, in 2018, the government had established a Governance Integrity and Anti-Corruption (GIAC) centre to coordinate and monitor all activities related to governance, integrity, and anti-corruption in Malaysia. The GIAC has introduced National Anti-Corruption Plan (NACP) 2019–2023 as one of the government's initiatives to set a practical goal focusing on initiatives to be taken by both government and private institutions to combat corruption, enhance integrity, and implement governance practice (Abas et al., 2019).

The objective of NACP is to address the deterrence of asset misappropriation. The

NACP has listed a few strategies on asset misappropriation. For instance, strategy 1.1.9 emphasises the insertion of legal provisions on using the government's assets to promote the election of any candidate or political party as an offence under the Election Offences Act 1954. This strategy is issued to safeguard the government asset from being misuse for unofficial purposes. Furthermore, strategy 2.3.3 highlighted strengthening the mechanism in enforcing mandatory job rotation for public servants in high-risk position. The job rotation is Occupational Fraud Prevention Mechanisms (Shanikat et al., 2014) because employees who committed fraud tend to be continuously working the same job to mask their fraud. However, when the employee is compelled to do another task, the employee will no longer conceal their fraudulent activities.

Training Policy

Training policy plays a vital role in ensuring growth and progress in the organisation to ensure employees have the right knowledge, expertise, and skills to carry out their assigned duties. Campbell and Kuncel (2002) defined training as a planned intervention designed to enhance individual job performance determinants. According to Tziner et al. (1991), the main objective of the training is to assist individuals in creating aptitudes and abilities that, when connected to work, can improve their normal work execution in their current work. Thus, organisations are recommended to provide adequate training to enhance employees' knowledge to manage their assets better (Backer & Yusoff, 2015). This suggestion indicates the value of training, and it is imperative to decide its relative need compared to other components. This is support by Hipkin (2001), who stated that knowledge is fundamental to gain higher-level benefits in managing assets.

Abdullah et al. (2011) asserted that employees with specific skills, adequate experience, and sound technical knowledge are the most valuable assets of the organisation, fundamental and noteworthy in AM practices. The notion is supported by Shah et al. (2017), and Too (2012), who suggested that employees could improve their capability to manage assets through good training programmes, and they can exploit and utilise technologies for monitoring assets condition.

Training policy is a set of guidelines and requirements for transferring knowledge systematically and precisely to add knowledge and skills to meet the organisation's current needs and demands (Public Sector Human Resource Policy, 2005). It enables the organisations to plan on an ongoing investment for their employees and build competencies (Jackson et al., 2003), which benefits both the employees and organisations.

Relationship between Maintenance Practice, Asset Misappropriation, Training Policy, and Asset Management Performance

The framework of factors affecting asset management performance is built to propose the variables that directly impact government agencies' asset management performance. Previous literature found that maintenance practice (Al Marzooqi et al., 2019; Cholasuke et al., 2004), training policy (Al Marzooqi et al., 2019), and asset misappropriation (Effiok et al., 2012; Majid et al., 2014) have significant relationships with asset management performance.

Relationship between Maintenance Practice and Asset Management Performance

A comprehensive maintenance practice contributes positively to an organisation's overall strategic objectives (Muchiri et al., 2011). Poor maintenance will hinder value addition, delay the return of assets, and disrupt the business strategy. However, most managers regard maintenance as a financial burden (Sherwin, 2000) because maintenance involves enormous costs to the organisation. To address this issue, most organisations choose to maximise the available assets' performance by implementing strategic maintenance planning whereby the maintenance is conducted based on the necessity to avoid higher costs in the future due to equipment damage (Eti et al., 2006).

Past literature has acknowledged the relationships among maintenance management, performance, and profitability (Al Marzooqi et al., 2019; El-Akruti & Dwight, 2013; Kutucuoglu & Hamali, 2001). This is consistent with Chanter and Swallow (2007); they claimed that when maintenance work is not carried out effectively, user efficiency will be impaired, leading to poor organisational performance and profit loss. Maintenance management and government assets' effectiveness are critical factors in ensuring all government agencies are working to achieve their respective public interest objectives (Cholasuke et al., 2004).

Relationship between Asset Misappropriation and Asset Management Performance

Asset misappropriation has diverted finite resources and compromises the government's ability to deliver services and achieve intended outcomes (Public & Fraud, 2020). In this context, AM cannot be carried out effectively due to resource constrain. Insufficient money causes assets maintenance disrupted, and obsolete assets cannot be replaced; thus, the public cannot get quality services as needed. Majid et al. (2014) posited that reducing available resources would negatively affect the organisation's ability to achieve its goals set out in its vision, mission, and policy statements.

Asset misappropriation has a significant negative association with organisational performance (Effiok et al., 2012) because its resources are disrupted, and productivity is affected. Asset misappropriation also caused many parties to suffer (Nia & Said, 2015). The perpetrator will be penalised and may lose their jobs if caught. The government agencies are also suffering from a lack of resources and constraints in delivering services to people, impacting government agencies' reputation and credibility. Consequently, people do not get quality service from government agencies. Similarly, for this study, asset misappropriation is predicted to reduce AM performance in government agencies.

Relationship between Training Policy and Asset Management Performance

Training contributes to a culture of improving, learning, increasing employees' efficiency, and eventually increasing organisational performance (Kamoche & Mueller, 1998). Therefore, organisations should develop appropriate training programmes to improve employees' knowledge, skills, and abilities. Furthermore, sufficient knowledge and skills are vital for

managing assets because AM deals with various fields and often faces complex uncertainties (Schuman & Brent, 2005), such as technical and financial aspects. Thus, training can enhance employees' knowledge to promote better AM practice (Norhidayah et al., 2015). Lack of knowledge, incompetence, and unskilled employees may affect the quality of services delivered (Salah, 2016).

A study by Olaniyan and Ojo (2008), and Naqvi and Khan (2013) revealed that training has a significant positive relationship with organisational performance. The positive impact between training and organisational performance is that increased employees' skill, knowledge, and ability gained from training affects employees' commitment to the organisation, resulting in better productivity (Daniel, 2018). Therefore, it is necessary to improve and apply training as part of organisational agendas to achieve organisational objectives.

Nevertheless, several studies have also found that training did not directly influence organisational performance; other factors have mediated it, such as work climate (Gelade & Ivery, 2003) and organisational learning (Martínez-Ferrero & García-Sánchez, 2017). Based on previous literature, training is imperative to enhance employees' knowledge and abilities, leading to better asset management performance.

Conclusion

This study analysed the relevant literature to understand better the asset management landscape and factors affecting asset management performance. The literature review section also discusses asset management's significance and an overview of asset management practice in Malaysia. The government is committed to review and enhance the quality of AM to ensure it is managed in a systematic, holistic, and sustainable manner; hence, the issuing of policies and procedures regarding asset management since 1967. The importance of asset management has also been discussed in the literature review to explain why the government needs to manage assets effectively. This study is expected to help researchers and practitioners improve asset management performance by understanding and identifying the factors affecting asset management performance.

This study contributes to the literature by adding a new conceptualization to fill the literature gap highlighted in section 2.1.2. In addition, this paper can assist the government in implementing a systemic and comprehensive approach to asset management framework that reflects strategic execution elements highlighted: maintenance practice, assets misappropriation, and training policy in the current guidelines. Finally, implementing good maintenance practices, preventing asset misappropriation practices, and strengthening training policies in the AM framework can reduce auditors' repeated issues and enhance public money management credibility.

The study is based on the Auditors-General Report and the previous literature reviewed to fit the proposed concept. There are some limitations to this study. Firstly, the study only covered three factors affecting AM performance: maintenance practice, assets misappropriation, and training policy; future studies should explore more factors that affect AM performance. Secondly, this paper did not test the validity of the relationship on the variables of the study. Thus, In the future, this study would empirically validate the relationship to provide a better statistical standing of the variables used.

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