A Comprehensive Review of the Literature on IT Governance and Company Performance

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Abstract

Purpose – This study provides a comprehensive review on the analysis of the current trend of IT governance publications and literature on IT governance and company performance.

Methodology – The method of document analysis is used to collect the data published from 1992 to 2022 in the fields such as business and management studies, finance and accounting, corporate governance, and information technology.

Scope of the study – This study revolves around the analysis of the current trend of IT governance publications and a literature on IT governance, including corporate governance and its relationship with corporate governance of IT, its meaning, mechanisms, IT governance standards from international and Malaysian best practices, and the effect of IT governance on company performance.

Findings – Previous studies have found that adopting IT governance helps companies to achieve higher profits. However, the findings of the analysis revealed that there is still little research on the effect of IT governance on company performance. Although board and management involvement are important to ensure a high return on IT investment, the effect of these two elements on company performance has not been examined in previous studies.

Practical Implications – The findings provide researchers with knowledge on IT governance that can improve the way companies conduct their IT and enhance their performance.

Originality/ Value – This study is unique in that as it focuses on a comprehensive review of the analysis of the current trend of IT governance publications and a literature review on IT governance. The findings provide a clear picture of how the future research can be conducted by incorporating the effects of IT governance mechanisms, boards and management involvement on company performance.

Keywords: IT governance, IT framework, IT standards, company performance.

1. Introduction

The rapid expansion of IT is crucial to today's economic growth. It is undeniable that IT is an essential component of various types of business organizations. The survival of organizations gets to be complex and challenging if the implementation is not supported by the extensive use of IT in today's environment. The adoption of modern IT has revolutionized the growth opportunities for many businesses to stay ahead in the highly competitive market in the long run (Noor & Apadore, 2014). The increasing prevalence of technology has led many companies to adopt IT to enhance their capabilities and improve the efficiency of their business processes. The right use of IT can help improve performance and generate good returns for businesses (Batesug, Holton III, & Seyler, 1996).

Previous studies have found positive effects of IT governance on company performance (Khalil & Belitski, 2020; Jamba, Tsokota, & Mamboko, 2013; Neff et al., 2013; Flores et al., 2011; Lazic et al., 2011a; Lazic et al., 2011b; Estrada, 2010; Simonsson, Johnson, & Ekstedt, 2010; De Haes & Grembergen, 2009; Boritz & Lim, 2008; Boritz & Lim, 2007) and mixture results (Menshawy et al., 2022; Ilmudeen, 2021; Hamdan et al., 2019; Kaur , Mohamed, & Ahlan, 2012; Van Grembergen & De Haes, 2010). However, some previous findings have been unfavorable (Ugwuanyi & Ugwuanyi, 2013; Ekata, 2011; Liang, You, & Liu, 2010; Gaith, Khalim, & Ismail, 2008), so this study aims to fill this gap. Despite the fact that previous studies have demonstrated the positive impact of IT on organisational performance (Arabyat, 2014; Makindi, 2014; Safari & Zhen Yu, 2014; Romdhane, 2013; Beccalli, 2007; Premkumar, 2003), the phenomenon of IT projects still suffers from high failure rates.

Over the years, the landscape of IT investment has greatly increased and become challenging. Recent studies have uncovered unfavorable outcomes of several IT projects that have either failed completely or exceeded the budget and deadlines that were previously planned (CALLEAM, 2022; Eu, 2015; Solon, 2015; Standish Group, 2013; BERNAMA, 2012; Ombudsman, 2011). The increasing tendency for IT projects to fail should be of serious concern to companies, as IT requires high levels of investment. In the Canadian health sector, a $115 million integrated public health information system project IT was developed, known as the Panorama project. This project was unable to detect, manage and track a Covid 19 pandemic because it did not meet user requirements and had thousands of deficiencies (CALLEAM, 2022). It was reported that the UK government misspent more than £100 million of taxpayers' money on IT from 2013 to 2014 (Solon, 2015). The results showed that 43 per cent of IT projects in US and European companies went over budget, were delayed, and failed to meet project requirements, while 18 per cent of projects were considered failures (Standish Group, 2013). Ten high-risk projects IT totaling up to $1.3 billion were investigated by the Victorian Auditor-General's Office (VAGO) in 2011, and the investigation found that all projects failed to meet expectations and went over budget (Ombudsman, 2011). IT In Malaysia, cases of failed projects were no exception. The Malaysian Ministry of Health approved about RM2.59 million for two failed investment projects of IT pharmacy software programs, namely Pharmacy Enforcement Management System and Pharmacy Management System. The contract for both software projects was terminated by the Ministry due to poor performance (BERNAMA, 2012). In 2014, a case was reported by IT involving the

1BestariNet project, which was awarded to YTL Corporation Berhad by the Malaysian Ministry of Education in 2011. The project was unsuccessful, and the company was fined RM2.4 million by the Ministry for failing to perform satisfactorily in providing 10 000 schools with the 1BestariNet e-learning system.

Better company performance requires reliable governance, risk, and control practices of IT management. This means that the introduction of IT alone is not sufficient if it is not supported by other factors that can impact on company performance. Companies that concerned on the IT risk management raised an important question about the potential outcome of IT to improve company performance. This is because the survival of a business is highly dependent on the ability of the company to fully utilize IT as a strategic resource in businesses that creates a competitive advantage in the form of better financial performance. According to the IT Governance Institute (ITGI) (2003), the successful implementation of IT should be linked to proper corporate governance in order to reduce corporate uncertainty and improve their performance in pursuing their strategic planning. It is argued that companies with excellent IT corporate governance perform better and generate higher profits (Weill & Ross, 2004). Therefore, this study aims to provide a comprehensive review on the analysis of the current trend of IT governance publications and literature review on IT governance including the relationship between corporate governance in general and corporate governance of IT, the concept of IT governance, its importance, the mechanisms of IT governance, the nature of IT governance standard in the context of international and Malaysian best practices, and the effect of IT governance on company performance.

This study begins with the methods used to obtain the analysis of the current trend of IT governance publications and literature review on IT governance. This is followed by the findings and discussion which revolve around the literature review on IT governance. The discussion of the literature review begins with the relationship between corporate governance and corporate governance of IT, the concept of IT governance and its importance. The IT governance mechanisms and the implementation of IT governance standards in the context of international and Malaysian best practices are discussed in the next section, followed by the discussion on the effect of IT governance on company performance. The final section concludes the study.

2. Materials and Methods

This study is based solely on a review of research findings and data from the literature. In order to provide a comprehensive overview of IT governance literature and its contribution to company performance, this study found that document analysis is an appropriate and effective method to gather previous information on IT governance. Document analysis refers to the form of qualitative research where researchers use the document to express their voice and meaning around an evaluation topic (Bowen, 2009). O'Leary (2014) divides document analysis into three types of primary sources, such as public records, personal documents, and physical evidence. Public records refer to ongoing records of activities in organizations, such as student transcripts, annual reports, student handbooks and strategic plans. Personal documents include emails, blogs, journals, scrapbooks, Instagram posts and newspapers.

Physical objects, often referred to as artefacts, such as agendas, posters, and training materials, are categorised under physical evidence. However, this study follows an analytical approach proposed by previous study, focusing on several types of document analysis that includes journals, reports, books, conference papers, working papers, dissertation databases and some internet sources (Noor, Kamardin & Ahmi, 2017).

Some 92 sources of various kinds were consulted for the collection and analysis of literature, including journals, reports, books, conference papers, working papers, dissertation databases and some internet sources. All sources were analyzed from different areas of IT governance studies such as business and management studies, finance and accounting, corporate governance, and information technology system. Specifically, IT governance studies were retrieved from various publications of IT/ information systems journals such as Research Journal of Finance and Accounting, Information Systems Management, Information Management & Computer Security, Journal of Strategies for Information Technology Governance, Information Systems Control Journal, Industrial Management & Data Systems, Joint Inspection Unit, Journal of Information Systems, International Journal of Business and Management, Journal of Banking & Finance, European Business Review, Journal of Risk and Financial Management, International Journal of Accounting Information Systems, MIS Quarterly, MIT Sloan Management Review, and etc. The literature review covered the years 1992 to 2022 and considered previous findings on the analysis of the current trend of IT governance publications and literature review on IT governance including the relationship between corporate governance in general and corporate governance of IT, the concept of IT governance, its importance, the mechanisms of IT governance, the nature of IT governance standards in the context of international and Malaysian best practices, and the effect of IT governance on company performance.

In the following section of this study, the results of the previous studies are presented in detail. The section is divided into two parts, namely the results to be discussed on the current trend of IT governance publications and the literature review on IT governance.

3. Findings and Discussion

3.1 Current Trend of IT Governance Publications

This part of the study focuses on the results of the current development of IT governance publications in the period from 1992 to 2022. In this part, the results of the analysis of document types and subject areas are presented.

3.1.1 Types of Document Analysis

Figure 1 summarizes the distribution of seven types of document analysis published on IT governance from journals, reports, books, conference papers, working papers, dissertation databases and some internet sources. The figure shows that 48% of all publications are in 44 journals, followed by 19% in 17 conference papers, 15% in 14 internet sources, 9% in 9 books, 4% in 4 reports, 3% in 3 dissertations, and 1% in 1 working paper.
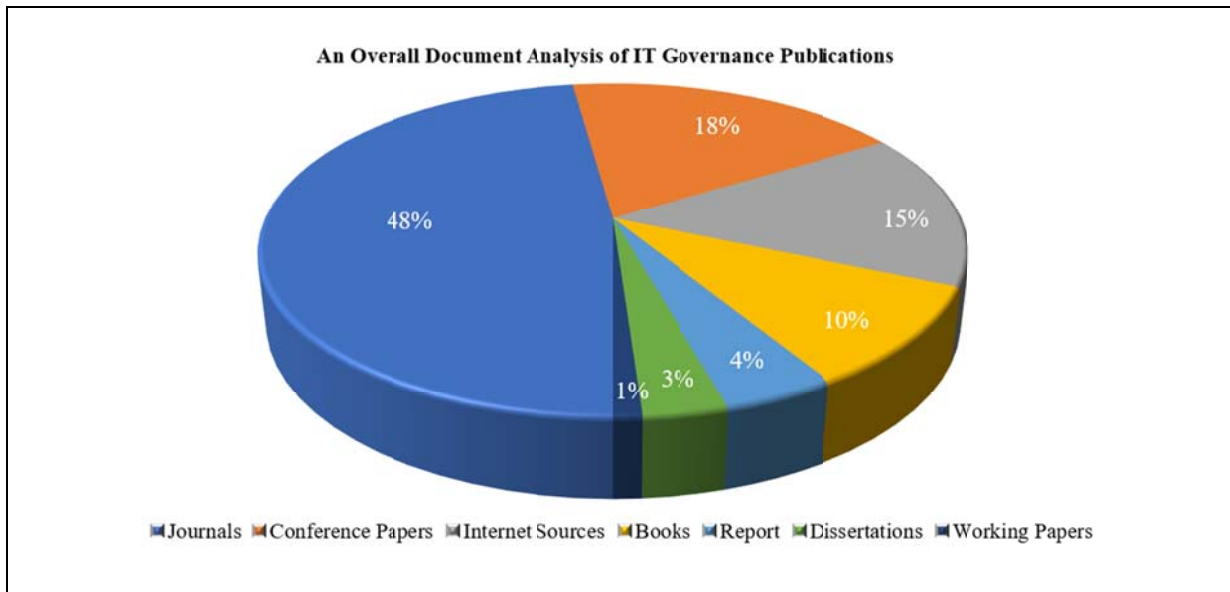
An Overall Document Analysis of IT Governance Publications

Figure 1. An Overall Document Analysis of IT Governance Publications

3.1.2 Subject Area

Based on all publications, IT governance practically covers the subject area of Business and Management, Finance and Accounting, Corporate Governance, and Information Technology System. *Figure 2* shows that over the period 1992 to 2022, more than half of the publications of IT governance are in the field of Information Technology System, namely 72% in 66 publications, followed by 15% in 14 publications on Finance and Accounting, 11% in the 10 publications on Business and Management, and 2% in the 2 publications on Corporate Governance.
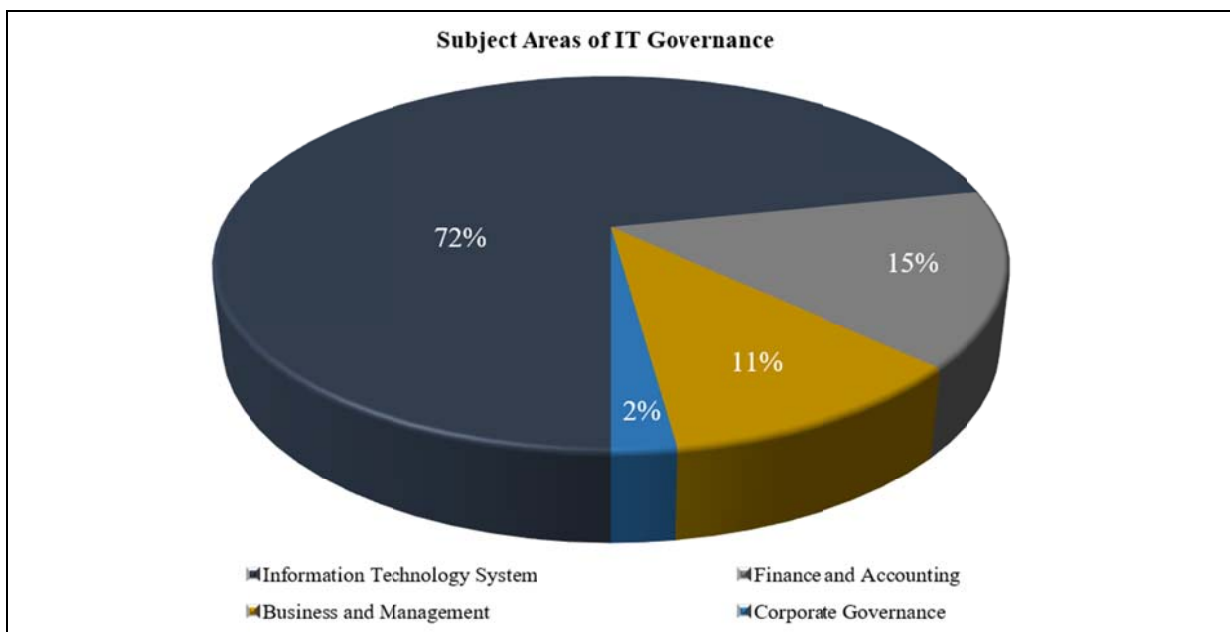
Subject Areas of IT Governance

Figure 2. Subject Areas of IT Governance

3.2 Literature Review on IT Governance

This part of the study goes beyond the discussion of several sub-themes that revolve around the literature review of IT governance. First, this sub-theme explains the relationship between corporate governance and corporate governance of IT. Second, the concept of IT governance, its meaning and the mechanisms of IT governance are discussed in the second, third and fourth sub-themes respectively. The following sub-theme is followed by the IT governance standards in the context of international and Malaysian best practices, while the last sub-theme discusses the effect of IT governance on company performance.

3.2.1 Corporate Governance in Relation to Corporate Governance of IT

To understand IT governance, the concept of corporate governance should first be understood (Leonida & Mulligan, 2005). According to the Security Commission of Malaysia in its Malaysian Code on Corporate Governance (SCM, 2021), corporate governance is a system by which companies are directed and controlled. Code (1992) describes that corporate governance was developed to create fairness, transparency, and accountability in the business environment to reduce governance problems and maximize value for stakeholders. Many countries have developed their own Codes of Best Practices in Corporate Governance as a comprehensive guide to assist organizations in carrying out their effective corporate governance with corporate discipline, accountability, and transparency of corporate governance practices to reduce investor risk, attract capital investment and improve company performance (Rezaee, 2009). The development of IT has become necessary and has led to the increasing reliance of companies on IT, which requires a greater focus on IT governance. IT governance is a part of corporate governance that focuses on the function of IT in organizations (Rowlands, De Haes & Van Grembergen, 2014). The concept of IT governance applies the concept of corporate governance to protect IT value and defines IT roles and responsibilities to mitigate IT risks (Hardy, 2006).

The corporate governance aspect of IT or IT is emphasized in this study to ensure proper implementation of IT and lead the companies to better performance. From a conceptual perspective, governance is related to accountability and responsibility within an organization and focuses on organizational structure, management mechanisms and policies (Al-Hatmi, 2012). In the literature, governance processes are divided into three main areas: Corporate Governance, Enterprise Governance, and IT Governance (Buckby, Best & Stewart, 2005). Today, the ubiquitous use of IT, the transformative impact and benefits for growth companies are undeniable. Many sectors and industries are increasingly reliant on IT to run their core business. While IT offers numerous opportunities and provides solutions to many of the challenges that businesses face, it also exposes businesses to risks. Therefore, understanding the governance of IT in this study is truly necessary and requires a general and comprehensive understanding of IT governance in depth.

3.2.2 The Concept of IT Governance

The concept of IT governance is defined by the Corporate Governance of IT (CGIT) and the Governance of IT. CGIT is a part of the corporate governance system (Van der Walt, Coetsee,

& Von Solms, 2013; SALGA, 2012; Mueller et al, 2008; Carroll, Ridley & Young, 2004; ITGI, 2003), whereby the use of IT is based on effective processes of evaluating, directing, planning and monitoring the company's IT strategy and policies to achieve company objectives (ISO /IEC 38500: 2008). In 2009, the King III defined governance of IT as an effective system of IT management resources to achieve the strategic objectives of the company (Noor, 2018; King III: 2009). IT governance plays an important role in driving digital initiatives in organizations (De Haes et al., 2020). Poor implementation of IT governance strategy could seriously affect organizational performance (Van der Walt et al., 2013). The composition of IT governance mechanisms, including a structure (e.g., IT steering committee), a process (e.g., portfolio management) and a relational mechanism (e.g., job rotation) (De Haes & Van Grembergen, 2016; 2004; Weill & Ross, 2004; ITGI, 2003) are important drivers for organizations to remain viable in the long term in today's digital age (Vejseli, Rossmann, & Connolly, 2020).

3.2.3 Importance of IT Governance

The successful implementation of IT depends on how well a company manages its IT governance. IT governance is about how companies maximize their long-term, sustainable IT investment returns to preserve stakeholder value. Therefore, maximizing the value of IT investments is important for successful IT governance (Parker, 2005). Failure to adequately manage the implementation of IT can lead to poor corporate performance (Van Grembergen & Haes, 2018). This is the main reason why IT governance is important and should be included as one of the corporate governance strategies of companies.

The purpose of adopting IT is to ensure that the implementation of IT is consistent with several company's objectives, such as aligning the IT strategy to create business value from IT; (ii) IT creates new opportunities and helps businesses maximize their benefits; (iii) maximizing the use of IT resources; and (iv) properly managing IT risks (ITGI, 2003). Previous studies conducted surveys to understand the importance of IT governance in Malaysian electronics companies (Tan, Chong & Eze, 2009a; Tan et al., 2009b; Tan & Eze, 2008). The results of the surveys consistently showed that IT governance is valuable for the companies' profit and growth, especially in the context of their cost efficiency, asset utilization and business flexibility. Several researchers argued that strong support and active involvement of the board of directors, IT steering committee and IT management level in the implementation of IT governance are also important to meet stakeholders' requirements, establish a well-communicated IT strategy and policy, and promote IT project success. In addition, effective IT governance also helps companies to improve their reputation, trust, cost efficiency, product leadership (Noor, 2018; Van Grembergen & Haes, 2018; Bowen, Chung & Rohde, 2007), asset utilization, company growth and company flexibility (Weill & Ross, 2005).

IT Governance help companies manage the risks associated with their IT management (Mohamed & Singh, 2012) and evaluate the efficiency of IT investments (Weill & Ross, 2004), which in turn has a positive impact on business performance (Scheeren, Fontes Filho, & Tavares, 2013). The adoption of IT governance mechanisms is necessary (Ali & Green, 2012; Weill & Ross, 2004) to help companies achieve their ultimate goal of alignment

between IT resources and business (De Haes & Van Grembergen, 2009), open up new opportunities for companies (Ali & Green, 2012; Sampler & Weill, 2003) and improve performance (Vejseli et al., 2020). However, there is no single IT governance model or framework that is suitable for all companies (Vejseli et al., 2020; Zhang & Chulkov, 2011; Hagen, 2008; De Haes & Van Grembergen, 2004), as business operations vary widely (De Haes & Van Grembergen, 2004). IT Strategy alone does not make for success; it must therefore be strictly controlled by appropriate standards and guidelines of IT governance.

3.2.4 IT Governance Mechanisms

The board of directors acts as the governing body responsible for the performance of the company. The board ensures that the IT resources of the company are managed efficiently and productively. Therefore, the board must have a clear understanding of the company's development strategy IT. In developing the IT governance model, boards should ask themselves several critical questions: (1) What decisions need to be made to properly manage and utilize IT? (2) Who is responsible for the decisions? and (3) How will the decisions be implemented and monitored? However, successful IT governance is not only the responsibility of the board, but also of the executive level, which sets the governance strategy, organizational structures, processes, and relationship mechanisms for the sustainability of IT governance (ITGI, 2003). The execution of IT governance may vary, as different types of business operations may have different combinations of governance structures, processes, and relationship mechanisms (De Haes & Van Grembergen, 2004).

IT Governance structures revealed the functions of IT executives, accountants, IT committees and councils for IT decision-making (Lunardi et al., 2017; De Haes & Van Grembergen, 2004; Peterson, 2003). Meanwhile, the IT processes encompass strategic IT decision-making and control oversight best practices. Basically, the IT processes facilitate companies to strategically plan, organize and control their IT decisions (Lunardi et al., 2017; Weill & Ross, 2004). The relational mechanisms include corporate/ IT participation, strategic dialogue, shared learning, and appropriate communication (De Haes & Van Grembergen, 2004; Van Grembergen, De Haes, & Guldentops, 2004; Peterson, 2003). Companies have the opportunity to find solutions to unleash their creativity in exploring solutions together (Peterson, 2004). Business/IT objectives, cross functional business/IT training, and collaboration between key stakeholders are examples of relationship mechanisms that enable the management level of IT to act effectively in line with the alignment of IT strategies (Burtscher, Manwani & Remenyi, 2009).

The effectiveness of IT governance behavior is particularly dependent on the company's management practices (Noor, 2018), which can harmonize the security level of IT, the methods of IT project management and the IT system to help the company facilitate changes in management (Zhang & Chulkov, 2011). The mechanisms of IT governance are important to ensure that the implementation of IT is properly managed in accordance with the strategic direction, planning and investment decisions of IT.

3.2.5 IT International Governance Standards and Best Practices

In building and maintaining transparency of IT governance best practices, it is important that

governance members ensure proper IT conduct that encompasses all company support mechanisms. In formulating IT's governance standards, the best practices of continuous integration can help to achieve the objectives outlined. The current development of the IT process has become more challenging; therefore, best IT practices corporate governance will also emphasize the adoption of national and international best standards of IT governance.

According to the Information Systems Audit and Control Association (ISACA, 2022), IT governance standards and best practices share the same goals, which focus primarily on establishing and implementing controls; preserving, maintaining, and accessing compliance issues; detecting and decontaminating vulnerabilities and deviations; and generating reports to demonstrate an organization's compliance. The standards include ISO /IEC JTC 1/ SC 40 IT Service Management (ITSM) and IT Governance (Shanahan, 2022), COBIT (Control Objectives for Information and Related Technologies) (ISACA, 2019), King III Code of Governance (Moolman & Ngwenya, 2016), Information Security Technique and the Sarbanex-Oxley Act requirements for IT Governance (SOX) (Tunggal, 2022). The standards are relevant to IT governance best practices, which can help the board to further promote a good IT governance environment in the company.

3.2.5.1 ISO/IEC JTC 1/SC 40 IT Service Management and IT Governance

Shanahan (2022), a former auditor and ISACA Hall of Fame inductee who attended the ISO /IEC JTC 1 subcommittee meetings for ISO SC 40 to be held in June 2022, summarized activities related to ISACA standards development. There are three subcommittees of ISO /IEC JTC 1, namely ISO /IEC JTC 1. SC7-Software-Development, ISO /IEC JTC 1. SC27-Information-Security and ISO /IEC JTC 1 SC 40-Governance and Management of IT. Specifically, SC40 was established to advance the frameworks, tools, standards, best practices, and associated documents for IT Service Management (ITSM) and IT Governance, including IT activities such as Risk Management, Governance, Audit, Outsourcing, Service Operations and Service Maintenance. As part of this standard, three SC40 working groups (WG) have been established (*see Table 1*) to provide an overview of the IT best practice frameworks and standards for organizations.

The implementation of ITSM is associated to the Information Technology Infrastructure Library (ITIL), which enables companies to better plan their strategic plans to achieve business goals. ITIL and ITSM are different from each other. ITSM refers to the service management practices that add value to the customer. In fact, ITIL is the best practice framework that follows ITSM as it improves work efficiency (Rance, 2015). ITSM activities include activities such as the change management planning process, error correction, and proper monitoring and control of the budget to ensure that IT systems are running smoothly. Rance (2015) argues that ITIL provides a best-practice framework for strengthening ITSM by ensuring that organizations take advantage of a technology and customer-centered design.

Table 1. Workgroup of ISO/IEC JTC 1 SC 40

WG 1 Governance of Information Technology	WG 2 Service Management-Information Technology	WG 3 IT-Enabled Services/Business Process Outsourcing
ISO/IEC 38507:2022 Governance implications of the use of artificial intelligence by organizations.	**ISO/IEC PWI TS 20000-14**: Guidance on the application of service integration and management to ISO/IEC 20000.	**ISO/IEC AWI 30105-1: 2016** IT Enabled Services-Business Process—Part 1: Process reference model (PRM).
ISO/IEC 38500:2015 Governance of IT	**ISO/IEC PWI TS 20000-15** – Guidance on the agile, develops and service management.	**ISO/IEC AWI 30105-2: 2016** IT Enabled Services-Business Process Outsourcing (ITES-BPO) lifecycle processes—Part 2: Process assessment model (PAM).
AWI TS 38508 Information technology—Governance implications of using shared digital service platform ecosystem organizations.		**ISO/IEC AWI 30105-3 :2016** IT Enabled Services-Business Process Outsourcing (ITES-BPO) lifecycle processes—Part 3: Measurement framework (MF) and organization maturity model (OMM).
WG 1 is also preparing a strategy for further development of the core governance standards. This will be considered at a meeting in November 2022		**ISO/IEC 30105-4:2016** IT Enabled Services-Business Process Outsourcing (ITES-BPO) lifecycle processes. Part 4: Terms and concepts
		ISO/IEC AWI 30105-5 :2016 IT Enabled Services-Business Process Outsourcing (ITES).
		ISO/IEC AWI 30105-5:2016: IT Enabled Services-Business Process Outsourcing (ITES-BPO) lifecycle processes—Part 5: Guidelines
		ISO/IEC 30105-8 IT Enabled Services-Business Process Outsourcing (ITES-BPO) lifecycle processes—Part 8: Continual Performance Improvement (CPI) of ITES-BPO.

3.2.5.2 COBIT (Control Objectives for Information and Related Technologies)

The Control Objectives for Information and Related Technology (COBIT) framework was developed by the Information Systems Audit and Control Association (ISACA) in 1996. The current version of COBIT 2019 was published in 2018. COBIT 5 was published in 2012, which was developed based on the link with COBIT4.1, Val IT and Risk IT. COBIT 2019 is an evolved version of COBIT 5 that shares the same goal and can be used by companies to effectively manage their data, information, and technology. The six governance principles of COBIT 2019 (*see Figure 3*) can benefit all companies, regardless of their size, geography, or industry (ISACA, 2019; Braga, 2010). The first principle of COBIT focuses on meeting stakeholder needs by generating value from the use of IT. The strategy of optimizing value from the use of IT, companies should be responsible for maintaining the balance between maximizing the use of IT resources and minimizing disruption during the process to maximize benefits.
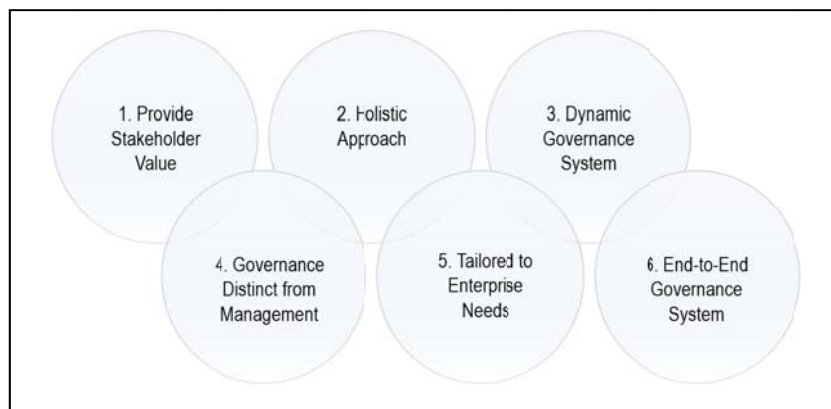

Figure 3. COBIT 2019 Governance System Principles

The second principle of COBIT is a holistic approach consisting of seven elements that support IT governance and management practices: (1) principles, policies, and framework; (2) processes; (3) organizational structure; (4) culture, ethics, and behavior; (5) information; (6) service infrastructure applications; and (7) people, skills, and competencies. The third principle focuses on the dynamics of the governance system. As strategy or technology changes, companies need to consider the impact on the company's IT governance system. According to the fourth principle, activities and structures must be separated between corporate governance and management. At the governance level, the responsibility of boards is emphasized to ensure that all governance objectives, including stakeholder interests, setting strategic direction, decision-making and performance monitoring, can be successfully achieved, while at the executive level, managers must ensure that all objectives, including all

activities such as planning, developing, and monitoring strategy, are consistent with the objectives set at the governance level. The fifth principle identifies the needs of companies that should be tailored to the governance system, while the last principle focuses on the governance system encompassing all corporate functions, IT functions and all technologies and information that companies use to achieve their objectives.

3.2.5.3 King III Code of Governance

The Institute of Directors established the King III Code on Governance on 1 September 2009, which came into force on 1 March 2010, replacing the King II Code on Governance (SALGA, 2012). The King III Code strengthens the previous King I and King II governance codes by introducing new recommendations that focus on issues of practice. The following are nine key requirements with some amendments that have been included in the new Code: (1) Ethical Leadership and Corporate Citizenship; (2) Boards and Directors; (3) Audit Committees; (4) Risk Governance; (5) IT Governance; (6) Compliance with Laws, Codes, Rules and Standards; (7) Internal Audit; (8) Governance of Stakeholder Relationships; and (9) Integrated Reporting and Disclosure. The King III Code on Governance clearly describes the responsibilities of boards and managers through seven principles that covering several topics of the IT Governance Code (SALGA, 2012), as shown in *Table 3* and *Table 4*.

Table 3. King III Code on Governance of IT

Principles		Recommended Practice	
King III Section	Principle	Sub section	Practice
5.1	The Board of Directors ought to be responsible for IT governance	5.1.1	The Board of Directors ought to be aware of their responsibility in governing IT and highlight it on the Board agenda
		5.1.2	The Board of Directors ought to be that an IT charter and policies are developed and practiced.
		5.1.3	The Board of Directors ought to be the promotion of a proper IT governance culture and consciousness of IT language.
		5.1.4	The Board of Directors ought to be that an internal control framework of IT is accepted and implemented.
		5.1.5	The Board of Directors should obtain independent assurance on the adequacy of the internal controls of IT.
5.2	IT should be adjusted with the company performance and sustainability goals	5.2.1	The Board ought to be that the IT strategy is coordinated into the strategic and business processes of the company.
		5.2.2	The Board of Directors ought to be that a process is in place to recognize and exploit opportunities to improve the company performance and sustainability through the IT utilization.
5.3	The Board of Directors should delegate responsibility for implementing an IT	5.3.1	Management ought to be responsible for executing the structures, processes, and mechanisms for the IT governance framework.
		5.3.2	The Board of Directors may delegate an IT steering committee with a similar function to help it within the governance of IT.
		5.3.3	The CEO ought to designate a Chief Information Officer (CIO)

governance framework to the management level			who is responsible for overseeing IT.
		5.3.4	The CIO ought to be appropriately qualified and experienced and regularly communicate with the board and/or the relevant board committee and senior management on strategic issues IT.

Source: South African Qualifications Authority, SALGA (2012).

Table 4. King III Code on Governance of IT (continued)

Principles		Recommended Practice	
King III Section	Principle	Sub section	Practice
5.4	The Board of Directors ought to monitor and assess on significant IT investments and expenditure	5.4.1	The Board of Directors ought to oversee the value creation of IT and monitor the return on investment of important projects of IT.
		5.4.2	The Board of Directors ought to ensure that Intellectual Property (IP) contained in information systems is secured.
		5.4.3	The Board of Directors ought to get independent assurance on IT governance and controls supporting outsourced IT services.
5.5	IT should be an integral part of the risk management of the company	5.5.1	Management should periodically demonstrate to the Board of Directors that the company has adequate arrangements in place to restore business capacity in the event of a disaster.
5.6	The Board of Directors ought to guarantee that data resources are overseen viably	5.6.1	The board should be satisfied that systems are in place to monitor information, which should include information security, information management and data protection.
		5.6.2	The Board of Directors ought to ensure that all personal data is treated and marked by the company as an important business asset.
		5.6.3	The Board of Directors ought to ensure that an Information Security Management System is created and actualized.
		5.6.4	The Board of Directors ought to favor the information security strategy and mandate as well as empower the management to conduct the strategy.
5.7	A risk committee and an audit committee ought to support the board of directors in the performance of its duties IT.	5.7.1	The risk committee ought to ensure that the risks of IT are adequately addressed.
		5.7.2	The risk committee ought to provide reasonable assurance that controls are in place and effective to address the risks of IT.
		5.7.3	The audit committee ought to review IT in relation to financial reporting and going concern.
		5.7.4	The audit committee ought to consider the IT utilization to improve audit scope and effectiveness.

Source: South African Qualifications Authority, SALGA (2012).

3.2.5.4 Information Security Technique

A company's greatest asset is its information, and if it is not managed, it can have a negative impact on the process of achieving the company's desired results. ISO / The IEC 27001 information security management system (ISMS) is designed to ensure that companies can effectively manage their IT risks. The development of an information security policy ensures that effective, documented security controls are in place to ensure that all users of networks or the IT structure within organizations comply with data security regulations that are stored digitally within the boundaries of the organizations extending their authority.

The ISO /IEC 27001 does not prescribe specific information security controls as it only defines the mandatory requirements for ISMS. However, ISO /IEC 27002 identifies appropriate information security controls within ISMS and leaves it up to companies to control them as they see fit. The latest version of ISO /IEC 27001 was published in 2013, namely ISO /IEC 27001: 2013, and includes a section called Annex A, which includes objectives for information security controls and information security controls derived from and guided by ISO /IEC 27002: 2013. Next, the latest version of ISO /IEC 24762 has been developed to help companies deliver IT disaster recovery services as part of business continuity management. This standard supports the operation of ISMS for the IT operations and recovery strategy of enterprises to ensure their effective business continuity. Inadequately secured data leads to data loss that can seriously cripple businesses. With the growing number of threats to information security, businesses are beginning to implement best practice controls to protect their data assets. Implementing security controls can save companies from security breaches and the associated financial and reputational damage.

3.2.6 IT Governance Standards in Malaysia

The formulation of the Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP- EAGA) Vision 2025 (BEV 2025) has encouraged the continuous efforts of member countries, especially in empowering IT strategic approaches that are in line with the long-term goals of BEV 2025 (BIMP-EAGA, 2021). IT is an engine for growth and quality of life for the people of BIMP-EAGA. IT aims to transform BIMP-EAGA into a digital community with quality infrastructure, improved accessibility, skilled human resources, and technological advances. The development of the IT sector with infrastructure, networks, media, IT products and service industries can help alleviate poverty and increase productivity and economic growth (BEV 2025).

According to the BIMP-EAGA report, a Memorandum of Understanding (MOU) for Governance and Development Cooperation in IT and Multimedia was signed in 2007, which includes the promotion of IT policies and frameworks. The MOU promotes harmonization between regulators, the private sector, and communities to ensure the implementation of IT and multimedia in the countries participating in the MOU. The report also highlights several areas of cooperation included in the MOU such as: (i) capacity building for soft and hard IT infrastructure and in the multimedia and digital creative industries; (ii) enhancing the skills of IT professionals; and (iii) developing IT and multimedia and digital creative products and services, which form an overarching framework in the IT sector strategy under BEV 2025.

Several IT frameworks have been created by the Malaysia Administrative Modernization and

Management Planning Unit (MAMPU) as baselines for IT governance, but according to Maidin and Arshad (2010), the MAMPU model did not particularly coordinated each framework into the appropriate IT governance practices model. Prior studies have revealed that the adoption of IT governance in Malaysian companies is still weak (Kaur et al., 2012; Othman, Chan, & Foo, 2011; Teo & Tan, 2010). Previously, two studies conducted on electronic manufacturing companies (Teo & Tan, 2010; Tan, Eze, & Teo, 2008) and industrial service companies in Malaysia (Teo & Tan, 2010) found that the level of consciousness of IT governance was discouraging and prepared for any significant opportunities' enhancement for the governance. Besides that, results obtained from a survey of various companies in the Malaysian sector found that about 50 percent of the companies were less mature in their IT governance practice (Othman et al., 2011). As Critical National Information Infrastructures (CNIIs) have become larger and more complex, securing all infrastructures is important to avoid significant negative impacts on other sectors. Mandatory regulations issued by the Malaysian government in 2010 require all public sector CNII organizations dealing with critical national information infrastructures to be certified to ISMS and MS ISO /IEC 27001:2007 by 2013. As outlined in Malaysian CyberSecurity (2015), CNIIs associate with IT assets, systems, and functions for all sectors. Any harmful act would negatively impact the national economy, defense, security, the country's reputation, and the government's ability to oversee the citizens' healthcare system. The results of the previous observation showed that only fourteen of the three hundred listed CNIIs in Malaysia were certified to ISO /IEC 27001, while only six public institutions were certified to ISO /IEC 27001 (Othman & Chan, 2013).

However, the Malaysian government still inadequately serves and manages its own internal system, despite the existence of many established frameworks, tools, and standards for IT governance (Hamim & Sulaiman, 2015). Hamim and Sulaiman (2015) have proposed a governance framework for internal system development for the Malaysian Public Service Department (MPSD), which includes the IT governance, COBIT® 4.1 and 3P Model frameworks. These three frameworks provide Malaysian government agencies with a guide to strengthen their IT management strategy. The MAMPU commenced the development of the Public Sector Digitization Strategic Plan (PSDSP) for 2021-2025 in January 2020. This plan can improve public service delivery through digitization for the benefit of citizens and improve living standards to ensure a sustainable digital government on the way to a digital society by 2030.

The PSDSP 2021-2025 outlines several strategic directions of the public sector digitalization which are composed of strategic thrust, strategies, programs, and high-level action plan. This comprehensive digitalization strategic plan has been aligned to various plans and blueprints at the national and global level namely Shared Prosperity Plan 2030, Twelfth Malaysia Plan (12MP), National Policy on Industry 4.0, The 10 Essentials to Achieve National Goals, *Jalinan Digital Negara* Plan (JENDELA), PRIHATIN Economic Stimulus Package, National Anti-Corruption Plan 2019-2023 and Sustainable Development Goals (SDG) 2030 based on the concept of "leaving no one behind" and "Whole of Government". The purpose of the establishment of these strategic directions are outlined in helping the public sector ministries and agencies to have proper planning, alignment, and implementation of digitalization

initiatives. Apart from that, this plan also supports the Smart Nation and Fourth Industrial Revolution (4th IR) in providing better leverage of data, harness emerging technology and accelerate more efforts to contribute to the digital economy and develop digital society.

3.2.7 The Effect of IT Governance on Company Performance

Studies on the effects of IT on company performance are of interest to researchers (Kaur et al., 2012). The effective usage of IT is described by good IT governance (Hamdan et al., 2019; Neff et al., 2013; Zhang & Chulkov, 2011; 2008; Weill, 2004; ITGI, 2003), hence led to better company performance (Khalil & Belitski, 2020; Jamba et al., 2013; Neff et al., 2013; Flores et al., 2011; Lazic et al., 2011a; Lazic et al., 2011b; Estrada, 2010; Simonsson, Johnson, & Ekstedt, 2010; De Haes & Grembergen, 2009; Boritz & Lim, 2008; Boritz & Lim, 2007). Furthermore, effective IT governance could be a success factor for the performance of successful companies IT (Zhang & Chulkov, 2008; Batesug et al., 1996), which is consistent with Weill's (2004) argument that "setting the framework for decision rights and responsibilities encourages desirable behavior when using IT."

As a sub-set of corporate governance, IT is therefore important as any other board strategic agenda (ITGI, 2003) to positively influence the performance of companies, as evidenced by the results of previous studies (Neff et al., 2013; Flores et al., 2011; Lazic et al., 2011a; Lazic et al., 2011b). Due to the failures of IT projects identified in previous studies, many companies have begun to recognize the need to manage their IT behavior through IT best practices. Despite the fact that numerous companies have recognized the remarkable importance of IT for their business operations, it has been shown in the past that the level of IT adoption is still low (Kaur et al., 2012; Othman et al., 2011; Teo & Tan, 2010; Guldentops, 2007). For example, some IT governance variables, such as committee structure and corporate collaboration, have been found to have a positive impact on company performance. Be that as it may, Kaur et al. (2012) found that IT governance, as measured by IT processes, structures and relationship mechanisms, has no impact on the performance of Malaysian listed companies.

Van Grembergen and De Haes (2010) explored the relationship between Enterprise Governance of IT (EGIT) practices and business performance in different regions of the world and different industries. COBIT and Val IT were utilized as intermediaries to measure EGIT in this study. However, the results provided little evidence of a direct link between EGIT practices and corporate performance. In addition, Guldentops (2007) addressed Val's seven principles IT, which can be adopted to ensure that investments made by a company IT are maximized at a reasonable cost and with an acceptable level of risk. A face-to-face survey of 15 Chief Information Officers (CIOs) was also conducted to investigate the level of adoption of Val IT principles. However, the level of adoption of Val IT principles has yet to be investigated and the CIOs assured to do so in the future.

Previous studies have shown that some companies have benefited from adopting IT good governance practices. In addition, several studies have shown that companies that use IT governance have higher profits than companies that follow similar strategies but do not have IT governance support (Weill & Ross, 2004). Moreover, a great execution of the IT process is related to the dissemination of IT knowledge in corporate governance, which leads to better

company performance (Boritz & Lim, 2007). Boritz and Lim (2007) also found that the execution of IT governance mechanisms (IT strategy committee and CIO) and IT knowledge possessed by the top management level have contributed to higher company's financial performance. Therefore, the involvement of the top management level in terms of knowledge contribution and implementation skills in IT is vital, driving to way better company performance. Boritz and Lim (2008) found that the shortcoming of IT controls impede the execution of IT governance mechanisms (IT processes, IT structures and IT relationship mechanisms), thus worsening company performance. However, the effectiveness of IT governance mechanisms has greatly reduced the likelihood of a company reporting material IT control deficiencies, which has a positive impact on the company's financial performance. As IT investments become more common and have a significant impact on company performance (Zhang & Chulkov, 2008), they need to be managed through the right execution of IT governance mechanisms (Samuwai, Prasad, & Heales, 2012).

Some researchers considered that the relationship between IT governance and organizational performance has not however been investigated (Lazic et al., 2011a; Lazic et al., 2011b; De Haes & Van Grembergen, 2009). Lazic et al. (2011a) proposed a theoretical framework for the relationship between IT governance and company performance with the moderating variables IT relatedness and business process relatedness. The results of the study are consistent with other previous studies (Neff et al., 2013) that demonstrated a positive relationship between IT governance and company performance with the two moderating factors. In another study, Lazic et al. (2011b) examined the effect of IT governance maturity on business performance with several mediating variables (IT relatedness, business process relatedness, and resource relatedness) and one moderating variable (Absorptive Capacity of IT Department).

Accordingly, all factors showed positive impacts on company performance, except for resource connectedness, which disclosed an unconfirmed effect on company performance. Jamba et al. (2013) further extended the study of IT governance mechanisms by establishing outcome metrics (Bowen et al., 2007) and considering the impact factor of board members on organizational effectiveness. The study found that the involvement of senior management in IT governance structures, processes and outcome metrics at the corporate level has a positive impact on organizational effectiveness. As the integrity of organizations' information resources is exposed to many threats and risks, decisions on information security investments (IS) are essential to mitigate potential negative impacts on organizational goals (Flores et al., 2011; Tsiakis & Pekos, 2008), which can improve overall organizational performance (Tsiakis & Pekos, 2008).

In addition, Tsiakis and Pekos (2008) suggested security mechanisms that allow companies to assess the security properties of their confidentiality, integrity, authentication, availability, and accountability dimensions in order to minimize potential risks. The study focused not only on IS products such as antivirus and firewall software to avoid unauthorized access, but also on how IS investments can add business value to the companies. In addition, companies ought to recognize the significance of investing in IS as it assists them avoid losses from viruses and monetize the loss of security services. Clader and Watkins (2012) also argued that IS is indeed critical to the long-term success of any business. The researchers also suggested

using the IT governance standard ISO 27000 as a framework for meeting common objectives related to IT governance to ensure security, privacy, and confidentiality of information assets. Meanwhile, Flores et al. (2011) claimed that a single IT governance framework and investment in IT governance COBIT could strengthen IS objectives.

Discussions on IT governance revolve around its models related to the adoption of norms, its mechanisms, and various strategic issues and implications for companies and organizations. However, what is rarely discussed in the context of IT is the board. According to Candour Governance Specialists, the application of the King Code III is ultimately the role of boards to ensure that their business and IT strategies are implemented and adequately managed within an appropriate system of internal control. As companies have invested in IT and this investment involves high risks, board involvement is important to adequately manage IT investments, IT risks, IT benefits and the security of information assets (Menshawy et al., 2022; Estrada, 2010; ITGI, 2003).

A previous study found that the IT governance structure of the board and the IT governance relationships between the board and supervisory board had a significant direct and indirect relationship with company performance through IT capabilities. However, the outcome of IT capabilities did not affect the relationship between board IT governance processes and company performance (Menshawy et al., 2022). Furthermore, Estrada (2010) emphasized that studies on board roles in IT are often too narrow in the field of corporate governance research. Moreover, in his quasi-experimental study, Estrada (2010) highlighted that embedding the structure of IT must be part of corporate governance practices of companies in order to improve their performance metrics. He also emphasized the importance of boards having the skills of IT to have a good impact on corporate value. It was expected that the findings of this study would have a positive effect on companies that incorporate IT and corporate governance practices to improve board contributions. Meanwhile, Coats (2015), reviewing IT governance studies, concluded that board involvement in IT issues is crucial, rather than relying solely on executive involvement and oversight.

4. Conclusion

In recent years, it has become apparent that the development of IT has prompted many nations, industries, and companies to invest heavily in IT. Apart from the widespread use of IT, many researchers have questioned whether such investments are worthwhile for companies. The development of IT promises both higher productivity and better performance of the business planning process of companies. This study was motivated by several alarming problems of failure of IT investment projects, and it is still questionable whether the investment can bring real benefits to enterprises. Increasing investment in IT alone is not enough to improve business performance unless its implementation is supported by good IT governance practices. There is no single approach or standard for implementing IT governance mechanisms that would suit the nature of each company (De Haes et al., 2020; De Haes & Van Grembergen, 2016; 2008a; 2008b; 2004). However, by adopting IT governance, companies can improve their operations and implement strategies that enable them to better compete now and in the future. The IT governance mechanisms presented in the previous research enable companies to take full advantage of their information and

maximize benefits, as well as seize opportunities and gain competitive advantage.

The aim of this study was to provide a comprehensive review on the analysis of the current trend of IT governance publications and literature review on IT governance and its contribution to company performance. This study provided a comprehensive review of the existing literature on IT governance aspects from 1992 to 2022 that covered on the analysis of the current trend of IT governance publications and literature review on IT governance including the relationship between corporate governance in general and corporate governance of IT, the concept of IT governance, its importance, the mechanisms of IT governance, IT governance standards in the context of international and Malaysian best practices, and the effect of IT governance on company performance. This detailed literature review can have direct implications, particularly in the academic environment of IT as well as in the context of company's performance. It helps to provide an approach to exploring the content of the IT governance literature and company performance and is thus a starting point for researchers who will conduct further studies in this area. Future research directions could seek to broaden the scope of the study by sampling and analyzing the effect of IT governance on company performance by including important influencing variables of IT governance mechanisms such as IT structures, IT processes and IT relationship mechanisms, and by considering the involvement of both the board of directors and the management level in IT governance.

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