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Recent Development on Information System Capabilities and Sustainable Competitive Advantages: A Research Model, Review and Directions for Future Research

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Abstract: In today's competitive environment, maintaining a competitive advantage to achieve high performance is a significant challenge for businesses. To succeed, organizations must not only develop competencies in their focus areas but also be able to adapt, change, and realign those competencies in a dynamic and competitive corporate environment. As a result, information system (IS) capabilities are growing in significance as a strategic element that supports the development of competitive advantages and organizational survival. By examining the gap from the prior research, this study intends to answer questions about the link between information system (IS) related capabilities and the sustainable competitive advantages of an organization. The dimensions of information system capabilities (Personnel capability, Administrative capability, Infrastructure capability, and Information management capability) are factors that could explain a firm's sustainable competitive advantage and the theory of dynamic capability is used as the guiding theory, as guidance, and to support the conceptual framework. This will clarify how firms may use their resources and capabilities to boost the effectiveness and utilization of information systems (IS) in daily operations, processes, and people's performance.

Keywords: *Information system capabilities; bureaucracy; sustainable competitive advantage; dynamic capabilities.*

1. Introduction and Background

The creation of competitive advantage is increasingly essential for success and a crucial aspect of strategic governance for organizations. However, it is suggested that only a small number of businesses are able to maintain a competitive advantage (Hazzaa, 2018), and earlier research has shown that sustaining a competitive edge requires dynamic firm capabilities to ensure that organizations not only create competencies in their pursuit areas, but are also capable of adapting, changing, and realigning those competencies in a dynamic and competitive corporate world, leading to achieving high-quality performance (Hazaa 2018; Teece, 2007). In the competitive marketplaces of today, intellectual and knowledge-based resources, as well as information technology-enabled skills drive firm performance rather than physical resources. Many organizations struggle with the capability to build market-based capabilities as an essential component of creating sustainable competitive advantage. When a firm's resources and capabilities are efficiently handled through the combination of skills and knowledge, the firm benefits.

At this time, the sustainability and profitability of many firms depend on their ability to use information systems (IS) creatively. To handle information successfully, IS offers information services that deal with business systems, processes, and people. In addition to facilitating organizational transformation, IS offers new opportunities for businesses to redesign their business processes and working practices (Aydiner, 2019; Dedrick, Gurbaxani, & Kraemer, 2003). The main challenges that the majority of modern organizations confront are high-quality performance, dependability, and profitability. With regard to these challenges, information systems are evolving into crucial strategic elements that support the development of competitive advantages and organizational survival (Abugabah & Sanzogni, 2009).

Collectively, several studies have been conducted to resolve a wide range of issues related to IS on firm results (Al-Rawahi & Al-Kharusi, 2020; Aydiner 2016; Aydiner et al., 2019; Barker et al., 2021; Bharadwaj, 2000; Chen, 2012; Gu & Jung, 2013; Kim, Oh, Shin, & Chae, 2009; Lertwongsatien & Ravichandran, 2005; Mithas et al., 2011; Nguyen & Nguyen, 2021; Tippin & Sohi, 2003). According to Aydiner (2016), most of the IS research focused on the technological viewpoint rather than prioritizing the business value. The findings of those earlier studies are fragmented, thus inconclusive, as to what factors could specifically explain the impact of IS-related capabilities on a firm's competitive advantage. Furthermore, several researchers pointed

out that the strength of some IS capabilities is dependent upon interactions or combinations with other capabilities and therefore no single capability becomes the most important to firm performance (Prajogo, 2018; Mackenzie et al. 2011; Devece et al. 2016). The earlier study had considered a wide range of IS capabilities from broad categories that explain their effect on firm results. Most of the earlier studies were conducted in developed economy setting and biased toward knowledge-intensive industries (Devece et al. 2016; Carmichael et al. 2011). Thus, the findings could be misleading and extra care is needed when the findings are used in a different economic setting such as in Malaysia.

Government-Linked Companies (GLC) have historically been important to the development of the Malaysian economy. According to Kowalski et al. (2013), Malaysia has the fifth-highest percentage of state-owned enterprises (SOEs) among the largest companies of any country in the world. Despite being a part of government policy in the development of the country, GLCs had a market capitalization of about RM 250 billion (USD 1.7 billion), or about 36% and 54% of the market capitalization of Bursa Malaysia and the benchmark Kuala Lumpur Composite Index (KLCI), respectively (PCG, 2015). GLCs have a significant presence across all industries, with a concentration in utilities (93%) and transportation and warehousing (80%), where their share is more than 50% in agriculture, banking, information communications, and retail trade (Menon, 2014). GLCs are widely present in various industries, and it is believed that their performance has a significant role in the nation's economic progress. However, few studies in the IS literature discuss these capabilities in the context of Malaysian government-Linked companies.

More recently, several other researchers also looked at other factors and suggested that these factors have an impact on IS and organizational results to some extent (Harun, Saud, Isa & Hussain, 2016; Kim et al, 2014). One key factor is bureaucracy. There have been numerous studies concerning bureaucracy and firm performance, however, limited studies can be found to have examined the bureaucratic characteristics within the context of Malaysian GLCs. A previous study also suggested that more critical research is needed to investigate the bureaucratic process between business operations in Malaysia. It is argued that lengthy and time-consuming administrative procedures pose distinguished challenges to the management of businesses in Malaysia (Harun et al, 2016). In addition, earlier studies also found that state-owned GLCs generally face more bureaucracy, more redundancies and a greater agency problem, thereby affecting firm efficiency (Najid & Rahman, 2011).

The Putrajaya Committee GLC High-Performance Report (2014) states that GLCs are anticipated to obtain a competitive advantage, which is extremely crucial in guaranteeing the sustainability, business survival, and long-term success of GLCs. However, the Global Competitiveness Report 2017–2018 highlighted inefficient bureaucracy as one of the biggest challenges faced by Malaysian businesses. Governments have made significant attempts towards addressing this negative perception, but rankings for bureaucratic efficiency remained low (Haryono & Khalil, 2011). Therefore, further investigation is needed to determine how bureaucracy influences the relationship between ISC capabilities and competitive advantage. By examining the gaps from the previous research, this survey paper's primary focus is to investigate the persistently significant impact of IS capabilities on organizations' sustainable competitive advantage. The main contribution of this paper is to address issues related to the relationship between information system capabilities and sustainable competitive advantage.

2. Literature Review

One of the theoretical models to enthuse recent research in information systems (IS) is the resource-based view (RBV), where earlier works in the fields were undertaken by Powell and Dent- Micallef (1997), Mata et al. (1995), and Clemons and Row (1991). The resource-based view (RBV) of the firm was spawned by the work of Penrose (1959), in which she highlighted the basis of the RBV theory by regarded that firms were "resource bundles" and that these resources give each firm its unique character and clarified essentially the difference in performance between firms. Later the theory was expanded further by Teece (1982), and Wernerfelt (1984), where the significance of the resource perspective as an explanation for variations of performance between firms was broadly recognized and the RBV theory also determined a new direction in the field of strategic management. Later, Barney (1991) developed a more concrete and comprehensive framework for identifying the necessary features of business resources to achieve sustainable competitive

advantage.

Many authors in IS studies (Bharadwaj, 2000; Kim et al., 2009; Mithas et al. 2011, Chen, 2012; Gu & Jung, 2013; Devece, 2016; Aydiner et al. 2019) adopted Barney's (1991) theory that only resources that are valuable, rare, unique, and non-substitutable can generate and sustain competitive advantage. The fundamental premise of the RBV is that a business is thought of as a collection of productive assets of which worth for firm growth resides not in the assets themselves but rather in the services or applications they provide. The RBV examines the relationship between the internal features of the firm and performance, arguing that firms have the resources to develop a competitive advantage to attain superior performance. (Wernerfelt, 1984; Barney, 1991).

Although the resource-based view (RBV) can explain an organization's current competitive advantage, researchers like Teece et al. (1997) and Eisenhardt and Martin (2000) have criticized it for its static nature and inability to explain the organization's sustainable competitive advantage. To get beyond its multiple shortcomings, the RBV theory has to be improved and extended in the present dynamic business environment additionally, they suggested the idea of "dynamic capability." According to Teece (2007), dynamic capabilities are the skills necessary to adapt to a volatile environment through the integration, development, and reconfiguration of internal and external competencies in periods of rapid technological change. These skills enable business enterprises to develop, use, and safeguard firm assets that support superior long-term business performance. Teece et al. (1997) further emphasized that even after amassing all of the priceless technological assets, a "resource-based strategy" alone is unable to maintain its notable competitive advantages. According to this concept, information systems (IS) capabilities are linked to resources and competencies, and when both of these elements come together, they form the basis of a competitive paradigm that provides knowledge to organizations that enhance performance (Peppard & Ward, 2004).

According to Lim et al. (2011), the dynamic capacity theory served as the foundation for earlier studies on IT business values that were both theoretical and empirical. For instance, Olszak (2014) proposed a model of business intelligence and analytics as a dynamic capability and demonstrated that six areas of business intelligence and analytic capabilities (governance, culture, technology, people, processes, and change and creativity) ought to be simultaneously developed to integrate, build, and reconfigure informational resources and business processes that can address rapidly changing business environments. Battleson et al. (2016) looked at how IS capabilities can expedite an organization's pursuit of dynamic capabilities. The two key elements—the capacity to update an organization's capacity to adapt to the changing business environment and the crucial role of strategic management in the adaptation, integration, and reconfiguration of internal and external resources, functional competencies, and organizational skills to meet the demands of an evolving environment—were highlighted by the concept of "dynamic capabilities." By generating consistency in dynamic situations like the shakeout of firms and the growth of innovation across the industry life cycle, dynamic capabilities may be a key driver of the industry life cycle (Mitchell & Skrzypacz, 2013).

Considering the dynamic nature of today's business landscape, the present study is grounded in the theory of dynamic capabilities, serving as the theoretical basis for this research. Specifically, the study emphasizes the information system (IS) capabilities of firms, encompassing both resources and competencies, as potential factors influencing a firm's sustainable competitive advantage.

Previous studies on Information system (IS)

Many recent studies, guided by the RBV and dynamic capability framework had identified and investigated various IS capabilities that lead to competitive advantage and/ or firm performance (Al-Rawahi & Al-Kharusi, 2020; Aydiner et al, 2019; Barker et al., 2021; Chen, 2012; Gu & Jung, 2013; Mithas et al, 2011; Nguyen & Nguyen, 2021; Pérez-López & Alegre, 2012; Wang et al, 2015). A large number of factors (resources and competencies) affecting firm performance had been suggested by the literature, thus producing conflicting findings and had resulted in a lot of confusion. Several studies had classified these factors and subsequently developed IS capabilities and firm performance models (Aydiner 2016; Gu & Jung, 2013; Mithas et al, 2011). Despite being no consensus as to what factors can specifically explain firm performance, none of these studies had actually sought to investigate the effect of IS capabilities on a firm’s sustainable competitive advantages

particularly in a developing country setting. An example of this is seen in the work of Mithas et al. (2011), who constructed a model to examine firm performance. They proposed that IT-enabled information management capabilities have a positive impact on various measures of firm performance, including customer satisfaction, financial outcomes, human resources, and organizational effectiveness. The study's significant findings highlight important managerial implications, emphasizing the need for senior leaders to prioritize the establishment of suitable conditions for the development of IT infrastructure and information management capabilities. These foundational capabilities are crucial for enhancing overall firm performance and building other complementary capabilities. This means the IT infrastructure is the supply side of IS capabilities and has become the foundation of all business applications. It establishes the technical platform and the service resources needed to respond rapidly to a business' needs and changes. Although their study found several interesting findings, the factors considered in this study were rather limited to a single capability and thus cannot really explain the other relevant IS capabilities that can influence firm performance.

Gu and Jung (2013) proposed a new model, an IS-integrated model formed from three conceptual frameworks: the Resource-Based View (RBV), process capabilities, and the Information Systems (IS) Success Model (ISSM). The study examined the influence of information technology resources, capabilities, and traits on organizational performance. It also provided an integrated strategy for assessing organizational effectiveness. IS capabilities were defined in this study as the firm's ability to carry out routines inside the IS department and support the delivery of IS services to the organization. The determination of IS capabilities (derived from IS resources and complimentary firm resources) merely on the IS processes is rather constricted and cannot explain as there might be other capabilities affecting firm performance. Also, some studies have accepted that IS capabilities are related to resources and competencies, which was not considered in this study.

Bhatt, Wang, and Rodger (2017), on the other hand, performed a study that viewed IS competencies as IS capabilities. Their study sought to investigate the role of organizational learning intensity in regulating the link between IS competencies and competitive advantages. IS infrastructure flexibility, IS business competence and IS business relationship were among the highlighted capabilities. The study's findings revealed that the flexibility of IT infrastructure, IT business skills, and learning intensity all had a substantial impact on competitive advantages. Organizational learning intensity, in particular, positively impacted the relationship between IT business skills and competitive advantages. However, it had no moderating influence on the relationship between IT infrastructure flexibility and competitive advantages.

Aydiner et al. (2019) then created a model to determine the elements influencing firm performance. Their research concentrated on three intangible assets associated with IS capabilities: IS infrastructure capability, IS-human resource capability, and IS-administrative capability. Multiple mediating factors, such as decision-making performance and business-process performance, were discovered and their influence on firm performance was examined. The study's major findings highlight the proposed serially mediating model's crucial mediating function in the links between human resource and administrative-related IS capabilities and firm performance.

Another study, by Kruja and Kamberi (2020), uses information systems as a competitive advantage tool, focusing on the use of IS in Albanian businesses and its impact on competitiveness. Study results show that there is a significant relationship between firm size and IT/IS usage. At the same time, it has been discovered that while IT/IS usage has an impact on firm competitiveness, cost and product differentiation do not require an IS as a facilitator. Although the findings are notable, the IS in this study focused solely on the communication aspect (kind of information system employed, business communication methods, means of communication within the supply chain, IS-communication impact and online service) and did not cover other IS-related capabilities that may have an impact on competitive advantage.

A more recent model was proposed by Tashtoush (2021), utilizing the Resource-Based View (RBV) framework to explore the mediating role of competitive advantage in the relationship between information systems capabilities and organizational performance. The model specifically examined human resources, software, and hardware as the key IS capabilities. The study findings indicated that information systems

capabilities, competitive advantage, and firm performance exhibited statistically significant relationships. However, it is important to note that this study focused on Jordanian industrial corporations, which raises questions about whether the observed relationships hold true in other sectors. Additionally, it remains unclear whether the relationships between IS capabilities, competitive advantage, and firm performance would be similar in other countries, such as Malaysia. Further research is needed to explore these dynamics in different sectors and international contexts.

Information system capabilities (ISC)

Several previous research has produced a fragmented image of the reasons for IS capability. Some of the structures or elements are constantly intersected and share at least some of their boundaries. IS capabilities, according to Ross et al. (1996), may be defined as the ability to undertake strategically aligned planning, rapid delivery, and cost-effective operation and support. Bharadwaj (2000) defined IS skills as a company's ability to acquire, implement, and exploit IS resources to design and support business strategy and value chain activities. Later, Gu and Jung (2013) defined IS capabilities as the firm's ability to conduct procedures within the IS department, allowing the organization to utilize IS services.

Aydiner et al. (2019) defined IS capabilities as effectively applied categorization and access to knowledge in recent research. They emphasized the need of creating IS skills through a two-way strategy alignment between business and technology. Tangible and intangible resources are combined to form capabilities that allow a company to efficiently deploy resources. The firm's ability to successfully develop and use IT systems is a significant indicator of IS skills, necessitating strategically oriented planning for the speedy delivery as well as cost-effective operation and support (Gu & Jung, 2013). Argyropoulou (2013) claimed that IS is a complex social system that involves people, processes, and business systems to efficiently manage information. Previous studies have mostly focused on the tangible component of IS capabilities, such as IT investment or IT capacity. A previous study has also shown that IS capabilities are linked to resources and competencies. IS capabilities are based on IS resources and IS competencies, which combine to produce a competitive paradigm that equips organizations with knowledge to attain superior performance (Aydiner, 2016; Wang et al., 2015). IS resources are the firm's IT infrastructure that it owns and controls, whereas competencies are the firm's ability to organize, utilize and activate these resources.

This research describes IS capabilities by splitting them into four separate components that encompass both resources and competencies, based on the resource-based view and dynamic capability theory. To reduce the complexity of the constructs, four capabilities discovered and defined by researchers in IS - performance studies are recognized and characterized as ***personnel capability*** (Aydiner, 2016; Aydiner et al, 2019; Bharadwaj, 2000; Cepeda-Carrion, Cegarra-Navarro & Jimenez-Jimenez, 2012; Pérez-López & Alegre, 2012), ***administrative capability*** (Aydiner, 2016; Aydiner et al, 2019; Pérez-López & Alegre, 2012; 0Ravinchandran & Lertwongsatien, 2005; Yeh, Lee & Pai, 2012), ***infrastructure capability*** (Aydiner, 2016; Aydiner et al, 2019; Mithas et al, 2011; Pérez-López & Alegre, 2012) and ***information management capability*** (Brinkhues, Carlos & Macada, 2015; Devece et al, 2017: Khaturia, Saldanha, Khuntia & Rojas, 2016; Mithas et al, 2011; Zhang, Wang & Zhuang, 2017). These domains have been developed and organized to encompass IT infrastructure, human capabilities, and administrative and information management concerns. As a result, in the research, these domains are conceptualized as sub-constructs that form IS capabilities, and they are interlinked rather than hierarchically linked to one another.

Information System capabilities dimensions: personnel capability, administrative capability, infrastructure capability and information management capability

Many studies had viewed *personnel capability* as a potential source of competitive advantage and performance (Al-Karaghouli et al., 2020; Aydiner et al. 2019; Bharadwaj, 2000; Chen, 2012: El-Masri et al., 2021; Gu & Jung, 2013; Khodakarami & Chan, 2020; Mata et al. 1995; Ross et al. 2007; Ravichandran & Lertwongsatien, 2005). For instance, Bharadwaj (2000) who empirically investigated IT capability and firm performance from a resource-based perspective argued that human resources are difficult to acquire and complex to imitate, thus serving as a source of competitive advantage. Also, Chen (2012) in his study specified that human IT resources can generate sub-additive cost and super-additive value synergistic effects on organizational capabilities, therefore are possible sources of sustainable competitive advantages. Following this, Aydiner (2016) also argued that IS staffs are an important element in improving decision-

making capacity and helping to build a sustainable competitive advantage and increase firm efficiency by making better use of company resources and skills. The capacity of personnel contributes significantly to the development of IS capabilities. Tippin and Sohi (2003) state that technical skill sets are necessary for technical operations to complete specified activities at specific performance levels. As a result, personnel capability aims to promote technical capacity and guarantee that it operates effectively and efficiently (Cepeda-Carrion et al., 2012), which may add to a firm's competitive advantage. According to recent research studies, IS personnel capability may be a source of competitive advantage for organizations. Personnel with the necessary skills and experience can optimize information systems, create creative IT solutions, and react to changes in the business environment, resulting in improved performance, creativity, agility, and, ultimately, a competitive advantage (Al-Hawamdeh and Al-Qirim, 2020; Lee et al., 2020; Li et al., 2021).

Administrative capability is considered to be the main driver of IS capability identification and development that is most directly associated with the needs and values of a firm (Wang et al., 2015). Administrative capability is the ability to prepare, coordinate and align business goals towards an effective information system in business processes. Administrative capability should be capable of organizing the finest developing technologies, assessing the demand for technologies, and coordinating with other entities as needed (Chen & Wu, 2011). In relation to the studies, the effectiveness of IT strategy execution has a substantial impact on company performance. For instance, Yeh et al. (2012), in their study posited that organizational competitiveness could be greatly enhanced if the IT strategy could be effectively implemented, thus improving overall organizational performance. According to Mithas (2011), senior leaders need to focus on IT strategy, IT governance, IT resource management and IT investment as key levers for organizational transformation and business excellence. This is later supported by Aydiner (2016) that to carry out administrative duties, leadership is an important element in setting priorities and goals for each of the IS resources and competencies to decide which IS work should be done. Recent studies also suggested that effective information system administrative capability can serve as a source of competitive advantage for organizations. Ghobakhloo et al. (2020) found that effective administrative policies and procedures can enhance innovation performance in SMEs. Goh et al. (2021) demonstrated that effective information system governance, which includes administrative policies and procedures, positively impacted organizational performance. Lee et al. (2020) found that effective administrative policies and procedures positively impacted information quality. As a result, intangible assets of IS-related capabilities, such as administrative capability, are significant components that help to develop a sustainable competitive advantage and enhance company performance by better utilizing an organization's resources and competencies.

The term "infrastructure" relates largely to Information Technology (IT) and is sometimes used interchangeably with the term "IS" in the technology area. IT infrastructure, as one of the firm's most important resources, is a set of common technologies that serve as the basis for all business applications. It is regarded as a key component of a company's structure because it provides the technological framework and service tools required to adapt rapidly to business requirements and changes. IT infrastructure is defined by Pérez-López and Alegre (2012) as the resources, assets, and technologies that contribute to the collection, creation, storage, distribution, and use of information. These technical capabilities enable a company to expedite important business efforts, hence impacting the firm's performance (Aydiner et al., 2019). Flexible IT architecture positively improves IS capabilities by enabling a network system for communicating with other systems and offering a platform for obtaining important data. To correspond with the business's strategy and goals, all sections of a firm must adapt and integrate the IT infrastructure. As a result, infrastructure is an essential component of IS capabilities, allowing a business to reach every location and span the breadth of the firm's borders (Mithas et al., 2011). Aydiner (2016) observes that competitive businesses can replicate one other's IT infrastructure, but when the IT infrastructure is turned into IS infrastructure capability, which is the specific capacity to support IS capabilities, it becomes a rent-yielding resource for a firm. Recent studies have found that having such infrastructure capability can lead to several competitive advantages. For example, Kim et al. (2021) found that having a robust and flexible information system infrastructure can enhance an organization's agility, allowing it to quickly respond to market changes and seize new opportunities. Similarly, Ho et al. (2021) found that having an advanced and well-integrated information system infrastructure can improve an organization's overall performance. Chen et al. (2020) also found that having an advanced and interoperable information system infrastructure can enhance supply chain integration, leading to a competitive advantage. Therefore, organizations that invest in developing and

maintaining their information system infrastructure capability can gain a competitive advantage in today's rapidly changing and highly competitive business environment.

Information management capability refers to a firm's ability to effectively manage both internal and external information. Information management is the final objective of information technology and is recognized as a key benefit of IS capability. Information management involves a combination of automation, organization and processes. It is considered to be one of the firm's most important resources and is critical to the achievement of organizational outcomes (Steventon et al. 2012). Scholars such as Inkinen et al. (2015) emphasized this point by describing how organizations utilize information technology to search for, acquire, and evaluate data to improve decision-making and performance. Knowing how to harness the power of information ubiquity and apply the smaller subsets relevant to the organization, goods, and consumers at a certain point in time will be crucial to identifying new possibilities and avoiding hazards (Hazzaa, 2018). As a result, information capability is most prevalent among firms that are devoted to quality management (Suárez et al., 2014).

According to Zárraga-Rodrguez et al. (2014), an organization has information capacity when the use and management of information are so efficient that it provides a competitive advantage to the organization. This capability may be broken down into a variety of real and observable practices that entail effective information management and use. These are the capabilities of information management, information technology, and information culture. Andrade Rojas et al. (2014a) posit that IMC complements firms' internal resources such that firms can attain a better position in competitive networks. IMC is also a manifestation of firms' ability to manage information and IMC functions as either an antecedent of other organizational capabilities or as a complement of firm resources. Recent research has shown that effective information management capability can be a source of competitive advantage for organizations. Kim and Kim (2020) found that effective information management capability, including data quality, data governance, and data analysis, positively impacted firm performance. Qian et al. (2021) demonstrated that information management capability, including information quality, information use, and information sharing, positively impacted organizational innovation. Huang and Li (2021) showed that information management capability, including data sharing, data integration, and data security, positively impacted supply chain management. These studies suggest that effective information management capability can help organizations achieve greater firm performance, innovation, and supply chain management, ultimately leading to a competitive advantage. Therefore, investing in information management capability can be a strategic move for organizations to gain a competitive edge.

Sustainable competitive advantages

Sustainable competitive advantages are the key dependent variable of interest in this study. To remain in today's dynamic global business climate, organizations must not be satisfied with a competitive edge but must continue to improve and evolve. By this, Young (2015) emphasizes the relevance of a firm's capability to continuously create above-average market returns and to regularly outperform its competitors in terms of business performance. He sees them as two significant indicators of a firm's long-term competitive advantage. For example, Zairi (2005) argues that to survive and maintain a competitive edge in today's economic climate, an organization must constantly improve.

Similarly, Porter (1990) claimed that the only way to achieve long-term competitive advantage is to improve competitive advantage. According to Aras and Crowther (2010) and Liu (2013), only successful organizations have a continuous competitive edge. A sustainable competitive advantage is described as a capacity to create internal foundations and procedures that encourage organizational personnel to generate unique capabilities, allowing the firm to adapt to changing strategies and consumer needs (Ulrich and Lake, 1990). Similarly, Barney (1991) claimed that to maintain a competitive advantage, an organization must pursue tactics that maximize its internal strengths. The company should capitalize on environmental possibilities, mitigate external dangers, and avoid losses caused by internal flaws. Furthermore, he contended that organizations with a value-creation strategy had a sustainable competitive edge over their competitors. Such businesses attempt to multiply the benefits of such an approach.

According to Aras and Crowther (2010), a sustainable competitive advantage consists of four components: profitability, sustainability, corporate reputation, and good governance. Profitability is defined as an

appropriate return for the degree of risk incurred. Sustainability is concerned with the impact of current actions on future alternatives. Corporate governance is the process of striking a balance between a company's economic and social aims, such as its behavior in its social context. Finally, company reputation is an intangible aspect that is frequently the most essential factor in acquiring a competitive advantage as well as financial and social success. Each of the four elements is critical to business success, but they only provide outstanding results when integrated, hence they should be regarded as the foundation of any organization's SCA.

IS has improved business performance by enhancing effectiveness and efficiency (Dehning & Stratopoulos, 2003; Hevner, March, & Park, 2004). IS may be utilized to generate long-term competitive advantages by harnessing unique company features. Previous research indicated that firms may increase firm performance by lowering costs and delivery times while improving customer service and dependability through ICT deployment (Daneshvar Kakhki & Gargeya, 2019). As a result, the potential of IS to improve management decision-making capabilities and productivity by implementing enterprise resource systems, supply chain collaboration support systems (Hadaya & Cassivi, 2012), and social reference systems to support sustainable social commerce sales have also been investigated (Lee, Lee, & Oh, 2015). In summary, a long-term competitive advantage is required for continued higher performance. Firms must differentiate themselves and seek a premium price structure (Bharadwaj et al., 1993). The research also argues that information systems include important procedures that assist organizations in gaining and maintaining a competitive edge.

Despite several research studies on the firm competitive advantage, relatively few have explored the function of bureaucracy as a factor that may affect a firm competitive advantage, particularly in the Malaysian setting. The core ideas of bureaucracy have been attempted to be constructed in a broad range of publications (Damarin, 2015; Torstendahl, 2015). Previous research has indicated that additional critical research is required to analyze the bureaucratic procedure between corporate operations in Malaysia. Long and time-consuming administrative processes, it is suggested, pose significant problems to Malaysian business management (Harun et al, 2016). According to the Global Competitiveness Report 2017-2018, ineffective bureaucracy is one of the most troublesome factors faced by Malaysian businesses. Despite considerable government attempts to mend this unfavorable image, bureaucratic efficiency rankings remain low, which leads to confusion, risk, and insecurity (Haryono & Khalil, 2011). Furthermore, few studies have been conducted on the link between long-standing bureaucracy and technology (Kim, Paik, & Lee, 2014). Several research studies examined the influence of information systems on organizational efficiency in the short term (Dewett & Jones, 2001; Heintze & Bretschneider, 2000; Igbaria, Zinatelli, Cragg, & Cavaye, 1997; Iivari, 2005; Kositanurit, Ngwenyama, & Osei-Bryson, 2006). Meanwhile, several other studies had also investigated IT's long-term impact on bureaucratic structure (Bovens & Zouridis, 2002; Daft, 2004; Dewett & Jones, 2001; Moon & Bretschneider, 2002; Taylan, 2010; Welch & Pandey, 2006). None of the aforementioned studies discusses the bureaucracy's response to IS and surprisingly, very little study can be found that showed empirical results of such a link between bureaucracy and sustainable competitive advantages of a firm.

Proposed Research Model

To further expand the knowledge in IS discipline, an attempt is made to develop a model to examine the key factors (including the IS capabilities of the firm) that could affect the firm's competitive advantage. The proposed model consists of six major domain constructs; (1) personnel capability, (2) administrative capability, (3) infrastructure capability, (4) information management capability, (5) moderator and (6) firm's sustainable competitive advantage.

Figure 1: Proposed Research Model



3. Research Methodology

This study proposed to explore the effect of information system (IS) capabilities on sustainable competitive advantages in its research setting in which the unit of analysis is at the organizational level. The study is conducted on the Malaysia Government Linked Companies (GLCs) both at the states and federal levels. Data will be gathered through personal interviews as well as a questionnaire survey. Before developing the questionnaire, personal interviews are conducted to extract pertinent additional aspects of the local environment that affect the firm competitive advantage. To create the questionnaires, elements derived from interviews will be combined with factors derived from the literature. The proposed study will use structured questionnaires as the primary mode of data collection and will use an online distribution technique. The online distribution approach was chosen since it allows for greater geographical coverage of responders. When compared to the personal interview approach, it will also minimize interviewer biases. The study makes use of a list of GLCs in Malaysia acquired from various online websites. Accordingly, there are 462 GLCs listed in Malaysia, including federal-states owned GLCs (Arumugam et al., 2011; Kadir, Abidin, Ramli, & Surbaini, 2014; Said & Jaafar, 2014), however, 455 GLCs are considered residents for the research owing to mergers and acquisitions (Nik Herda, 2019). Purposive sampling will be used in the study. Purposive sampling is used since the characteristics of respondents in this study will be determined depending on the position they occupy. The research participants have to be medium or large companies having at least 20% government ownership (Nik Herda, 2019; Razak, Ahmad, & Joher, 2011; PCG, 2006). As a result, small-scale and micro-level firms have been phased out. The surveys' targeted respondents were senior and executive managers or mid-level managers with relevant knowledge of IS capabilities as well as knowledge of the organization as a whole.

4. Managerial Implications and Recommendations

The dynamic capabilities theory (Teece et al, 1997) will serve as a guide for this research, with the ultimate objective of developing an alternative model and contributing to the area of information systems management. First, several studies have investigated the effects of information systems on firm performance (Aydiner, 2019; Brinkhues, Carlos, & Macada, 2015; Carmichael et al., 2011; Devece et al., 2013 & 2015; Hazzaa, 2018; Kathuria, 2017; Mithas et al., 2011; Tippins & Sohi, 2003), very few studies have considered the interactions or combinations of resources and competencies as capabilities or most studies had only considered these factors in isolation, thus the findings are often conflicting and provide inconclusive evidence.

Despite multiple research on IS and firm results, there has been little consensus on how IS capabilities contribute to a firm's competitive advantage. Taking this into consideration, the current study seeks to investigate the impact of IS capabilities (personnel capability, administrative capability, infrastructure

capability, and information management capability) on a firm competitive advantage to create a broader view of the ability of the combinations of resources in firms to promote superior performance as well as to shed some light on why previous study findings have been inconsistent.

Several researchers also looked at other factors and suggested that these factors have an impact on IS and organizational results to some extent (Harun, Saud, Isa & Hussain, 2016; Kim et al, 2014). One key factor is bureaucracy. There have been numerous studies concerning bureaucracy and firm performance, however, limited studies can be found to have examined the bureaucratic characteristics within the context of Malaysian GLCs. Previous research has also highlighted that more critical research is needed to explore the bureaucratic process in Malaysian business operations. Long and time-consuming administrative processes, it is suggested, pose significant problems to Malaysian corporate management (Harun et al, 2016). As a result, the relationship between the moderating variable is a critical gap that will be filled by this study. The knowledge of the impact of bureaucracy as moderating factor in assessing the effect of ISC and a firm's competitive advantage will be the extension of the theory from this study.

The proposed study will be able to give policymakers relevant guidance for administering GLCs by the National Policy on Industry 4.0 migration. Furthermore, it will give guidance on how firms may adopt information management programs to increase the efficiency and usage of IS in business routines, processes, and personnel. Furthermore, the survey items developed by the study are intended to contribute to the body of knowledge that is unique to Malaysian GLCs. The proposed study will also contribute to the information system literature by adding bureaucracy and utilizing the dynamic capability theory, which will be tested empirically on Malaysian GLCs.

5. Conclusion

The purpose of this article was to create a framework for future research on firm information system capabilities and sustainable competitive advantages among Malaysian GLCs. Firms must provide specialized services and establish a creative strategy that takes advantage of emerging technology, particularly the information system (IS), to remain competitive. Many firms require innovative use of information systems (IS) to ensure their survival and success. These technologies enable businesses to identify the beneficial effects of information systems as a method of achieving high-quality performance. The essential challenges that most modern organizations confront are high-quality performance, dependability, and profitability. As a result, information system capabilities are becoming an important strategic component that aids in the creation of competitive advantages and promotes organizational survival.

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