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Research Article

The utilization of Cloud Computing Services (CCS) in Achieving Competitive Advantages among MD Status Company: A Conceptual Framework

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ABSTRACT

The integration of advanced technologies, particularly cloud computing services (CCS), has intensified competition across various business sectors as organizations strive to meet the ever-changing demands of their customers. Organizations are increasingly utilising CCS to gain competitive advantages, a trend that is becoming widespread. However, organizations with insufficiently skilled employees may find it difficult to fully utilise the capabilities of cloud technology, which could put them at a competitive disadvantage. This paper aims to explore the connections between the mediating role of information system (IS) processes and the factors involved in achieving competitive advantages through CCS. IS processes will act as a mediator between the adoption of cloud technologies and their successful integration into organizational workflows, influencing efficiency, decision-making, and value generation. This study concentrates on several practical strategies for leveraging CCS to achieve a competitive advantage. These include training and developing employees' skills, exploring how organizational culture affects the use of cloud technology, and creating metrics or models to measure how CCS help create measurable competitive advantages.

Keywords: Competitive advantages, cloud computing services, MD Status Companies, information system process.

INTRODUCTION

The investigation into how implementing cloud computing services (CCS) can contribute to the strategic advantage of business organizations has become an important topic within information systems (IS) research. To gain a competitive edge, it's essential to provide added value and build strong customer relationships [1]. Lower prices or cost-effective product and service differentiation are two ways to achieve this, both of which will result in improved performance [2]. Integrating CCS technology allows organizations to streamline operations, boost productivity, and improve the overall value proposition for their customers. By strategically using technology, organizations can maintain a competitive edge and adapt to changing market demands. Staying ahead by embracing the latest advancements ensures continued success and growth in today's fast-paced business environment.

Achieving competitive advantages relies heavily on strong support from management and technical teams [3][4]. To leverage CCS effectively, organizations must recruit and retain skilled professionals to manage these services. Competent team members are crucial for handling both managerial and technical responsibilities [5]. Effective collaboration between leadership and technical teams enables businesses to maximize CCS benefits, leading to greater operational efficiency, cost savings, and a stronger market position. Conversely, a lack of skilled staff can hinder organizations from fully exploiting cloud technology, placing them at a disadvantage.

The impact of CCS on competitive advantage is analyzed through various theoretical frameworks, including the Resource-Based View (RBV), Porter's Competitive Advantage Model, the Technology-Organization-Environment (TOE) Framework, and the Process IT/IS Infrastructure Model. The Resource-Based View believes that organisations can achieve lasting competitive advantage by using valuable resources such as modern technology and competent employees. Meanwhile, Porter's approach highlights cost leadership, quality of product and product or service differentiation, which CCS can supports by reducing the costs. The TOE framework posits that the utilisation of CCS are influenced by the interplay between technology, organisation, and environmental factors, while the Process IT/IS Infrastructure Model highlights the need of a strong IT infrastructure for efficient CCS integration. The integration of various theoretical perspectives, frameworks, and models will enhance the understanding of how CCS may promote organisational success and sustained competitive advantage in the modern business environment.

Recent studies on achieving competitive advantages often focus on implementing CCS. However, an extensive review of the literature reveals that there is limited research specifically on using CCS to gain a competitive edge. This research highlighted a lack of studies examining the roles of skilled management and technical teams, which can be combined into a single concept called "information systems (IS) processes." Effective collaboration after implementing these systems is essential to keep them functional and aligned with organizational goals, adapting to changes as needed [6]. It remains uncertain whether the mediating role of "information system processes" can significantly help achieve a competitive advantage through CCS.

This study proposes a research framework that connects the mediating role of information system (IS) processes with the factors involved in gaining competitive advantages through CCS. It begins with an introduction that provides the research background, highlights the importance of CCS in achieving competitive advantage and outlines the study's objectives. The literature review identify relevant theories, frameworks, and models, analyzing how CCS utilization and organizational factors influence the organization success. A research framework is proposed, comprising independent variables (technology, organization, and environment), a mediating variable (information systems process), and a dependent variable (competitive advantage). Finally, the discussion and conclusion section summarizes key findings and offers directions for future research on CCS and its role in enhancing competitive advantage. The combination of different theoretical perspectives, frameworks and models will enhance the examination of how CCS can foster organizational success and sustainable competitive advantage in the contemporary business landscape.

THEORETICAL FOUNDATION

Most of the research has been undertaken using various models to study how different types of information technology are adopted and utilised in businesses *[7]*. Some research examines the adoption and utilisation of new technologies using the TOE Model, which identifies the most important factors influencing their use *[8]*. However, the researcher found that the TOE model is frequently regarded as a key indicator in the adoption and utilisation of CCS

A. Resource Based View

The Resource-Based View (RBV), first proposed by Wernerfelt in 1984 and subsequently refined by Barney in 1991, is a strategic management theory that highlights the significance of an organization's resources in attaining a sustainable competitive advantage [9] [10] [11]. According to RBV, resources must possess value, rarity, inimitability, and non-substitutability (VRIN) to offer a sustainable competitive advantage in the marketplace [12]. Resources may be categorised as tangible, such as physical assets, or intangible, such as knowledge, skills, and organisational capacities [13][14]. RBV highlights the significance of internal resources, including research and development (R&D), brand management, and efficient operations, with external resources like supplier collaborations and technical innovations, in facilitating organisational success.

Since this research is on how MD status organisations may maximise the advantages of CCS by using both physical and intangible resources, RBV is an ideal fit. Intangible resources, including managerial capabilities and technical expertise, are essential for the efficient implementation and management of CCS, while physical resources, such as IT infrastructure, improve operational efficiency [12] [14] [15]. The theory corresponds with this study by highlighting the strategic importance of these resources in establishing product/services differentiation, cost advantages and quality of product, allowing organisations to acquire and maintain a competitive advantage. This research assesses

how MD status organisations may use their distinct capabilities to maximise CCS utilisation and enhance overall performance in a competitive setting by using RBV.

B. Porter's Model

Porter's model, introduced by Michael E. Porter in 1985, outlines the main strategies that organisations can employ to achieve a competitive advantage. Porter's model outlines three main approaches: cost leadership, in which organisations strive to provide products or services at reduced costs, differentiation, where companies set themselves apart by offering unique and high-quality products and focus, where orgaization can offering a specialized service in a niche market[16] [17]. This approach seeks to enhance organisational effectiveness and strengthen market standing. Porter's model highlights the critical need for organisations to align their strategies with operational capabilities, allowing organisations to meet customer demands effectively and maintain a competitive edge in dynamic markets [18] [1] [16]

This study utilises Porter's model to examine how companies with MD status can harness CCS to gain a competitive advantage by focussing on cost savings, product/ services differentiation and quality of product. CCS facilitates cost leadership through the reduction of operating expenses, enhancement of efficiency, and the promotion of economies of scale. It also enhances differentiation by elevating product quality and establishing a distinctive value proposition for customers. This model holds significant relevance as it corresponds with the study's emphasis on utilising CCS to enhance operations and cultivate strategic advantages, assisting MD status companies in sustaining their competitive edge in a swiftly evolving landscape.

C. Technology-Organization-Environment (TOE) Framework

The Technology-Organization-Environment (TOE) Framework, developed by Tornatzky and Fleischer in 1990, categorises three factors that influence technological adoption: technology, organisation, and environment [19]. The technological factor explores the features and characteristics of the technology aspects such as compatibility, security & privacy concern, and relative advantage [20] [21] [22] [23] [24]. The organization factor focuses on internal dimention like top management support and IS competence, which are essential for effective technology adoption, both of which are crucial for the successful adoption of technology [25] [26]. Meanwhile the environmental factor considers external dimension, including competitive pressures, government support, and external support, such as help from technology vendors or consultants [21] [27] [24] [23] [28] [29] [26] [20]. Collectively, these variables offer a systematic framework for comprehending the factors that facilitate and hinder the adoption of technology.

The TOE framework is well-suited for this study, providing a thorough model for examining the adoption of cloud computing services (CCS) in companies with MD status. This aligns with the study's focus by examining essential elements such as CCS compatibility, organisational readiness, and the external pressures stemming from competition and regulation. The framework highlights the importance of top management and information systems competence, which are crucial for the effective adoption and use of CCS. By considering the impact of these three factors, researchers can identify potential benefits and risks associated with using CCS, develop strategies to mitigate those risks, and capitalise on the benefits.

D. IT Infrastructure Flexibility Model

The model employed in this study has been adopt and adapt from various prior research studies Researchers such as Fink and Neumann (2009), Byrd and Turner (2000), and Weill et al. (2002) have contributed to the development and enhancement of the Process IT Infrastructure Model. This model highlights the significance of IT and IS infrastructure in allowing organisations to attain strategic objectives via improved operational flexibility, efficiency, and responsiveness. The approach emphasises two primary dimensions: range physical capabilities, including hardware, software, and network systems, and range managerial capabilities, comprising skills, knowledge, and leadership in the management of IT/IS resources. These factors allow organisations to synchronise technology capabilities with strategic goals, fostering sustainable development and competitive performance.

This model is particularly relevant to this study, as it examines how MD status companies can leverage IT/IS infrastructure to optimise CCS. The range of physical capabilities dimension matches the need for a strong IT infrastructure to make CCS deployment easier, while also ensuring security, scalability, and smooth integration. Meanwhile, the range management capabilities dimension underscores the significance of proficient teams and strong leadership in overseeing CCS processes and aligning them with organisational objectives. This model figures

out how the interaction between IT infrastructure and management knowledge affects how well CCS is put into place and how it helps get a competitive advantage.

RESEARCH FRAMEWORK

The proposed research framework, as depicted in Figure 1, serves to examine the relationship between information system (IS) processes acting as mediators in the pursuit of competitive advantage in the utilization of CCS. The framework was developed by drawing upon the findings and insights from several prior studies, including those conducted by [26] [28] [30] [20] [31] [32] [15]. The dependent variable in this study is the competitive advantage in using CCS, which is measured by examining three dimensions: product/service differentiation, cost leadership, and quality of product. According to our research, the mediating variable in this study is the information system (IS) process. This process encompasses a range of managerial capabilities and a range of physical capabilities. These capabilities play a crucial role in facilitating the mediation between the independent and dependent variables in our research. The independent variable in this study comprises three different variables: technology, organization, and environment. The technology variable encompasses dimensions such as compatibility, security and privacy, and relative advantage. The organization variable includes top management support and organizational information systems (IS) competence. Lastly, the environment variable encompasses competitive pressure, external support, and government support.

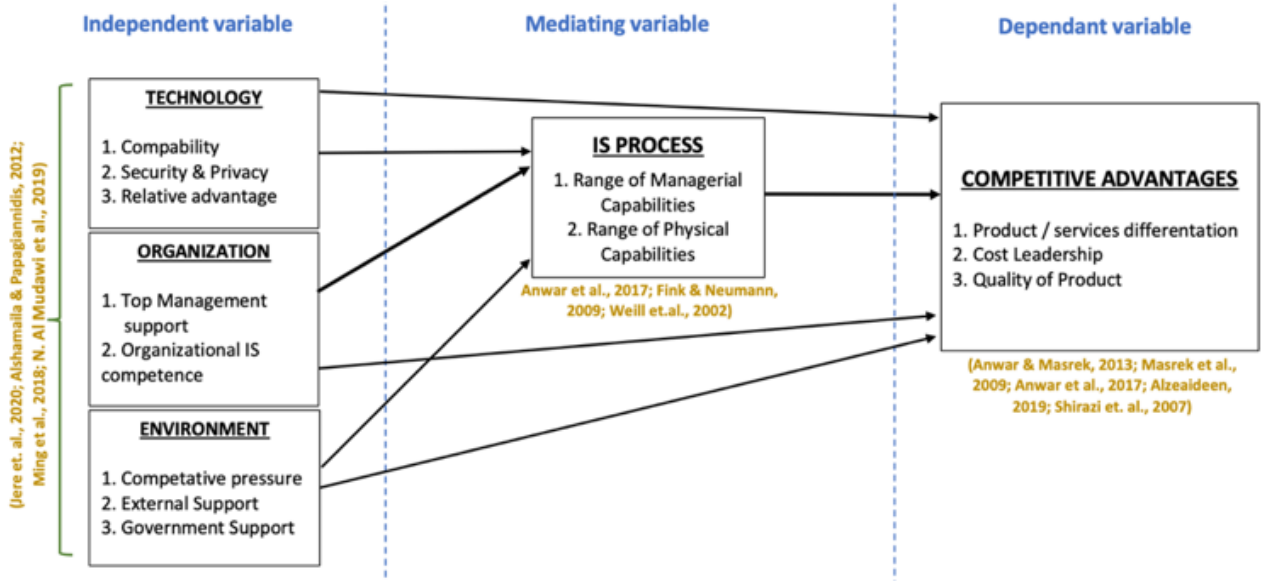

Fig. 1: Conceptual Framework

A. Competitive Advantages

Competitive advantage is an important component of an organization's performance since it indicates its capacity to outperform competitors while producing goods or services. This greater performance translates into increased profitability and value generation for the organization and its stakeholders. A competitive strategy is a complete framework that defines a company's approach to competition, objectives, and strategies for achieving those objectives. Understanding competitive advantage is critical for a company's success because it seeks market dominance and increased profitability [33, 34]. In today's competitive market, organizations must negotiate complex demands, meet customer needs, and maintain their market leadership [35]. The advancement of ICT has resulted in the creation of tools like CCS, which can improve productivity, optimize operations, and cut costs.

B. Product / Service Differentiation

Product or service differentiation refers to the strategy employed by an organization to provide a comparable product or service that is already present in the market, but at a reduced cost, while yet keeping superior quality compared to the existing alternatives. By implementing CCS, organizations can efficiently manufacture both new and existing products or services while maintaining superior quality and minimizing expenses [36]. CCS is an invaluable tool for organizations to augment their competitive advantage [37]. Through the formulation of efficient strategies,

organizations can devise products or services that not only cater to customer demands but also distinguish themselves from rivals. Implementing CCS can enhance efficiency and production, resulting in enhanced overall market performance [38]. By employing this strategic strategy, organizations can effectively adjust to shifting market conditions and maintain an edge over their competitors.

C. Cost Leadership

The cost leadership strategy, as conceptualized by Michael Porter, is a prominent component of his Generic Strategies framework. This strategy holds the potential for application across diverse product and service offerings, spanning various sectors and organizations of varying scales. Organizations that embrace a cost leadership strategy typically prioritize the management of costs, optimization of operations, and attainment of economies of scale to curtail production costs. This enables them to provide products or services at a more affordable price compared to their rivals. In addition, it is worth noting that organizations with substantial purchasing power have the potential to engage in negotiations with suppliers and vendors, resulting in the possibility of obtaining lower prices. This, in turn, can contribute to the reduction of production costs and facilitate the ability to provide products or services at a more competitive price point.

D. Product of Quality

Product quality is an important determinant of customer satisfaction and loyalty. By consistently delivering high quality products, an organization can build a strong reputation and differentiate themselves from competitors (Gebauer, Gustafsson, & Witell, 2011). Investing in quality control measures and continuous improvement processes can help ensure customers receive a reliable and superior product. CCS can improve product quality for an organization by enabling real-time data processing, seamless updates and robust performance (Umar & Rana, 2024). For MD companies, ensuring reliability and superior functionality through CCS strengthens customer trust and strengthens their reputation in a competitive market

E. Information System (IS) Process

The role of IS process, encompassing management and physical capabilities, plays a crucial role in facilitating the connection between technology, organization, environment and the achievement of competitive advantages through CCS. By effectively combining managerial capabilities with physical management capabilities, organizations can successfully implement, manage, and maintain CCS, thereby gaining a competitive edge [15] [32]. IS process refer to the organised activities and capabilities within an organisation that enable the efficient utilisation and control of technology, organisasi and environment. The integration of these processes is critical for the successful adoption and utilization of CCS, as they ensure that the technology, organisation and environment aligns with the organization's strategic goals and operational needs [39]. The extent to which CCS provides a competitive advantage depends on how well these processes are managed and integrated within the organization.

F. Technology

Technology is a crucial independent variable that highlights the impact of technical elements on organisational procedures and results. The technological capabilities of CCS and the organisation's capacity to take advantage of those capabilities are included in the category of technology factors. The compatibility, security & privacy, and relative advantages of CCS are a few examples that fall within this category.

Compatibility

Compatibility refers to the degree to which a technology, such as CCS, is seen as consistent with the established values, prior experience, and needs of an organization [40]. This means that the technology is easily accepted and integrated into the company's operations based on previous experience and current needs [40]. Compatibility also refers to the company's ability to use and combine new technologies effectively, take advantage of past usage patterns and meet current needs [41]. Therefore, in the scope of CCS, compatibility is an important determinant for the successful integration and use of new technologies in achieving organizational operational effectiveness.

Security & Privacy Concern

The utilization of cloud computing and internet services in diverse domains, such as e-government and e-business, is subject to a multitude of concerns pertaining to security and privacy [42] [43] [44]. The aspects encompass data

protection, the prevention of unauthorized access, and the assurance of privacy and auditability. These elements are of utmost importance in cultivating trust and facilitating the expansion of CCS technology.

Relative Advantage

The concept of "relative advantage" pertains to the perceived advantages that an organization can acquire through the adoption of novel approaches to task completion, as compared to previous methods [45] [46]. The concept of relative advantage pertains to the degree to which a novel innovation is perceived as surpassing existing methods in terms of performance, efficiency, and effectiveness. Our research findings indicate a noteworthy positive correlation between the perceived proportional advantage and the probability of businesses adopting CCS technology. Therefore, the utilization of CCS in an organization is more probable when they perceive a higher relative advantage. The findings suggest that the perceived advantages of CCS technology hold significant influence in the decision-making process of businesses when considering the implementation of this technology.

G. Organizational

Organisation is another independent variable that captures the internal elements shaping the adoption and successful implementation of CCS. It reflects an organisation's readiness, infrastructure, and human resource capabilities, which directly influence its ability to utilise CCS effectively. This variable emphasises the importance of leadership, skills, and institutional processes in leveraging CCS to achieve strategic and operational goals, making it a cornerstone of organisational competitiveness.

Top Management Support

The presence of top management support in an organization is very important when considering the successful adoption, implementation and continued use of CCS in terms of decision-making, validation and dedication shown by top-ranking executives. Also, it is important because it will involve the allocation of resources for the purpose of implementing and managing organizational change. Based on various studies conducted, it was found that the presence of top management support plays an important role in facilitating the successful use of CCS [28] [47] [48] [49].

Organizational IS Competence

Organizational IS competence refers to the level of expertise and knowledge in the organization in using information systems effectively which includes technical knowledge, skills and the ability to adapt to new technologies. Organizations have the potential to experience great advantages by allocating resources towards developing IT competencies [50][51] [52]. Through improving the efficiency of their organization's information systems (IS), organizations have the potential to optimize their operational efficiency, improve their decision-making capabilities, and ultimately gain a competitive advantage in the marketplace.

H. Environment

Environment is also an independent variable that refers to external factors and conditions that influence an organisation's ability to adopt and utilise CCS. These factors exist outside the organisation but have a significant impact on its decision-making and operational efficiency. By accounting for environmental dimensions, the framework acknowledges that external pressures, support systems, and market dynamics play a crucial role in shaping an organisation’s competitive advantages through CCS.

Competitive Pressure

A company is under "competitive pressure" when it frequently experiences pressure from its rivals. It is prevalent in all types of economies. Competitive pressure can refer to the degree of pressure experienced by organisations to raise demand by effectively serving customers (Awa & Uojiabo, 2015). Competitive pressure can also be referred to as the degree of pressure that a company experiences from competitors operating in the same industry [47]. Therefore, competitive pressure can be described as the level of pressure that organisations face from rival enterprises operating in the same or similar industries to gain a competitive advantage. It is motivated by the necessity to effectively serve customers while keeping up with competitors' innovations. Competitive pressure is the level of competition that an organization has from competitors in the same business or sector, and it motivates businesses to enhance their offerings to remain competitive and attract customers.

External Support

External support in the context of CCS refers to the help and resources that organizations receive from outside sources, such as IT/IS vendors, consultants, or cloud service providers. This support is crucial for ensuring that organizations can effectively implement and utilise CCS. External support provides the necessary expertise and guidance during the utilization process, helping organizations get the most out of their CCS investment. It can also be defined as the extent to which using a specific ICT is seen as more beneficial for job performance compared to other technologies [53]. By leveraging external support, organizations can overcome challenges, minimize risks, and ultimately achieve greater success in adopting and using their CCS.

Government Support

Effective government support can help organization overcome various challenges in an uneven market. Additionally, government support is crucial for the use of CCS, especially in education, health, and economic sectors. Proper support from the government can help organization tackle internal obstacles, encourage formalization, and promote the utilization of CCS. However, inadequate government support can negatively affect market structure and disrupt market efficiency [54]. This concept highlights the vital role of government in helping businesses improve their competitiveness through financial aid, service facilities, training and educational resources, and infrastructure support, thereby enhancing the quality of their work and services.

DISCUSSION AND CONCLUSION

The goal of this research framework is to apply it to Malaysian Digital (MD) status companies, particularly those located in the Klang Valley region of Selangor and the Federal Territory of Kuala Lumpur, who are using CCS to gain a competitive advantage. The researcher analyzed the effects of CCS on operational efficiency, innovation, and market competitiveness, with a focus on the Malaysian business and technology context. The framework aims to offer insights relevant to other emerging economies or sectors shifting to cloud-based solutions. This research framework provides substantial contributions for future studies and practical applications. This enhancement of the Technology-Organization-Environment (TOE) framework theoretically incorporates Information Systems (IS) processes as a mediator, offering a more profound understanding of the role of cloud computing services (CCS) in fostering competitive advantage. Practically, it serves as a valuable tool for MD Status companies, enabling them to evaluate their technological capabilities, organizational readiness, and environmental factors, thereby enhancing the utilization of CCS and achieving performance improvements. The framework establishes a foundation for future research by providing a model that can be tested and expanded across various industries, regions, and technologies, including emerging innovations such as AI, IoT, and blockchain, thereby maintaining its relevance in a changing digital environment.

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