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Knowledge Asset as an Antecedent of Competitive Advantage: A Review of Literature

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Abstract: *It is now commonly recognized that the effective management of knowledge assets is a key obligation for securing sustainable competitive advantage in any economy. The physical as well as institutional differences between tangible assets and knowledge assets remain least understood. In the case of knowledge, the control and ownership of assets are becoming increasingly separable, a phenomenon that is really aggravated by the phenomenon of learning. If we are to meet the challenges of the information economy, then there is need for a new approach to property rights based on a deeper theoretical understanding of knowledge assets. The study entails conceptual literature, theoretical literature, empirical literature as well as proposed theoretical model. The purpose of this study is to review existing conceptual, theoretical and empirical literature on knowledge assets and competitive advantagewith a view to highlighting the knowledge gaps suitable to form basis for future research work. Existing empirical literature on knowledge asset used different research methodologies creating methodological gaps hence coming up with different outcomes. Further, the few empirical studies that have been conducted to examine the linkage between knowledge asset and competitive advantage have been conducted in developed countries hence diversity of contextual variables. The review also revealed that until now prior research has given little guidance of how knowledge assets interact with each other. From the reviewed literature, a set of relationships for the dimension of knowledge asset and competitive advantage were modeled as a guide for future research work in the field of strategic management.*

Keywords: *Knowledge Asset, tangible Assets and competitive Advantage*

1. Introduction

Competitive advantage is a condition that puts a company in a favorable or superior business position (Capon, 2014). The law of competitive advantage has raised considerate interest among various scholars especially in the 1980s. According to Box and Miller (2018), the competitive global business strategies should be based on competitive advantage of differentiation, unique specialization in terms of quality, product, service, technology or cost leadership. Perrot (2019) introduced the notion of excellence, the continuous pursuit of improvement which provides the basis for a unique competitive advantage. Peters (2018) asserts that excellence in performance is essential for sustainable competitive advantage. Ireland, Hoskisson and Hitt (2019) strongly recommend a high level of involvement by manufacturing managers in the strategic planning process of business units for the attainment of superior competitive performance. According to Porter (1985), the two basic type of competitive advantage (low cost and differentiation) combined with the scope of activities for which a firm seek to achieve them lead to three generic strategies for achieving above average performance in an industry; cost leadership, differentiation and focus. According to Hill and Jones (2009), a firm has a strong competitive advantage if it has a continuously higher operating performance than its competitors.

First introduced in 2003, the term knowledge asset refers to an organization’s accumulated intellectual resources (McInerney & Koenig, 2011). Knowledge assets include information, learning, ideas, understanding, insights, memory, technical skills, and capabilities. Knowledge assets reside in documents, databases, software, patents, policies and procedures. He observed that Information and knowledge assets are the know-how an organization taps into to invest and grow. Proper knowledge asset management is key to creating value for stakeholders and sustaining organizational performance (Boisot, 2009).

Knowledge assets represent the fount of an organization's competences and capabilities that are deemed essential for its growth, competitive advantage and human development (Kamaşak & Yücelen, 2016). Nonaka *et al (*2000) regard the knowledge assets as the basis of knowledge-creating process and define them as "firm-specific resources that are indispensable to create values for the firm". In order to make use of knowledge assets and to manage knowledge creation and exploitation effectively organizations must be able to identify and quantify these resources. Hence, a company has to map its stocks of knowledge assets while keeping in mind that they are dynamic, and new knowledge assets can be created from existing ones (Nonaka et al., 2000). Knowledge assets include both tangible and intangible assets that are the source of a firm's competitive advantage. Tangible knowledge resources of a firm usually mean documented or codified knowledge which is relatively easy to convey to other people or organizations, if only they have an understanding of that knowledge (Saviotti, 2017).

Intangible knowledge resources are usually described as tacit knowledge and are relatively difficult to communicate to other people or firms (Agrawal, 2018). Tacit knowledge is not only difficult to document but also difficult for competitors to imitate because of the unique characteristics that only the organization has. Therefore, tacit knowledge allows the firm to maintain its competitive advantage for a long time. The knowledge assets possessed by the firm are its core competencies, and they are central to establishing an efficient and systematic knowledge base system in the organization. Therefore, the successful performance of a firm is determined by the management and utilization of the firm's knowledge resources (Alegre, Sengupta, & Lapiedra, 2017; Pater & Lewandowska, 2018; Zhao & Sheng, 2019).

Knowledge only becomes truly valuable when it is well-managed (Nonaka & Takeuchi, 1995). Together with promoting growth and competition, the sharing and use of knowledge within an organization lead to benefits like: improved strategic decision-making, better-informed policies and procedures, greater cost-effectiveness, increased employee engagement and innovation, and improved documented knowledge asset flow across organizational boundaries. It also allows employees to share their collective wisdom, experience, and expertise to make their own work more efficient (McInerney & Koenig, 2011).

Understanding internal sources of competitive advantage has become a major area of research in strategic management. Strategic management is a set of managerial decisions and actions that determines the long-run performance of a corporation. Resources are a business's tangible and intangible assets, capabilities are the ability to exploit its resources, and competency is a cross-functional integration and coordination of capabilities (Hunger & Wheelen, 2011). Close, trusting, and high-quality inter-firm buyer–seller relationships can be leveraged to gain competitive advantage. Indeed, such high-quality inter-firm relationships (IFRs) can be considered strategic assets in a very real sense (Achrol, 1991; Day, 1994; Johnson, 1999; Larson, 1992). Scholars have suggested that the ability (or capability) to build and maintain high-quality and productive IFRs develops when firms engage in building knowledge bases that pertain to IFR partnering (Day, 1994). Through organizational learning, the firm can develop a competence for effective and successful partnering in IFRs. However, scholars have long acknowledged that learning in firms does not happen serendipitously or randomly (Johnson & Sohi, 2003). The surrounding conditions contribute to and support learning in the firm. In strategic alliances, for example, Hamel (1991) suggested that conditions within the partner firms and the relationship itself provide the platform for learning with regard to technology transfer or acquisition of other knowledge.

2. Statement of the Problem

Within the last two decades, there has been increasing awareness among firms across global cultures about the importance of knowledge in achieving and sustaining organizational competitive performance. This research study is aimed at conceptualizing the knowledge strategy concept by linking organizational knowledge assets with strategic orientation constructs. Within the existent body of literature on organizational knowledge assets, there is still a gap with identifying how organizational knowledge capabilities, resources and processes should be linked to the organizational strategic orientation as a means of achieving competitive advantage (Davenport, 1999). None the less, addressing this gap is important to ensure that the information and knowledge resources in the organization are; vital for the strategic pursuit of the firm; and properly processed by the firms interconnected knowledge assets to achieve the desired competitive advantages.

Most of the existing empirical literature on knowledge assets is in favor of developed countries. Kamaşak, Bulutlar, and Yücelen (2015) conducted an empirical study in Turkey that sought to identify any link that knowledge assets represent the fount of an organization's competences and capabilities that are deemed essential for its growth, competitive advantage and human development. Cho (2020) in Korea investigated whether firms' experiential knowledge assets and path dependence in their innovations affect firm value. The results showed that a firm's experiential knowledge assets have a positive effect on firm value. On the other hand, in developing country, Kiseli (2016) conducted a study with the main aim of establishing the effect of knowledge management capabilities on the competitive advantage of five star hotels in Kenya. The study established that organization uses knowledge management to widen the array of products without increasing costs.

Despite the theoretical link between knowledge asset and competitive advantage, empirical studies testing the relationship are scanty. The few empirical studies that have been conducted to examine the linkage between knowledge asset and competitive advantage have been conducted in developed countries. Whereas organizations in Kenya are managing organizational knowledge as a resource for enhancing competitive advantage and performance (Mwihia, 2008; Cheruiyot, Jagongo, & Owino, 2012) past studies have not examined the effect of knowledge asset on the competitive advantage of the firms. To contribute to the understanding of the linkage between knowledge asset and firm competitive advantage in a developing country, this study sought to determine the effect of knowledge asset on firm competitive advantage.

3. Conceptual Literature

3.1. The Concept of Knowledge Asset

The concept of knowledge assets is not something new; it has been long used by the sixteenth-century alchemists that were undertaking precise measures to protect the secrets of their craft. What is new in the late twentieth century is that knowledge assets are coming to constitute the very basis of post-industrial economies (Boisot, 1998). According to the management literature, the concept of knowledge assets is used in reference to the intangible organizational resources (Teece, 2017; Boisot, 2018).

Knowledge assets include a firm's intellectual assets, and employees' skills and knowhow (Hall, 2018), and they are difficult to imitate because of their characteristics (Teece, 2017). A firm's knowledge assets interact with each other (Barney, 2016), generate, renew and arise from experience (Nonaka, Toyoma, & Konno, 2017), and support the firm's processes and activities over time (Helfat & Peteraf, 2016). In fact, knowledge assets are leveraged into a firm's capabilities which in turn shape its products and services, and consequently impact performance (Grant, 2009; Rouse & Daellenbach, 2019).

Nonaka and Takeuchi (1995) proposed creation of an environment where knowledge assets can flow freely from the people who own them to the people who are in need. In order to create the environment the leaders have to supply the necessary conditions: autonomy, creative chaos, redundancy, requisite variety, trust. Nonaka, Toyama, and Nagata (2017) regard the knowledge assets as the basis of knowledge-creating process and define them as "firm-specific resources that are indispensable to create values for the firm". There are various other definitions of knowledge assets and among them Boisot (2018) defined the knowledge assets as, "stocks of knowledge from which services are expected to flow for a period of time that may be hard to specify in advance, with an economic life viable within industry and market context".

3.1.1. Perspectives of Knowledge Asset

Knowledge assets are viewed in different perspectives for better identification for what they stand for and comprise. Knowledge asset is conceptualized in two perspectives (Ionel, 2012) the Eastern and Western perspectives. In the Western knowledge assets literature, the main means to conceptualize knowledge is through the treatment of the phenomenon as something outside the human being that can be manipulated ad managed. On the other hand, in the Eastern knowledge assets literature, the overriding metaphor is knowledge as feelings and thoughts, where knowledge is viewed as truth, as wisdom (Nonaka & Takeuchi, 1995), with a subjective nature. Owing to the huge number of publications in the West, the perspective of knowledge asset as something that can be controlled, knowledge as capital, has achieved abundant supporters. Capital is regarded as valuable, of great meaning, it is a future asset that can be invested in, it is additive, it permits for returns and most imperative can and must be measured as well as managed. The positive undertones of the word capital are hence translated to knowledge, demonstrating that knowledge is something essential, of great value and an asset of the owner.

Knowledge assets are also viewed from a cognitive perspective. The cognitive perspective states that a cognitive system, no matter if it's human or artificial, creates representations (models) of the reality, and the process of learning appears when this representations are somehow manipulated (used in different inferences) (Choo, 1998). A cognitive epistemology sees organizational knowledge as a system with self-organization characteristics, where people are transparent to the information coming from the exterior (we obtain information through senses and we are using it order to create mental models) (Krogh & Nonaka, 2000). In this perspective, the brain can be perceived as a machine based on logic and detections, which doesn't permit opposite declarations. So, the organization gathers information from its environment, which it process logical. By searches and different cognitive competencies, possible way of actions will be generated - everything is based on the mobilization of individual cognitive resources (Bennet, 2004).

It is known that the brain is not processing sequential symbols, but rather it perceives the whole perspective, global properties, models and synergies. Learning rules are those which can govern how the different components are inter-related. The information it is not just taken from the exterior environment, it can be generated also internally. The familiarity and practice are leading to learning (Dixit & Nalebuff, 1991). The employees form nodes of an organizations system, with relative weak links, knowledge represents an emergent phenomenon which comes from the social interaction of these persons. Knowledge is not present only in the mind of the people, but also in the connections (links) between them. As a representation of this network, the collective mind will be formed, which represents the core of organizational knowledge management (Nonaka & Takeuchi, 1995).

Myers (2017) gives a broader perspective of organizational knowledge assets. He views it as information embedded in routine and process that enable relevant action. It is an innately human quality that inhabits in the living mind since a person should recognize, interpret and internalize knowledge assets. This means a person should act more intelligently because of the prevalence of knowledge assets. Knowledge is a fluid mix of framed experience, values, contextual information (Davenport & Prusak, 2018), and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of "the knower". This means not every person in an organization is able to apply himself correctly to organizational processes because of lack of knowledge. In organizations, knowledge asset often becomes embedded in documents or repositories as well as in organizational routines, processes, practices and norms.

Knowledge as assets just like a firm's current and fixed assets. Knowledge assets are stocks of knowledge from which services are expected to flow for a period of time that may be hard to specify in advance just like services flow from current and fixed assets in Accounting (Boisot, 2018). In most cases, however, knowledge assets last forever, for instance, how to treat malaria unless malaria itself changes. Knowledge assets build on information that is extracted from data. Data is discrimination between physical states that may or may not convey information to an agent. Whether it does so or not depends on an agent's prior stock of knowledge (Davenport & Prusak, 2018). Thus, whereas data can be characterized as a property of things, knowledge is a property of agents predisposing them to act in particular circumstances (Boisot, 2018). In contrast to information, knowledge assets cannot be directly observed. Its existence can only be inferred from the action of agents.

The shift towards a knowledge-based society made knowledge as the center stage of obtaining the sustainable competitive advantage within every aspect of the human life. Nowadays, knowledge is perceives as being of great value, of great importance, as an asset for the future, asset that can be invested in, it is additive, it allows for returns and most important can and must be managed and measured, thus, reinventing the concept of knowledge assets. Despite the multiple perspectives on knowledge assets, the management scholars all agree on the fact that knowledge assets are the basis for value creation within any organization or project (Myers, 2017).

3.1.2. Dimensions of Knowledge Asset

In the strategic management literature, a variety of assets (skills, competency, and capabilities) are specified as knowledge assets. Among them are a firm's controlled skills, competences, and capabilities and the way that they are used to create output (Reed & Defillippi, 2017); facts, assumptions, and heuristics of economic value (Wilkins, 2016); patents, copyrights, databases, employees' brains, processes, and information in information systems (Housel & Bell, 2019); adaptations and interpretations of information, expertise, experiences, errors and other inferences (Debowski, 2016). As many other assets could also be listed, it is clear that they have to be categorized. (Nonaka, Toyama, Nagata, 2017) developed taxonomy of knowledge assets which comprised four types: experiential, conceptual, systemic, and routine knowledge assets.

Experiential knowledge assets are the ones that are gained through mutual hands-on experience of the members of the organization, and between the members of the organization and its stakeholders (Barney, 2016). Skills, know-how, care, love, trust, facial expressions and gestures are among the examples of experiential knowledge assets. As can be inferred from the above given examples, these assets are tacit, and it is difficult to be aware of them. However they are very valuable because they are firm specific and inimitable (Nonaka, et al., 2017).

In the experiential knowledge assets, the authors (Nonaka, Toyama, Konno, 2000) introduced the skills, know-how acquired by individuals in experiences at work. Also emotional knowledge, care, trusts, loves are categorized as experiential knowledge assets. In this category are included the shared tacit knowledge of members of the organization and because the experiential knowledge assets are tacit they are difficult to evaluate, manage and trade.

Routine knowledge assets are another type of tacit assets that have become routine and reflected in the actions and practices of the organization (Polanyi, 2019). Know-how, culture and the way of performing the everyday business are considered as routine assets. They can be gained through stories and myths about the company and they are very practical (Becerra-Fernandez, 2017). Routine knowledge assets include organizational routines as well as organizational culture in carrying out the daily business.

Conceptual knowledge assets, on the other hand, have tangible forms, and include explicit knowledge articulated via images, symbols, language. Conceptual knowledge assets are more explicit in nature and they are transmitted through images, symbols and language. They are based on the perceptions customers and members (Holsapple & Joshi, 1999). Examples include brand equity, concepts, and designs. Although they have tangible forms and it is easier to grasp than experiential knowledge assets, it is hard to understand what members and other's perceptions are (Uriarte, 2018).

The systemic knowledge assets consist of systematized explicit knowledge, where manuals, product specifications, stated technologies are just some of the examples. Systemic knowledge assets are another type of explicit knowledge which is systemized and arranged (Ray, Barney, & Muhanna, 2019). They include clearly stated technologies, product specifications, manuals, and documentations. Contrary to experiential knowledge assets, systemic knowledge assets are the most tangible ones and thus they can be transferred relatively easily (Dierickx & Cool, 2014).

3.1.3. Adoption of Knowledge Assetin Strategic Management and Outcomes

The value of knowledge for the modern enterprise is increasingly being recognized the world over (Benson & Brown, 2017), and more and more enterprises are explicitly attempting to manage this important asset. To be successful in the management of knowledge as an asset, it is of fundamental importance to recognize that knowledge assets, just as any other asset of the enterprise, should be managed in the context of the overall business (Massingham & Diment, 2009). The focus is therefore, not on knowledge per se, but rather on managing the business to include a knowledge perspective. This is achieved by recognizing that knowledge is a valuable asset that should be managed explicitly in an enterprise (Alam, 2019).

Traditionally many enterprises have taken an ad hoc approach to managing knowledge, resulting in work duplication, inconsistent work practices and loss of important organizational knowledge when employees retire or leave the company (du Plessis & du Toit, 2017). The linking between knowledge management and the business strategy is viewed as the crux for successful knowledge management in any enterprise. Thus Nonaka and Takeuchi (2014) state “the most crucial element of corporate strategy is to conceptualize a vision about what kind of knowledge should be developed and to operationalize it into a management system for implementation”. Strategy can be viewed as an instrument that the enterprise must excel at to ensure its survival in a competitive environment (Kruger, 2018). According to Yang (2017) knowledge sharing and knowledge integration are key factors in achieving a competitive advantage. Yang argued that “companies can change from a situation where lost knowledge causes intellectual liabilities to a situation where shared knowledge results into intellectual assets”. The question may be posed as to the importance of knowledge management and its contribution to the competitive position of enterprises and further to those of industries and beyond to that of nations (Alam, et al, 2016).

Knowledge plays a crucial role in the competitive nature of enterprises and hence constitutes a critical component of enterprise strategy (Minguela-Rata et al., 2018). However, Bateman and Snell (2017) define knowledge management as practices to discover and harness the intellectual resources of an enterprise embodied by the individuals employed by the enterprise (Alam et al., 2016). The aim of such a knowledge management definition is to find, unlock, share and capitalize on the expertise and skills of employees (Arsenijević et al., 2019). Snowden (2010) defines knowledge management as “the identification, optimization and active management of intellectual assets, either in the form of explicit knowledge held in artifacts or as tacit knowledge possessed by individuals or communities”. All enterprises have a mechanistic, organic as well as dynamic nature that influences how the knowledge is exchanged among the participants in the enterprise (Ståhle, 2010). The important thing is the recognition, that the enterprise environment plays a major role in knowledge exchange and should be accepted as a characteristic in the process of attempting to define knowledge management. Snowden (2015) states that to actively manage intellectual assets, management needs to bring together, in a sustainable and appropriate environment, the explicit knowledge artifacts as well as the tacit knowledge communities.

Arguably one of the main challenges with knowledge assets is their dynamic nature. They are both inputs and outputs of the organization’s knowledge creating activities, and as a direct result of that they are constantly changing (Nonaka, Toyama, Konno, 2000). In order to govern knowledge-based value creation mechanisms, an organization must measure and manage knowledge assets dynamics (Schiuma, 2009a).In the views of Kinyua (2015), management can make use human capital repository to optimize the benefits knowledge assets in their endeavor to create and sustain competitive advantage. In essence, aspects of knowledge assets as acquisition of knowledge, transfer of knowledge, knowledge application, community of practice, knowledge conversion have been noted to be instrument for enhancing the competitive position and performance outcomes of enterprises in the market place(Kinyua, Muathe& Kilika, 2015; Gatuyu & Kinyua, 2020; Kisilu & Kinyua, 2020).

3.2. The Concept of Competitive Advantage

Korsakienė (2016) argues that the competitive advantages include positional and performance advantage relative to competitors due to the business held and distributed resources and capabilities advantage. Therefore, the competitive advantage is defined as a significant advantage over its competitors due to the cost allocation and the results of the operation of which depends on the positioning strategy. Competitive advantage is preventing the acquisition of goods or service provider to relax, because competitive advantage can be copied. Competitive wars are going on constantly, so there's no guarantee that competitive advantage will be maintained for long (Sekliuckienė & Langvinienė, 2018).

Competitive advantage is the increased rate of attractiveness a firm offers compared to competitors from customers’ viewpoints (Lewis, 2017). In the literature on competition strategy, competitive advantage is regarded within the framework of value creation as anything that increases income over costs (Piatkowski, 2018). Saaty and Vargas (2019) believes competitive advantage lies in the properties or dimensions of each firm enabling it to offer better services than the competitors like better value to customers (Sachitra & Chong, 2019). Competitive advantage is defined as the presentable values of a firm for customers so that these values outweigh the price paid by the customer (Ritala & Ellonen, 2018).

According to the above definitions of competitive advantage, it seems that a direct relation between customers' expected values, values offered by the company, and those offered by the competitors determine the dimensions and conditions of competitive advantage (Boisot, 2018). If the values presented by the company are closer to customers' expected values compared to the values offered by competitors, it can be said that the firm has competitive advantage over its competitors in one or more indices. This advantage makes the company superior to its competitors in proximity to customers and capturing his heart (Piatkowski, 2018).

3.2.1. Measuring Competitive Advantage

In concert with the concept of competitive advantage, there is a rich literature foundation for measurements of competitive advantage in relation to different sectors or industries (Kiel, Smith, & Ubbels, 2018). Competitive advantage could be analyzed by using past performance indicators or potential competitiveness indicators (Frohberg & Hartmann, 2008). For example, market share, productivity (Farole, Guilherme, & Wagle, 2015); product cost, gross margin, returns on assets, net income, unit cost ratio (Toit, Ortmann, & Ramroop, 2017); total factor productivity (Yee, Ahearn, & Huffman, 2016); financial performance (profit, sales growth, returns of investment), non-financial performance (customer satisfaction, employees growth (Rahman & Ramli, 2017); and benchmarking, balanced scorecard (Kozena & Chladek, 2017).

While measuring firm level competitive advantage; profitability, costs, productivity, and market share are often used indicators (Depperu & Cerrato, 2015) because competitive advantage is identical with performance. Competitive advantage enables a firm to earn profits that are higher than the average profit earned by its competitors (Dziwornu & Raymond, 2019). Thus, profitability is a key variable for measuring competitive advantage and turnover is a kind of profit margin that firms often have to rely (Fischer & Schornberg, 2016). The growth of market share is one logical realized consequence of the improvement of competitive advantage. Therefore, market share of a particular product is considered as an indicator to measure the competitive advantage of an industry or a firm. The studies of (Frohberg & Hartmann, 2008; Farole, Guilherme, & Wagle, 2015; Rahman & Ramli, 2017; Voulgaris, Papadogonas, & Lemonakis, 2019) concluded that in order to measure the firm's competitive position, market share is an important indicator.

Productivity, market share, and profitability are traditional economic indicators which are seen as inadequate to measure competitive advantage at the firm level. This scenario is also similar to the agribusiness sector; measurement of competitive advantage of this sector relatively concerns with market share, productivity, profitability, and revealed comparative advantage (RCA) indices. The RCA index is widely used to measure competitive advantage in agricultural sector (Kumar & Rai, 2014; Gaytán & Benita, 2018; Thamiem, Weerahewa, Pushpakumara, & Singh, 2018). The study of Notta and Vlachvei (2016), use market share, profitability, and productivity as measurement indicators of competitive advantage for the food and beverage manufacturing industry. Kozena and Chladek (2017) measure competitive advantage of agricultural sector utilizing productivity as ratio indicator. Woodford, Greer, and Phillips (2014) use productivity to assess competitive advantage of dairy farming sector. In addition, Toit, Ortmann, and Ramroop (2017) employ profitability to measure competitive advantage of commercial milk producers in South Africa, while Yee, Ahearn and Huffman (2016) utilize total factor productivity of agricultural firms in South-eastern States.

However, the terms competitive advantage and performance are conceptually differed (Powell, 2013; Newbert, 2018). Competitive advantage refers to the economic value that has been created from the exploitation of a firm's resource-capability combination, whereas, performance refers to the economic value that the firm has created from their commercialization (Newbert, 2018). The competitive advantage proposition may show a better way to achieve superior performance of an organization (Powell, 2013) to achieve the desired target earnings of the sector. In this rapid pace of competition, farms are required to be more competitive and hostile. Whenever competitive advantage is present, superior performance is achieved and whenever superior performance is achieved, competitive advantage is presented (Powell, 2013). Hence, performance measurement indicates are inappropriate to measure competitive advantage at firm level.

Further, there are certain limitations of productivity and profitability as the measurements of competitive advantage such as lack of availability and reliability of data, failure to measure quality level and innovation, and difficult to compare between industries (Voulgaris, Papadogonas, & Lemonakis, 2019). Acknowledging that, Kadocsa (2012) also emphasizes that the measurement points of competitive advantage such as revenue, profit, and productivity can be quantified and accessible but sometimes those are difficult to quantify or access. Further, Singh, Kiran, and Goyal (2015) mention that partial productivity indices are not succeed due to fail to measure the technical progress. Moreover, productivity can be defined in different terms, namely land productivity, labour productivity and capital productivity. Hence, there is no universally accepted criterion to measure productivity. Notta and Vlachvei (2016) use labour productivity, whilst Kozena and Chladek (2017) employ land, material and labour productivity. Any measurement indicator of a firm's competitive advantage should take into account a long-term rather than short-term orientation. The concept of profitability may be ambiguous because it requires the definition of a period of time over which the measurements are carried out.

Similar to the limitations of productivity and profitability dimensions, lack of availability and reliability of financial data on total market sales keeps market share away from the dimension of competitive advantage measurement. While competitive advantage is often observed through changes in market share, a firm may hide its competitive weakness by manipulating price (Farole, Guilherme, & Wagle, 2015). As such, although market share is one indicator that a firm can use to measure its competitive advantage Kozena and Chladek (2017), it may be problematic when analyzing aggregates. In the context of RCA, Latruffe (2014) claims that the RCA measures competitive advantage at aggregate level rather than at firm level. In order to measure competitive advantage at the firm level, assessment should include determinants from the firm level factors.

Therefore, in order to identify the factors affecting competitive advantage, there should be clear dimensions to measure competitive advantage of a firm. Sun, Fan, Zhou and ve Shi (2017) made a unique change to Porter's diamond model, arguing that three parameters of diamond model (factor conditions, demand conditions, and related and supporting industries) are covered in the fourth dimension of the diamond model, this is firm's strategy, structure and rivalry. Content validity of the model developed by Sun, *et al.,* (2017) was confirmed by Bakan and Dogan (2018) who employed the same model to determine the factors affecting competitive advantage of selected sectors.

4. LITERATURE REVIEW

An extensive review of the vast body of relevant theoretical and empirical literature was carried out as guided by the key construct in this conceptual review. This section therefore, presents the theories that underpin the construct of Knowledge Asset and Competitive Advantage as well as related empirical literature.

4.1. Theoretical Review

The following two theories were reviewed:

4.1.1. Resource Based View Theory

The Resource Based View is a theory which was first initiated by Penrose in 1959. Barney, who is also considered as an important contributor to the RBV, says the RBV "examines the link between a firm's internal characteristics and performance" (J. Barney, 1991, p. 101). The core idea of the theory is that instead of looking at the competitive business environment to get a niche in the market or an edge over competition and threats, the organization should instead look within at the resources and potential it already has available.

The Resource-based View (RBV) of the Firm is an approach to business strategic management that emerged in 1980s and 1990s. Major proponents were Wernerfelt, B. ("The Resource-Based View of the Firm"), Prahalad and Hamel ("The Core Competence of The Corporation") and Barney, J. ("Firm Resources and Sustained Competitive Advantage"). But its origins can be traced as far back as Edith Penrose and "The Theory of the Growth of the Firm" (1959). The origins of the RBV go back to Penrose (1959), who suggested that the resources possessed, deployed and used by the organisation are really more important than industry structure. The term 'resource-based view' was coined much later by Wernerfelt (1984), who viewed the firm as a bundle of assets or resources which are tied semi-permanently to the firm (Wernerfelt, 1984). Prahalad and Hamel (1990) established the notion of core competencies, which focus attention on a critical category of resource – a firm's capabilities. Barney (1991) also argued that the resources of a firm are its primary source of competitive advantage.

The resource-based view (RBV) of the firm draws attention to the firm's internal environment as a driver for competitive advantage and emphasizes the resources that firms have developed to compete in the environment (Hoskisson et al. 1999). There are primarily two assumptions of the resource-based view that all the resources of the organization should be heterogeneous and immobile. This is the first primary assumption of resource-based view theory. Heterogeneous refers to the variation in capabilities and skills from one organization to the other (Furrer, Thomas & Goussevskaia, 2018).

Researchers subscribing to the RBV argue that only strategically important and useful resources and competencies should be viewed as sources of competitive advantage (Barney, 1991). They have used terms like core competencies (Barney 1991; Prahalad & Hamel, 1994), distinctive competencies (Papp & Luftman, 1995) and strategic assets (Amit & Shoemaker 1993) to indicate the strategically important resources and competencies, which provide a firm with a potential competitive edge. A number of criticisms of RBV have been widely cited, and are as follows: The RBV is tautological. Different resource configurations can generate the same value for firms and thus would not be competitive advantage. The role of product markets is underdeveloped in the argument (Markides & Williamson 1994).

Resource-based theory suggests that resources that are valuable, rare, difficult to imitate, and non-substitutable best position a firm for long-term success. These strategic resources can provide the foundation to develop firm capabilities that can lead to superior performance over time (Furrer *et al.* 2018). The resource based theory or resource based view helps in determining the resources available within the firm and relates them with the capabilities of the firm in a silent manner. Along with this, brands and patents can also be considered important resources of an organization (Barney, 1991). This theory supports the competitive advantages variables.

4.1.2. The Knowledge-Based View

While Drucker (1993) may be credited for coining the concepts "knowledge worker" and "knowledge work", it was Nonaka (1991) who introduced the idea of a "Knowledge-creating company". In his argument, a "knowledge-creating company" is defined by its ability to create new knowledge, disseminate the knowledge quickly throughout the organisation and embodying the knowledge into technologies and products.

While most researchers subscribing to the RBV regard knowledge as a generic resource, some researchers (Teece, Pisano & Shuen, 1997; Murray, 2014; Tiwana, 2016) suggest that knowledge has special characteristics that make it the most important and valuable resource. Hamel and Prahalad (1994) argue that knowledge, know-how, intellectual assets and competencies are the main drivers of superior performance in the information age. Evans (2015) and Tiwana (2016) also suggest that knowledge is the most important resource of a firm. Evans (2015) pointed out that material resources decrease when used in the firm, while knowledge assets increase with use. Tiwana (2016) argued that technology, capital, market share or product sources are easier to copy by other firms while knowledge is the only resource that is difficult to imitate.

One of the critical weaknesses of existing knowledge-based theories is the definitional ambiguity when it comes to the main construct, knowledge. First, there is disagreement about the level of analysis at which knowledge is a valid concept. Grant (1996), for example, postulates that knowledge exclusively resides in individuals. However, March and Simon (1958) as well as Levitt and March (1988) contend that organizations accumulate knowledge beyond that which is embodied in individuals through organizational learning.

The relevance of the theory is that the knowledge is embedded and carried through multiple entities including organizational culture and identity, policies, routines, documents, systems, and employees. Originating from the strategic management literature, this perspective builds upon and extends the resource-based view of the firm (RBV) initially promoted by Penrose (1959) and later expanded by others (Wernerfelt, 1984; Barney, 1991). The knowledge-based view supports the knowledge assets variables.

4.2. Empirical Literature Review

Kamaşak, Bulutlar, and Yücelen (2015) conducted a study with the aim of defining, within the context of Turkish firms in the both the manufacturing and services industries, what constitutes a knowledge asset, and to identify any link between strategic management and knowledge management.

To achieve this, a survey was conducted by the questionnaire of Paul James (2005). The questionnaire consisted of a total number of 37 items. The first 31 items were used to reveal what the knowledge assets are and which knowledge assets were perceived as the most important by the firms. And the last 6 questions were used to explore the knowledge asset influence on the development of an organization's strategy. From the study findings, it was revealed that knowledge assets represent the fount of an organization's competences and capabilities that are deemed essential for its growth, competitive advantage and human development.

A study by Cho (2020) investigated whether firms' experiential knowledge assets and path dependence in their innovations affect firm value. For the analysis, the author used 37 firms in the semiconductor industry in Korea. These firms were listed on the Korea Stock Exchange and the Korea Securities Dealers Association Automated Quotation as of 2010 and through 2015. The dependent variable was measured by return on assets as firm value, and the ordinary least squares estimation was used. The results showed that a firm's experiential knowledge assets have a positive effect on firm value. In addition, when a firm creates new knowledge, if the firm follows path dependence by using its own knowledge, it has a positive effect on firm value. By contrast, when a firm conducts innovations using knowledge created by other firms, it has no effect on the value of the firm. Additionally, it was found that technological innovation based on experiential knowledge assets and path dependence has a positive effect on firm value in the short term but has no effect in the medium term. Thus, firms need to continue their innovation to maintain their competitive advantage and to use their existing experiential knowledge in innovation in order to have high performance.

Yu, Zhang, Lin and Wu (2017) in their study examined the relationship between the experiential knowledge creation process and technological innovation capabilities, and analyzed their effect on a firm's sustainable competitive advantage using a knowledge-based view theoretical framework. The authors conducted structural equation modeling analyses using survey data from 315 Chinese industrial firms to test the direct and indirect effects of the experiential knowledge creation process on sustainable competitive advantage. Technological innovation capabilities, operationalized to reflect the dimensions of process innovation capability and product innovation capability, are used as the mediating variable for explaining the relationship between the experiential knowledge creation process and sustainable competitive advantage. The results indicate that the experiential knowledge creation process does not have a significant direct effect on sustainable competitive advantage. Rather, the experiential knowledge creation process can only influence the sustainable competitive advantage through the mediating effect of technological innovation capabilities completely. Consequently, the experiential knowledge creation process favors the development of technological innovation capabilities for processes and products, because processes and products can lead to a sustainable competitive advantage.

Mahdi, Almsafir and Yao (2018) carried out a study to find out the roles of experiential knowledge and knowledge management in achieving sustainable competitive advantage (SCA) within organizations. Assuming experiential knowledge and KM practice as strategic and tactical element respectively, a systematic literature review was carried out from definitions, derivations to interrelations, covering both traditional and contemporary theoretical studies. Through comparison and summarization, it is found that knowledge and knowledge management potentially affects the process of SCA from different aspects. The study suggests that firms re-bundle strategic knowledge from various types and transform it by using knowledge management in order to sustain competitive advantage under today's new business environment characterized by dynamic, discontinuous and radical pace of change.

Omerzel and Gulev (2016) discussed in their study some definitions of knowledge as a potential source of competitive advantage. The study reviewed the literature pertaining to the assessment of experiential knowledge assets. According to the resource-based view, which links the competitive advantage of organizations with resources and capabilities that are firm-specific, and difficult to imitate or substitute, a firm's competitive advantage is built on a set of strategically relevant resources. The study found that when organizations have access to similar resources, it is those organizations that are able to maximize the utilization of those resources that attain a competitive advantage.

Chou and He (2016) did a comprehensive and feasible model that delineates the interrelationships between knowledge assets and knowledge creation processes. The study investigated the interrelations among four categories of knowledge assets and four knowledge creation processes; socialization, externalization, combination, and internalization. In their framework, they argue that different types of knowledge assets may have differing influences on knowledge creation. In order to test the feasibility of this framework, the authors conducted an empirical research exercise. This study employed a survey instrument to collect data from a wide variety of organizations in manufacturing, trade, transportation and service industries, computer industries, finance, and academic institutions. A total of 204 usable responses were analyzed. Compared to other knowledge assets, routine knowledge assets have a greater effect on socialization of knowledge creation process.

Kiseli (2016) conducted a study with the main aim of establishing the effect of knowledge management capabilities on the competitive advantage of five star hotels in Kenya. The study specifically focused on how technology KM infrastructure capability, social KM infrastructure capability, KM process capability and KM innovation agility affect the competitive advantage of five star hotels in Kenya. A descriptive research design was applied in this study. A total of 313 management staff in the five star hotels in Nairobi formed the possible respondents of this study. A sample of 172 respondents was taken using stratified random sampling across the top, middle level and low level management staff. The researcher analyzed the quantitative data using descriptive statistics by applying the statistical Package for Social Science (SPSS V.21.0) and presented through percentages, means, standard deviations and frequencies. With regard to the Hotel's organizational structure, the study established that organizations design processes to facilitate knowledge exchange across functional boundaries. Regarding measures of People (T-shaped Skills), the study established that organization's members are specialists in their own field of expertise and that organization's members can make suggestions about others tasks. Concerning competitive advantage, the study established that organization uses knowledge management to widen the array of products without increasing costs.

Bou-Llusar and Segarra-Cipre´s (2017) analyzed the implications for competitive advantage deriving from strategic knowledge and knowledge transfer process. One major issue in a knowledge-based (KBV) view consists of delimiting the source of competitive advantage, that is, knowledge versus knowledge management processes (acquisition, transfer, generation). Based on the KBV and knowledge management literature, the study considered the importance of both elements. Specifically, the study focused on strategic knowledge and knowledge transfer process. The contributions of the study are the proposal of strategic knowledge characteristics and the suggestion of a theoretical framework to study the internal transfer of strategic knowledge. The main conclusion is that the characteristics of knowledge that generate competitive advantage also create barriers for internal transfer. The research question addressed here is what firms must do to transfer strategic knowledge within the firm while limiting involuntary transfer.

Kamau and Kwanya (2016) investigated and presented the impact of knowledge management strategies on insurance firms in Kenya. The study had objectives of examining the current knowledge management strategies used in insurance firms; analyzing how the knowledge management strategies used have contributed to the competitiveness of the firms; determining the challenges insurance firms face while using knowledge management as a strategic tool for achieving competitive advantage; and to suggesting possible solutions to the identified challenges. The study was a case study of UAP Insurance Company. Data were collected using interviews from 105 respondents selected through information-oriented purposive sampling. The data were analyzed through descriptive statistics. The findings indicated that knowledge management strategies are being used as tools for gaining competitive advantage in the insurance industry in Kenya. The authors also revealed weaknesses in the management of knowledge in the insurance sector, and suggested that the industry should embrace structured knowledge management techniques.

Abbas, Syarif, Rianse and Nurwati (2016) conducted a study to analyze the effect of systematic knowledge management on competitive advantage. The population in this study was all the College managed by the community in Southeast Sulawesi that numbered 37 universities. The questionnaire used in this study was distributed to higher education managed by the community through two ways: (1) researchers delivered directly to the college managed by the community through the institution or personally to the leadership of the University managed by the community in Southeast Sulawesi. Then make an agreement for the return of the questionnaire. (2) Researchers delivered the questionnaire through APTISI Kendari that then distributed to higher education managed by the communities that are the target population in this research. Through two ways, the entire questionnaire distributed. Samples used in this study as much as 90 samples. Methods of data analysis used in this research are Structural Equation Modeling (SEM) based on partial variance Least Square (PLS). The result showed that knowledge management has positive and not significant influence on the competitive advantage.

4.3. Proposed Theoretical Model

Theoretical model is imperative in helping to reveal the relationship between independent variables, moderating variables, mediating variables and dependent variable. In the case of this independent study, a theoretical model was proposed that illustrated the relationship between Knowledge Asset and Competitive Advantage. This relationship is demonstrated in Figure 5.1.

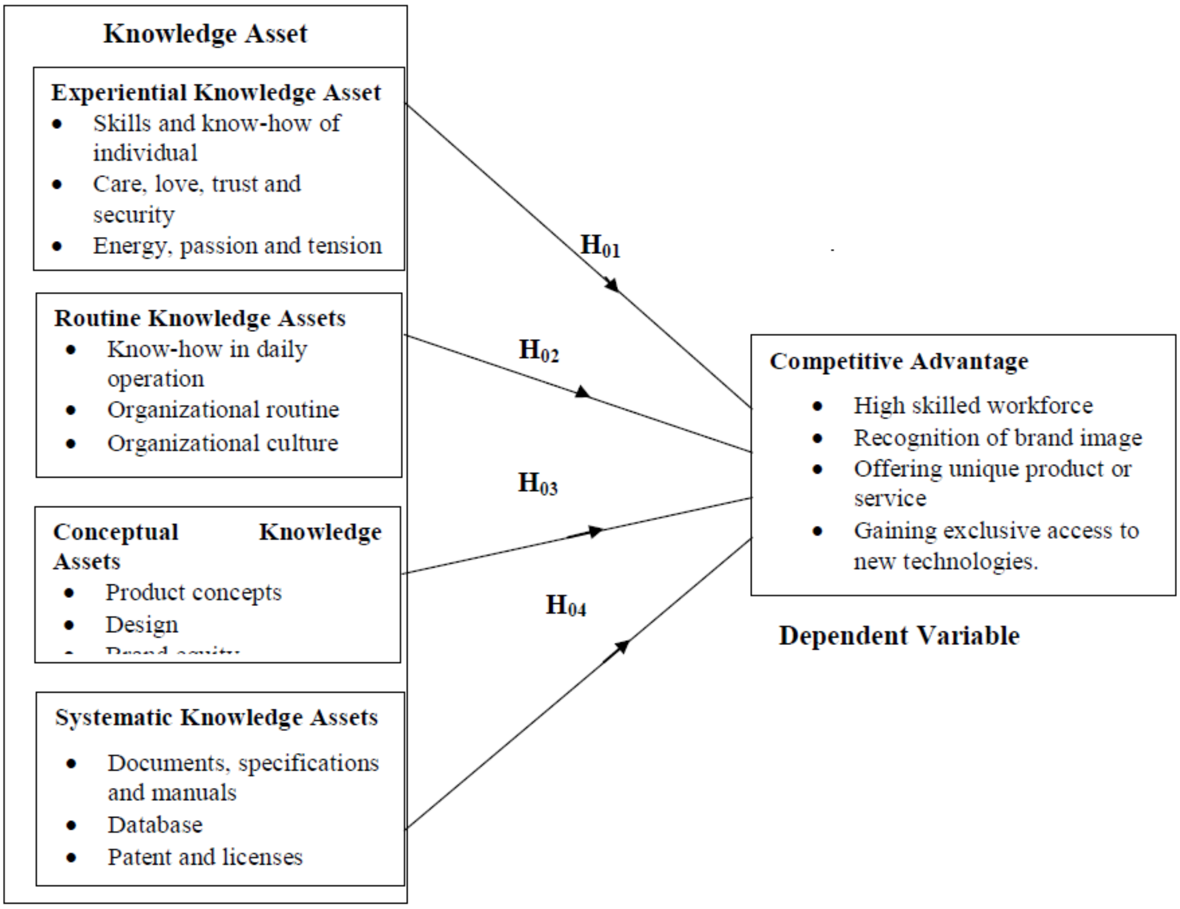

Figure1. *Proposed Theoretical Model*

Source: *Author (2021)*

The proposed model shows Knowledge Asset is the independent variable and competitive advantage is the dependent variable. In the study, the parameters that measure knowledge assets are experiential knowledge assets, routine knowledge assets, conceptual knowledge assets, and systematic knowledge assets.Experiential knowledge asset helps an organization build tacit knowledge through working experience and hands-on experience amongst employees. This knowledge asset assist in creating skills and know-how of individuals, ensure care, trust, love as well as security of each other and builds energy, tension and passion among the employees.

Routine knowledge asset is very important parameter as it shows the know-how in daily operations of an organization, reveals the organizational routine as well as the organizational culture. The organization has created the routine on its daily operations hence makes it easy for the organization to master the unique ways of doing things. Conceptual knowledge on the other hand is an explicit knowledge represented by assets founded on perceptions held by employees as well as customers of the organization. The knowledge assets are demonstrated by product concepts, brand equity, and design. Systematic knowledge assets are again important to an organization that is eager to achieve and sustain competitive advantage. These assets are documents, specifications, manuals, database, patent and licenses, and packaged information about the suppliers and customers.The theoretical model illustrates that competitive advantage, as a dependent variable is determined by high skilled workforce, recognition of brand image, gaining exclusive access to new technology, and offering unique products or services.

5. Conclusion

The study has explored the relationship between knowledge assets and competitive advantage. The study in chapter five proposed a theoretical model that showed the relationship and interlink between knowledge assets and competitive advantage. By utilizing theoretical literature as well as empirical literature, the study examined knowledge assets plus the parameters measuring knowledge assets and show how they affect competitive advantage of an organization. The guiding principles and theories in this study were based on two theories namely; the resource based view and knowledge-based view.

The study has proposed a suitable theoretical model that shows the relationship between knowledge asset and competitive advantage. Knowledge asset is the independent variable and competitive advantage is the dependent variable. The study showed that all parameters of knowledge assets (experiential knowledge assets, routine knowledge assets, conceptual knowledge assets and systematic knowledge assets) are critical in determining competitive advantage of an organization. The empirical and theoretical literature about knowledge assets and competitive advantage has been enhanced by the findings of the study hence any further research on knowledge assets and competitive advantage will have additional source of information.

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