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This Study Examines the Antecedents and the Effects of Knowledge Management and Information Technology in the Manufacturing Industry

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Abstract--- *There is an extensive recognition that organizations and the contexts upon which they operate have significantly evolved from the industrial era. The potential-industrial market or environment is currently viewed as significantly different in several ways. In this age and time, organizations increasingly consider knowledge as a pivotal ingredient in the achievement of their competitive advantage. However, given the case-based illustrations and the anecdotal value regarding the consideration of an organizations competitiveness from a knowledge-based purview, there are significant claims from empirical studies that support these sentiments. Knowledge management (KM) currently remains a fundamental issue in an organizations business strategy. KM is therefore considered as a critical aspect of an organization given the fact that its proponents radically complement the business functions and activities of an entity. Given the fact that the new markers are currently focused on a knowledge-based form of economy, knowledge is therefore considered as a cardinal asset in the achievement of a firm's success among other assets that include capital, properties, materials, and machinery. Through a successful approach directed towards capturing knowledge, sharing, and creating opportunities for its use, industrial organizations remain at a better state of improving the process of learning in a bid to enhance their performance while equally creating possibilities to attain their competitive advantages. An organization learning the process, therefore, relies on its ability to engage in the collection and the integration of knowledge, behaviors, and skills which can enhance the process of learning and improving performance. This review paper will indulge several empirical studies conducted on KM in an effort directed towards drawing an understanding of its importance in organizations in this era.*

Keywords--- *Effects of Knowledge Management, Information Technology, Antecedents, Manufacturing Industry.*

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I. INTRODUCTION

The element of knowledge management and innovation are currently considered as integral in all aspects and operations of an organization given the fact that they determine the survival of entities in the corporate market. However, studies have revealed that it is incredibly challenging for companies to retain and continue maintaining their innovation, with this detailing the need for an effective strategy geared towards the achievement of success within organizations. In manufacturing firms, one of the significant inputs of innovativeness lies in the purposeful creativity of the employees who originate from diverse backgrounds and with compelling ideologies while the other aspect of innovation basically involves how manufacturing organizations conduct their innovative practices from a technical and managerial perspective [13]. Given this, it is fundamental to assume that the management of knowledge and information technology within the manufacturing industry remains a challenge that these entities encounter in their efforts to retain their positions in the market and achieve their competitive advantage. Knowledge management, in this case, remains an ingredient that is cardinal in improving the competitiveness and innovativeness of the manufacturing industry. This research inquiry, therefore, seeks to delve into the antecedents and the effects of knowledge management and information technology through an empirical study that will focus on the manufacturing industry.

II. LITERATURE REVIEW

A. Knowledge Management and Information Technology

Through, Altarawneh&Altarawneh, (2017)[2] reveals that the fundamental goal of organizations lies in the accumulation as well as the application of the acquired knowledge in the production of goods and services.Handzic (2015)[8] alleges that knowledge is currently crucial and pervasive within the emerging paradigms, with this attributed to the significant changes between knowledge assets and capital goods needed in the creation of a business's economic value. The awareness raised regarding the value and the importance of the knowledge that is directly embedded in routines and processes as well as the awareness of knowledge as a significant factor of production remains one of the fundamental reasons why there is an increasing interest in the element of knowledge and its management. Knowledge, as suggested in this case, is therefore viewed as a factor of production that has a potential influence as opposed to the traditional triads of capital, land, and labour.

Organizations within the manufacturing industry mainly gain new knowledge from an external environment or through boundary sensors and engage in the generation of new knowledge through varied activities. As different individuals and practices participate in the management of experience as well as the factors that significantly impact these procedures, efficient interventions directed towards the promotion of these practices among employees is incorporated [14]. In this case, gaining an understanding on the extent to which innovation or rather information technology significantly impacts the worker's knowledge management procedures, therefore, plays a crucial role in enabling organizations to engage in the evaluation of the merits established in employing different systems that play an essential role in supporting these procedures. Further, a look at how information technology impacts of supports these procedures help organizations in creating, promoting, and customizing information technologies that suitably meet their specified knowledge needs.

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Valid as well as reliable measures used in knowledge management procedures, therefore, help the organization as well as researchers in sporting out some of the factors that are of significance in varied contexts as well as the specified outcomes of interest. As a result of the increasing gaps between the book value and market of an organization, it is essential to establish that the capital of an organization does not only consist of its financial capacity but on its intellectual capital, thus pointing to the need of intellectual capitalism as an essential attribute in achieving success in innovation. An organization's intellectual capital can be determined as commercialized knowledge that an organization has acquired and developed during its period of operation. In consideration of its rapid growth, it is essential to mention that the aspect of systematic knowledge management is required within an organization to be competitive within a market.

In as much as the concept of knowledge management gives a representation of an organization's management process, organizations need to understand that it is not functional activity, but an activity that needs to be initiated within an organization's highest managerial level. Knowledge management can, therefore, be considered as a tantamount resource for a company in achieving its competitive advantage and staying innovative. Innovation and competitive advantage consequently find its source in knowledge and knowledge management, an efficacious means through which a company develops itself [11]. Presently, knowledge is considered as a significant source of competitive advantage, thus aiding an organization to be effective in innovation. Potentially, knowledge viewed as a substantial resource to an organization mainly includes unusual, precious, non-commutable, unique features. The significance of knowledge has immensely grown in society today, and as a result of this shift, individuals think diversely in regards to business innovation [7]. Innovation that results from a knowledge-based organization is an aspect that occurs in different markets. This is similar to manufacturing industries knowledge and knowledge management practices and the interventions that these organizations within this context incorporate to improve its present knowledge management strategies and practices.

III. THEORY DEVELOPMENT

A. Information Technology and its Support to Knowledge Work

One of the cardinal reasons regarding the increasing interest in matters knowledge within the manufacturing industry lies in the fact that work, as opined in the views of Vukasinov&Draskovic (2013) [16], is currently knowledge-driven or preferably knowledge oriented. In other words, work has turned out to be more involved, making it extremely challenging to partition routine tasks that can then be delegated to specialized employees. Part of this reason is in the fact that computers have turned out to be versatile and flexible in doing what regular employees are assigned, thus making it economically efficient to ensure that routines works in manufacturing industries are delegated to computers. This, as established in this case, therefore, parallels all the efforts put through at the commencement of the last few centuries directed towards delegating physical labour to different machines. The difference thus reveals that more cognitive types of works or tasks are now entrusted to computers or robots, an aspect that therefore implies that humans are left with what is remaining out of the intricate work.

Even with the increasing and the mushrooming levels of industrial automation as well as the reliance on machine power, people still engage in physical work. Consequently, this does not imply that the computers may only perform

all the cognitive forms of work, but as the use of computers improves regarding the handling of the complex as well as cognitive tasks, it is essential to note that human work is equally likely to be pushed towards addressing complex responsibilities. This, therefore, implies that human work will mainly require more knowledge regarding the integration of innovation or rather information technology than before for the near future. This equally means that there will be increasing use of computers extrapolated on the accomplishment of work, given the fact that these changes are currently underway [12].In this case, we assume that the work that mainly requires employees to make use of their cognitive efforts in the accomplishment of their work may be defined primarily as knowledge work. This can equally be used in extensively determining IT and how it supports knowledge work given the fact that work that requires employees to think and make use of their knowledge in performing their tasks requires a significant implementation of computers.

B. Conceptualizing Knowledge

The indistinct concept of knowledge management as portrayed in literature as the model of knowledge in entirety. However, knowledge, as viewed by Keying et al., (2010) [9], lies in a different distinct variant, detailing that it is one of the common words used in lending to a scientific inquiry. Knowledge, on the other hand, has had a profound philosophical debate ever since the Socratic era. However, as efforts are directed towards identifying knowledge as a significant resource that plays a vital role in promising organizations within the manufacturing industry as a sustained competitive advantage, there has been a notable increase of theories that have increased the interest of understanding and defining the knowledge and its proponents as concrete terms. Literature, therefore, posits that the difficulties of understanding and defining knowledge and its proponents mainly stem from the limitations in theories regarding knowledge. Other studies consider knowledge as an efficient and challenging conceptualization of information. These differences are mutually dependent. On the other hand, it is essential to note that it is challenging to contrasting theories with no working definitions. Definitions, in this case, may not be efficient in supporting a set of assumptions.

Given the nature of these difficulties, three main themes have evolved from varied emerging literature in regards to knowledge. One of the issues is primed on tacit-explicit approach and quality of knowledge, raising questions as to whether knowledge may be classified as either implicit or explicit. In other words, knowledge can be discerned and identified as either tacit or explicit. Given this, the conceptualization of knowledge as a process may be confounded in this study, with this attributed to the fact that there is a growing interest regarding the study of varied processes of knowledge in enhancing the mental states of individuals [17]. Given the fact that knowledge is conceptualized in this study as an individual's mental state of content, with this involving frameworks and routines, then this reveals that employees can work on varied tasks, acknowledging that there are no differences between explicit and tacit knowledge. However, the focus, in this case, lies in the identification of various types of knowledge required within the manufacturing industry in increasing the skills and competency of workers.

C. Knowledge Management at the Individual Level

The understanding of the fact that knowledge remains a fundamental organizational asset that enables firms to achieve their competitive advantage gives ways through which the management of such knowledge can be made and

used. It, therefore, remains essential to reach a consensus that since valuable resources within an organization reach need to be efficiently managed to achieve sustainability and competitive advantage. However, a problem looms id this phenomenon is studied without a generalized agreement regarding how knowledge may be conceptualized before its management. As revealed by literature in regards to the conceptualization of knowledge, it is assumed that some of the contents of an organization may be considered as processes [6]. On the other hand, knowledge can equally be regarded as a vital; ingredient or characteristic of humans or instead characterized as an organizations property. This, therefore, explains the reason why knowledge can be viewed as either explicit or implicit. In as much as other variations are in existence as established in the two themes regarding how knowledge can be conceptualized, it is essential to note that there are different ways through which knowledge may wrought different implications if appropriately managed within an organization.

From an individual point of view, a combination of internal and primary processes in which several synergies exist in the creation of new knowledge remains fundamental. In other words, socialization reveals that humans actively engage in the sharing or instead access to further information from different people. The externalization process, therefore, involves ensuring that what is explicit or rather what an individual may know is considered as fundamental in the sharing of knowledge in as much as this may be achieved through a process of socialization or preferably during the application of the knowledge. On the other hand, internationalization equally involves the assessment as well as the assimilation of an individual's knowledge. Similarly, it is essential to note that the management of knowledge mainly consists of the creation of knowledge, the sharing of the same knowledge, the access to the acquired knowledge, and the capturing as well as the application of the interrelated knowledge. If the individuals are treated as the primary sources of the produced knowledge, then it is imperative to note that the effects of the application, as well as the sharing of this knowledge, may be considered as spiraling within the organizational level and among groups [1]. This, therefore, establishes the essence of understanding how the individuals can play a role in the management of the knowledge and in taking in the strategic roles. Undertaking an organization as a single unit of analysis in this case may fail to take into consideration the fact that knowledge within an organization is mainly created through the connections and interactions between individuals, with this resulting in the provision of guidance regarding the manner in which the management of such knowledge may significantly influence the learning process.

IV. EMPIRICAL EVIDENCE

A. Global Evidence

The manufacturing industries knowledge management has been developed in the management of information, data, and knowledge within an organization and employing this within the functions of organizations within this sector to gain competitive advantage and innovative products in the market. As alleged in a research study conducted by Cusumano (2011) on Toyota, the researcher revealed that Toyota Motor Corporation had achieved considerable growth in as much as there are several challenges it inhibited in its expansion and management. Toyota only manufactured cars in Japan and exports its products in other countries, but as a result of globalization and the ever-increasing demand of its products, the company resorted to operating in different foreign markets. In increasing

its operations base, the company experienced several challenges concerning its management and resources. In resolving this challenge, the company incorporated the use of knowledge management since the company discovered this approach would be useful in increasing its innovative nature. The company's operations grew in a significant manner through the inclusion of an advanced strategy, such as lean production and total quality management. These approaches assisted Toyota Corporation to achieve its place in the market. Additionally, the company took another approach of knowledge and knowledge management in the management of its employees. Toyota understood the need of managing its organizational knowledge within the functions of the organization and adopting knowledge management approaches such as the initiation of knowledge-sharing networks and the inclusion of tacit knowledge in the management of its features.

Toyota Motors management established the need for knowledge creation as not only aggression of information but as a distinctive human resource process that cannot be replicated or decreased. The company, therefore, alters its information and data that it uses in collecting, summarizing, organizing, synthesizing and arriving at decisions [3]. The management of Toyota takes cognizance of an effective management knowledge that ensures the company creates knowledge, shares knowledge, secures the collected knowledge in its management functions. The functions rely on the company's capacities that are developed with the aid of significant knowledge triggers that include the introduction of a knowledge vision within the company, the handling some of the conversations within the organizations, displacing the organization's reformers, establishing the company's appropriate context and lastly globalizing its local knowledge. Toyota consequently introduced these knowledge enablers to provide evidence in its knowledge management approaches. In as much as the company adopted practical approaches towards the management of its knowledge and how this knowledge is shared, the company was not in a position of effectively managing its knowledge among its resources. However, the company is currently in different markets but is not in a position to improve its production process efficiently because of the lack of knowledge management and sharing.

Toyota's management failed to go through the fundamental elements of knowledge sharing that remain some of the key drivers in the firm's innovative processes. To attain success in this age, it is essential for the leaders in the company to incorporate intellectual capital that ensures the company creates knowledge and shares this knowledge within its functions on an international basis [15]. The company needed to incorporate effective knowledge networks and knowledge sharing aspects within its functions. In any case, the organization adopts these approaches, and it can resolve some of the related issues that affect how knowledge is developed and shared, thus rendering the company in a competitive and innovative stage.

To successfully execute its operations, Toyota Motor's Corporation needs to improve its knowledge management approaches to be innovative. Without consideration of this, the company may encounter challenges in managing its leadership position as an innovator of effective products that meet the needs of the market [15]. This would require the company to introduce an effective knowledge management plan in delivering its substantial advantage of knowledge management within its business operations. Given the fact that the new markers are currently focused on a knowledge-based form of economy, knowledge is therefore considered as a cardinal asset in the achievement of a firm's success among other assets that include capital, properties, materials, and machinery. Through a successful approach directed towards capturing knowledge, sharing, and creating opportunities for its use, industrial

organizations remain at a better state of improving the process of learning in a bid to enhance their performance while equally creating possibilities to attain their competitive advantages. An organization learning the process, therefore, relies on its ability to engage in the collection and the integration of knowledge, behaviors, and skills which can enhance the process of learning and improving performance.

B. Local Evidence

On the other hand, Microsoft Corporation remains one of the leading software developers specialized in the design and the development of personal computer software, systems, and applications. The organization equally engages in the publishing of multimedia titles and published books while on the other hand producing their hybrid computers, electronic games, e-mail services and portable media players. One of the essential aspects that the company needs to put into consideration is how knowledge can be improved within the functions of the company, an element that can only be achieved through knowledge management as used within the organization's management tool [5]. Additionally, Microsoft Corporation needs to understand the aspect of intellectual capital to improve its knowledge management practices. The management team of the company needs to realize that knowledge management remains a vital element within the broader concept of intellectual capital since this element is all about intellectual capital. Intellectual capital can be considered in two primary aspects that include knowledge strategy and measurement. Strategy, in this case, entails the formation and utilization of the acquired knowledge and the association between value creation and knowledge development. The element of intellectual capital that constituted in measurement involves the development of new information systems that may be used by the organization to measure its non-financial data and other traditional financial data proficiently.

The management of Microsoft Corporation, therefore, needs to make attempts directed towards establishing how knowledge is created and leveraged into the value of the organization. Through the management of intellectual capital, the company needs to enhance its existing knowledge management approaches and ensure that the flows in knowledge management are improved. This will enable the organization to incorporate knowledge management as an effective management tool that is significant in making it effective within the business aspects of the organization. Knowledge management is considered as an effective management tool that is comprised of two primary elements that include: knowledge as an information handling tool and as a strategically management tool. The management of knowledge as a strategic and operational management tool, the company will be in a position to increase how it shares knowledge and enhances its organizational learning within its business processes. To implement effective approaches that would enable Microsoft Corporation's structure and procedures that would support its ability to be innovative, it is essential to ensure that the company.

Microsoft Corporation's efforts to implement a knowledge management strategy involve the company's approach to incorporating effective communication approaches. To successfully implement this approach, Microsoft needs to ensure it includes effective communication approach that is flexible to adapt to some of the changes in the company's communication patterns during its time of business decisions. A well-developed communication approach will help the company to increase how it shares knowledge and establishing a learning organization within the company. To successfully implement the knowledge management strategy, Microsoft Corporation, there is a need for the management of this company to initiate a support system for its top managers [10]. This, therefore,

requires the management team of this company to promote procedures that will incorporate the element of knowledge sharing and learning within the organization. On the other hand, the management needs to set-up knowledge networks that support the company's innovative activities, an element that will enable the company to develop a successful knowledge management approach.

The next element in the implementation and development of an efficient knowledge management approach in Microsoft is the inclusion of efficient methods of recognizing people and cultures. The integration of knowledge management is associated with different people who reside from different cultures and who have diverse knowledge that may improve the company's innovative strategies. On the other hand, the management of Microsoft should develop an efficient association in its knowledge management strategy and implementation that includes people from different cultures. Companies that concentrate on culture and people are in a position to achieve their goals as compared to organizations that only focus on technology [4]. Microsoft should consider this element since it will enable the organization to be proficient in implementing its knowledge management strategy. Understanding that people and culture are essential in the development of knowledge that thrives is necessary for the company. On the other hand, Microsoft needs to consider approaches aimed at improving its existing knowledge management practices through the inclusion of creative approaches that are linked to its organizational strategy. As a result of this, the company will be in a position to maintain its competitive position, thus supporting its innovation.

Microsoft also needs to develop knowledge networks that would enable the employees to learn from each other and maximize their knowledge sharing approaches. Through the development of knowledge networks, the company will be able to solve some of the challenges it encounters in sharing knowledge, thus becoming a learning organization.Besides this, Microsoft Corporation needs to consider creating incentives that effectively share and implement knowledge within the organization. Currently, the company's reward system fails to support the culture of knowledge sharing; an aspect that points out to the need of making changes in improving the company's challenges in relation to knowledge sharing. The management team of the organization needs to develop an effective reward system that encourages the employees to incorporate their expertise in understanding the essence of knowledge management. All the aspects of the company that are related to the organization's employees and how knowledge is shared should be described to the company's reward system within the organization's structure. It is, therefore, necessary for Microsoft Corporation to ensure that it effectively executes its operations, an aspect that will require the company to improve its knowledge management approaches to be innovative [4]. Without consideration of this, the company may encounter challenges in managing its leadership position as an innovator of effective products that meet the needs of the market. This would require the company to introduce an effective knowledge management plan in delivering its substantial advantage of knowledge management within its business operations.

V. CONCLUSION

As revealed in this study, the potential-industrial market or environment is currently viewed as significantly different in several ways. In this age and time, organizations increasingly consider knowledge as a pivotal ingredient in the achievement of their competitive advantage. Organizations within the manufacturing industry mainly gain new knowledge from an external environment or through boundary sensors and engage in the generation of new knowledge through varied activities. As different individuals and practices engage in the management of knowledge

as well as the factors that significantly impact these procedures, efficient interventions directed towards the promotion of these practices among employees is incorporated. In this case, gaining an understanding on the extent to which innovation or rather information technology significantly impacts the worker's knowledge management procedures, therefore, plays a crucial role in enabling organizations to engage in the evaluation of the merits established in employing different systems that play a vital role in supporting these procedures. However, given the case-based illustrations and the anecdotal value regarding the consideration of an organizations competitiveness from a knowledge-based purview, there are significant claims from empirical studies that support these sentiments. Knowledge management (KM) currently remains a fundamental issue in an organizations business strategy. KM is therefore considered as a critical aspect of an organization given the fact that its proponents radically complement the business functions and activities of an entity. Given the fact that the new markers are currently focused on a knowledge-based form of economy, knowledge is therefore considered as a cardinal asset in the achievement of a firm's success among other assets that include capital, properties, materials, and machinery.

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