

Examining the Impact of Strategic Learning on Strategic Vigilance- Empirical Study on Selected Companies Operating in the Petroleum Sector, Egypt

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Abstract

The complexity and unpredictability of the modern corporate environment mean that yesterday's ways of thinking and management techniques are unable to meet the demands of the present or the future. Businesses need to ensure the continuity of their operations and achieve a leading position in their industry by embracing innovative strategic management concepts such as strategic learning and strategic vigilance. This study aims at investigating the relationship between strategic learning and strategic vigilance with reference to selected international petroleum companies operating in Egypt. One primary hypothesis was constructed, from which four sub-hypotheses were derived. Both qualitative and quantitative methods were adopted. Primary data was collected through an online questionnaire. Data was analyzed using a set of statistical techniques. A significant relationship between strategic learning and strategic vigilance was concluded. Considering the findings, a group of recommendations and directions for future research were presented.

Keywords

Strategic learning; strategic knowledge creation; strategic knowledge distribution; strategic knowledge interpretation; strategic knowledge implementation; strategic vigilance; environmental vigilance; technological vigilance; commercial vigilance; and competitive vigilance

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1. Introduction

Considering globalization, intense competition, and informatics, the globe is currently undergoing significant socio-economic and political changes that have created an environment marked by dynamic changes, uncertainty, and threats (Singh, 2022). In the meantime, an organization that engages in continuous learning and possesses information and knowledge will be able to understand and predict the surroundings, allowing it to make early adjustments in response to changes. Thus, a knowing organization can maneuver intelligently and sustain growth and development (Choo, 2001). Organizations need to develop new business values, think differently, and develop new standards and behaviors. They should employ new practices and take advantage of modern concepts, principles, systems, and approaches, to cope with the constantly changing environments (Lesca, 1994; Gagnon et al., 2015; Goble, Bier, & Renn, 2018; Hameed, 2019; Mahmood, Faris, & Al-Dahan, 2020; García-Carbonell et al., 2021).

Considering these challenges, organizations are forced to use strategically renewable tools. Those challenges have led to the emergence of several modern intellectual concepts, such as strategic vigilance. According to contemporary literature, strategic vigilance is considered a cornerstone for most organizations to reach a complete understanding and recognition of all environmental events (Shalakah et al., 2019). Strategic vigilance is needed at both the individual and organizational levels. The first line of defense against a prospective attack is vigilance; it keeps the organization aware of potential risks and prepared for them, thus minimizing, or preventing any consequences (Suzuki & Monroy, 2021).

The core idea of the current study was initially recognized through the researcher's awareness of the dynamic nature and challenges of the business activities of international oil companies (IOCs) operating in Egypt. IOCs work in an environment characterized by rapid development in various fields. This necessitates their ability to secure their sources of information, interact flexibly, and make successful managerial decisions promptly. This can be accomplished by providing immediate follow-up and constant anticipation of changes. They also need to adopt a culture of communication and learning, to continuously develop their techniques and strategies to improve their performance, ensure the continuity of their operations, assure their survival, and achieve a leading position in their industry. Concurrently, most business organizations worldwide are currently dealing with the extremely difficult circumstances brought on by the COVID-19 pandemic and its mutations, food and energy crises, wars, and inflation. These escalating conditions are forcing companies to revise their plans, strategies, and goals to be able to face all these dynamic disturbances and changes in a way that guarantees their survival and achieves a distinct competitive position among their competitors.

A literature review was the subsequent step relied upon for detecting and exploring the main study constructs. Scanning relevant literature resulted in spotting several gaps, and taking advantage of findings and recommendations, detecting areas of contribution of the current study, concerning its main study constructs. Literature

review revealed that strategic management literature is nearly saturated with numerous studies focusing on improving a company's performance by adopting modern management techniques. So far, it has been revealed that these two concepts have not been intensively studied, or have been addressed theoretically, with no empirical findings. Also, there is a scarcity of studies focusing on the concepts of strategic learning and strategic vigilance together or that were applied within the international companies operating in the Egyptian petroleum sector.

Following the literature review, a qualitative study (pilot study) through face-to-face interviews with practitioners of key decision-makers from different significant managerial levels was conducted. Personal interviews revealed the need for learning and developing the company's strategic knowledge as well as the need for monitoring the environment and predicting its challenges. To overcome all of their resulting disturbances, such as uncertainty, complexity, ambiguity, not well-defined problems, unavailability of information, non-clearance of objectives, and un-precise alternatives of assessment, so as to assist their companies in adapting to those challenges, responding swiftly to potential issues, developing policies, seizing opportunities, and maintaining their market share. As such, the pilot study indicated the need for strategic learning and strategic vigilance, thus ensuring the feasibility of proceeding with the current study to come up with practical recommendations and conclusions.

Therefore, the study problem is to empirically investigate the relationship between these intellectually significant constructs, strategic learning, and strategic vigilance, as the study's primary objective, applied to selected IOCs operating in Egypt, through an in-depth study based on a designed conceptual model, to provide a better approach to the chosen topic.

Thus, this study is considered a scientific quest to find an answer to the formulated main question, which implicitly expresses the study problem, to gain a deeper understanding of the topic under study. **What is the type of relationship between strategic learning and strategic vigilance within the companies under study?**

Other objectives for the study include testing the developed main hypothesis; exploring the availability of the variables of strategic learning and the types of strategic vigilance and their level of implementation within the companies under study; developing a cognitive and theoretical framework for both constructs by following the specialized theoretical literature path, followed by empirical investigation. In addition, measuring the selected study constructs quantitatively and assessing their consistency and differences with previous efforts of past studies; attempting to minimize the identifiable gap between academics and practitioners, by shedding more light on key academic terms, trying to reach a realistic model that links these two terms in a real context; coming up with a distilled set of recommendations based on the study findings; and presenting the empirical findings of the current study to officials in the Ministry of Petroleum and Mineral Resources (MOPMR) and officials at the selected IOCs under study as a guiding tool that may supports companies in developing their business performance; achieving a distinguished position within the petroleum sector, both in

the local and international markets, by adopting and boosting contemporary strategic management techniques; and ultimately advancing economy.

The current study further elaborates on the strategic roles of those concepts and assesses their application level within the companies under study.

2. Literature Review & Study Hypotheses Development

2.1 Strategic Learning

In today's turbulent business environment, an organization's success extensively depends on its ability to acquire and process relevant information (Temtime, 2004). The ability to adapt to an unpredictable environment depends on fast learning and obtaining information before competitors, which will support any organization in exploring new ways to acquire a competitive advantage (Shahri, 2022). Organizations also need to respond to events and information faster than structured strategies permit. Thus, within this dynamic, rapidly evolving environment, learning strategy allows businesses to be agile by allowing them to identify market changes and seize opportunities promptly (Kenny, 2006; Doz & Kosonen, 2010). Agile and flexible strategic learning plans support small firms to gain competitive advantages (Learning for the Future, 2020). The interest in strategic learning arose from the critique of traditional strategic planning studies (Mintzberg & Waters, 1985). Scholars debated the formality and logic of the strategy process (Mintzberg & Lampel, 1999) and argued that the capability to craft and reformulate strategies constantly is the core of any organization's success (Voronov & Yorks, 2005).

The concept of strategic learning implies that organizations need to recognize the imperative of change, take advantage of strategic opportunities, and integrate new and better ways of working into their competitive repository (Tahershnaier & Jasim, 2020). As a result, organizations require strategic learning because continuous learning develops organizational knowledge that directs them on how to act based on the available information, allowing them to make the appropriate decisions and actions to adapt during challenging periods (Quansah & Hartz, 2021). According to Anderson et al. (2009), strategic learning is an indicator of the organization's capability to obtain knowledge and redirect its strategic path. As per Sirén et al. (2017) strategic learning is the long-term adaptability of an organization, enabling it to break away from its current strategic direction and renew its core capabilities. Strategic learning provides firms with knowledge of a strategic value, which enables them to build, develop, extend, update, and modify their operating strategies so that they can create a sustainable competitive advantage (Gupta & Bose, 2019).

2.1.1 Processes of Strategic Learning

Strategic learning is a complex, multi-dimensional construct that is expressed through four sub-processes of gaining strategic knowledge: creation, distribution, interpretation, and implementation (Sirén, 2012; Sirén et al., 2012; Idris & AL-Rubaie, 2013; Sirén et al., 2017). Scholars commonly define Strategic Knowledge Creation as examining the external environment to recognize important events or issues impacting

an organization (Thomas et al., 2001). Creative search aims to lead the company into new markets and technological experiences, resulting in novel knowledge with strategic value at the group and organizational levels (Sirén, 2012). Strategic Knowledge Distribution is defined as the internal dissemination of acquired strategic knowledge at the individual level within the organization between individuals and groups through conversations and interactions. Newly acquired strategic information will remain personal until it is put into a social context through knowledge distribution (Nonaka, 1994). This process is known as social exchange (Jerez-Gómez et al., 2005).

Strategic Knowledge Interpretation is the process by which recently gained information is given new meanings and develops a shared understanding (Huber, 1991). This is the strategic sense-making of the cognitive process (Pandza & Thorpe, 2009). Strategic knowledge interpretation identifies essential information and improves the company's strategy and performance (Alhimyaria & Al-Murshidi, 2020). While Strategic Knowledge Implementation is institutionalizing the strategic knowledge base that was developed through earlier processes of strategic knowledge creation, distribution, and interpretation into the organization's processes, frameworks, procedures, structures, strategies, and techniques; collectively called organizational memory, in which the prior knowledge base can be retrieved in support of any future decision-making (Huber, 1991; Walsh & Ungson, 1991).

2.2 Strategic Vigilance

Uncertainty is now the theme of the surrounding environment (García-Carbonell et al., 2021). Information on the internal and external environment has become increasingly plentiful, complicated, and renewable rapidly (Allawi, 2021). Consequently, in today's complex business reality, companies should consider a method for regular monitoring of events within their business environment to guarantee quality, regulation, and uniformity of their activities and operations (Savescu, 2014). Strategic vigilance is a defense mechanism that comes up with new insights on how to properly allocate an organization's available resources. A vigilant organization is strategically flexible, which makes it able to respond properly and sufficiently depending on the nature of the occurring changes, complexities, and challenges in its business environment. Being strategically vigilant is an indicator of a healthy organization (Tende & Onuoha, 2020). Al-Khasswneh (2023) indicates that the output of strategic vigilance processes enables the organization to become smarter and attain a high degree of strategic intelligence.

2.2.1 Strategic Vigilance Emergence

Based on cultural and historical factors, strategic vigilance has taken on various forms over time. The concept was seen from the perspective of every country's culture. It can be said that monitoring the surroundings is not seen as a methodology but rather as a culture (Karima and Zohra, 2021). Cohen (2004) also clarified that environmental surveillance, strategic vigilance, and strategic intelligence are different terms derived from the concept of scanning that has evolved over several decades after the incessant

changes in the business environment. The origins of vigilance are rooted in looking for, inspecting, and screening information to carry out spying for military purposes and encoding messages. During wars, armies sent groups to the invaded areas to track the events. Thereafter, this concept moved to economics at the end of the 1950s, where organizations began to apply it (Ramly, 2017). Then, the concept becomes more common in the language of economics and business (Hermel, 2001).

Strategic vigilance appeared in Japan in the middle of the nineteenth century, when it applied strategic vigilance to intelligence and monitoring as a collective resource. The first signs of the concept appeared among the Japanese after World War II, in their endeavor to recover their economy. Their culture of cooperation helped them establish companies abroad, so they created a network for exchanging information across Japan through telex communications (Dhaoui, 2008). The concept appeared in the United States of America at the end of the 1950s. It was associated with competition. Whereas in France, strategic vigilance did not appear until the end of the 1980s and was associated with information systems. Both countries started to pay attention to strategic vigilance to face outside threats, especially from Japan (Dhaoui, 2008; Mahdi, 2019).

Lesca (1997) and Cohen (2004) stated that the Anglo-Saxon countries preferred to use the terms environmental scanning, and competitive intelligence over strategic vigilance. Where French literature used terminologies such as vigilance, surveillance, veille, strategic vigilance, strategic intelligence, and economic intelligence (Figure.1) (Dhaoui, 2008).

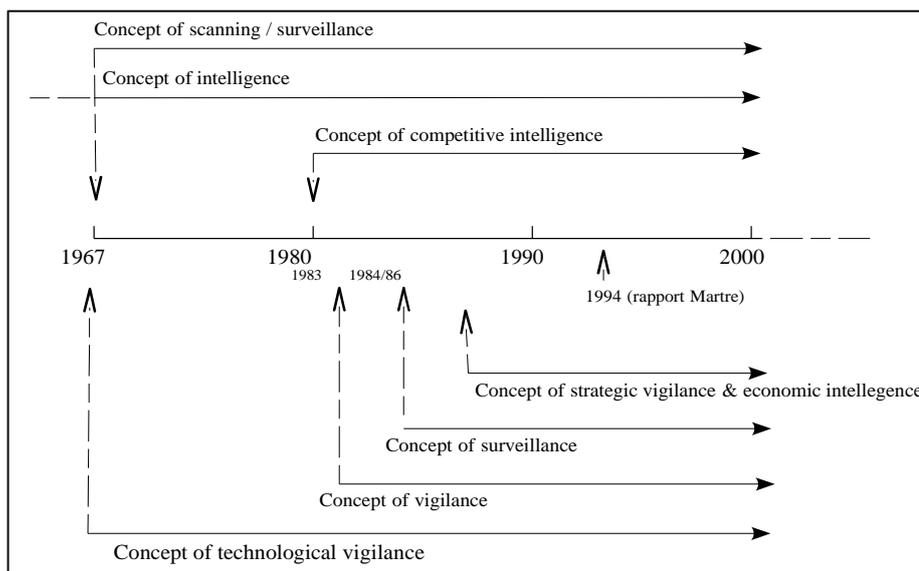


Figure-1: The Evolution of Anglo-Saxon and French-Speaking Terminologies of Economic Intelligence

Source: Cohen (2004)

2.2.2 Definitions of Vigilance (Linguistically)

The word vigilance was taken from the Latin term *vigília/vigilantia* which means wakefulness or staying up (Chalus-Sauvannet, 2000). Oxford Learner’s Dictionaries

define the word vigilance as “Great care that is taken to notice any signs of danger or trouble” (Oxford Learner’s Dictionaries, n.d., vigilance). While according to Almaany dictionary, vigilance means “The process of paying close and continuous attention” (Almaany Dictionary, n.d., vigilance).

2.2.3 Definitions of Vigilance (Idiomatically)

Vigilance is a continuous and recurring activity that aims at constantly monitoring the environment to anticipate developments (Hermel, 2001). Blanco et al., (1997) clarified that vigilance refers to monitoring all the organization’s variables, to help it make decisions, especially those that need more accurate strategic information.

2.2.4 Definition of Strategic Vigilance

Strategic vigilance has several definitions among management researchers. Researchers and interested parties in business administration literature encountered many concepts that are either near or related to strategic vigilance and sometimes complement it. However, it is noticed, in the literature, that there is confusion between strategic vigilance with other terms such as environmental scanning, organizational vigilance, early warning systems, business intelligence, economic intelligence, and competitive intelligence. Considering this, the following are some of the most important definitions of strategic vigilance. Strategic vigilance is a tool that enables companies to minimize environmental uncertainty by sensing weak signals, i.e., the early warning signs so that a company can be prepared for any incident by obtaining forward-looking information. Subsequently, the perception of weak signals allows the company to avoid surprises, so it can respond quickly seizing opportunities or countering threats (Ansoff, 1975). Strategic vigilance is an informational process through which a company seeks actively environmental information, detects, and processes the warning signals of events likely to influence its sustainability. The goal is to support the strategic decision-making process, open a window of opportunity, and reduce uncertainty (Lesca, 1994).

Strategic vigilance is described as an accurate information system through which the organization aims to form a comprehensive view of its internal and external environment through strategic monitoring of changes and collecting a huge amount of data from internal and external sources. The goal of this system is to reduce uncertainty, analyze current events, and predict future changes. Accordingly, it will be able to provide real-time and accurate information to raise organizational knowledge and support decision-makers (Chalus-Sauvannet, 2000).

Providing the necessary information through strategic vigilance plays a vital role in many aspects, as this information represents a real strength for the organization after being translated into a distinct ability to anticipate, to achieve the organization’s goals and qualify it to compete (Jalil & Ahmed, 2020). It is also defined as a continuously observing and monitoring the environment to follow up on all changes and interpret the signals, this way, organizations would be able to adapt to those changes and take the necessary measures (Omer, 2019; Alshaer, 2020) for better-facing competition (Khalil, 2019). Strategic vigilance is also seen as an integrated system for monitoring

and searching for information in various aspects of an organization's environment (commercial, competitive, environmental, technological), and interpreting it to enable the organization to make strategic decisions and achieve long-term excellence (Karima & Zohra, 2021).

Drawing from the aforementioned definitions, the current study proposes that strategic vigilance can be defined as an ongoing, voluntary, and organized process of monitoring the changes occurring in the surrounding environment of an organization and searching for anticipatory information of strategic value; then interpreting the collected information and disseminating it when needed to support decision-makers in constructing strategic decisions safely and confidently in a timely manner, to seize promising opportunities and avoid potential threats; so organizations can compete eligibly.

2.2.5 Types of Strategic Vigilance

Given that strategic vigilance can depend on an organization's operations, research field, or strategy approach, the opinions of the researchers who addressed it differed widely in their sorts (Dumas, 2004). It was found that there are four main types of strategic vigilance related to the external environment, which are: environmental vigilance, technological vigilance, commercial vigilance, and competitive vigilance (Hermel, 2001; Caron-Fasan & Lesca, 2003; Dhaoui, 2008). Commercial Vigilance allows a company to monitor its relationships with suppliers and customers by gathering, evaluating, and disseminating information regarding growth rates and advanced skills in the market. With this kind of attention to detail, the company can identify its advantages and disadvantages in the marketplace and work to enhance performance, meet customer demands, and preserve its competitive edge (Tamboura et al., 2007). It also allows the organization to find new markets and offer new products (Dawood & Abbas, 2018; Zaki, 2019). Competitive Vigilance is the act of continuing research for, collecting, processing, and distributing needed information concerning the organization's competitors to monitor current competitors that the organization has direct and indirect interaction with; or even the potential competitors, by mainly paying attention to their behavior and anticipating their future actions (Martinet & Ribault, 1989; Qiu, 2008; Ben Ali, 2017; Dawood & Abbas, 2018).

Technological Vigilance is defined as an organization's systematic and organized effort to observe, receive, analyze, disseminate, and retrieve timely and comprehensive information about certain economic, technological, social, or business events in well-defined areas of interest that might involve an opportunity or a threat. Through the appropriate and precise delivery of information and communication within an organization, technological vigilance facilitates the creation of intelligence (Savescu, 2014). Technological vigilance has become one of the most critical tactics that the company should employ to keep up with its competitors and avoid falling behind (Amayreh, 2021). Where Environmental Vigilance can be defined as, the process of investigating, collecting, and processing all the organizational external, uncontrollable information related to the macro-level environment such as legislation, laws, politics, cultural, social, and demographic change, which necessitates the continuous renewal

of activities (Martinet & Ribault, 1989). Environmental vigilance is sometimes known as ocean vigilance, comprehensive vigilance, or social vigilance. It monitors all related environmental events, changes, and developments which may affect organizations' activities (Qiu, 2008; Dawood & Abbas, 2018; Mahmood, Faris, & Al-Dahan, 2020).

It should be noted that the four common types of strategic vigilance are not mutually exclusive. Although each form of vigilance has its own competency, it is feasible for those types to interact. For example, competitive vigilance will be close to technological vigilance if more attention is paid to competitors' products and industrial equipment (Hermel, 2001).

2.3 Similarities and Differences between Current Study and Past Studies

Science is a cumulative process. Therefore, building on a growing body of literature and following a comprehensive review of a set of existing studies on strategic learning and strategic vigilance that linked it to other constructs, it is revealed that past studies agree on some aspects of the current study and differ in other aspects:

A literature review revealed that strategic learning has been a topic of interest for both academics and practitioners in recent years (Kuwada, 1998; Thomas et al., 2001; Jerez-Gómez et al., 2005; Anderson et al., 2009; Sirén, 2012; Idris & AL-Rubaie, 2013; Moon & Ruona, 2015; Gupta & Bose, 2019; Christopher & Anayochukwu, 2020). In addition, several studies agreed that strategic learning is a multi-dimensional construct and showed that it manifests through four sub-processes represented in the strategic knowledge creation, distribution, interpretation, and implementation (Sirén, 2012; Idris & AL-Rubaie, 2013; Sirén & Kohtamäki, 2016; Sirén et al., 2017; Alhimyaria & Al-Murshidi, 2020). Giving a closer look into the literature, it is found that the term also has several concepts either near, related, or complementing it including learning organization (Senge, 1990; Kenny, 2006), collective learning (Garavan & McCarthy, 2008), organizational learning (Huber, 1991; Nafei, 2016), organizational learning capability (Jerez-Gómez et al., 2005; Hsu & Fang, 2009; Hooi, 2019). Thus, the operationalization of the strategic learning concept still needs further investigation.

Similarly, it was found that some studies tried to provide a meaningful understanding of strategic learning based on reviewing the existing body of literature, models, and processes by translating and interpreting the related literature theoretically without empirical testing. Most of these studies were case-based and conceptual (Kuwada, 1998; Thomas et al., 2001; Moon & Ruona, 2015; Shahri, 2022). Nevertheless, the theoretical framework of some studies dealt with strategic learning within a limited context by only describing the concept or giving some limited definitions related to the specific context of the study without mentioning any of its processes (Gupta & Bose, 2019; Tahershnaier & Jasim, 2020; Kelliher et al., 2020). Despite the plentiful studies that dealt with the concept of strategic learning so far, there are few studies that applied the concept within the Egyptian petroleum sector. As most of studies covered other sectors or certain industries such as the Spanish chemical industry (Jerez-Gómez et al., 2005), Southwestern Pennsylvania manufacturing firm (Anderson et al., 2009), Finnish software companies (Sirén, 2012), Jordan ELBA

manufacturing (Idris & AL-Rubaie, 2013), Nigerian Aviation sector (Christopher & Anayochukwu, 2020), Indian firms (Singh, 2022). Thereby, the current study approached literature that directly addressed the concept of strategic learning with all its processes. Besides, it presents the last of what was written in this field, supported by empirical evidence in a different context.

As for strategic vigilance, there is a considerable agreement among the existing literature that environmental vigilance, technological vigilance, marketing/commercial vigilance, and competitive vigilance are the most common types of strategic vigilance within contemporary organizations (Martinet & Ribault, 1989; Caron-Fasan & Lesca, 2003; Omer, 2019; Zaki, 2019; Hameed, 2019; Khalil, 2019; Alshaer, 2020; Mahmood, Faris, & Al-Dahan, 2020; Karima & Zohra, 2021; Allawi, 2021; Jalod et al., 2021; Al-Noori & Al-Janabi, 2022; Al-Khasswneh et al., 2023; Al-Aasadi, 2023). These four types are consistent with the types selected for the current study.

Digging into the existing literature, it is found that there is no agreement on a single conceptually unambiguous definition without referring to other terminologies, e.g., economic intelligence (Marti & Martinet, 1995), competitive intelligence (Saayman et al., 2008), organizational vigilance (Schoemaker & Day, 2019), strategic alertness (Tende & Onuoha, 2020). Thus, the current study tried to focus on the literature that directly addressed the concept of strategic vigilance and illustrates the ambiguity in the other interrelated terms. Few studies have dealt with strategic vigilance in a limited context as one component of another construct. They only described the concept giving some limited definitions related to the specific context of the study without mentioning any of its types such as (Schoemaker & Day, 2019; Hameed, 2019; Trend & Onuoha, 2020; Rumman, 2022). Thereby, the current study approached the literature that directly addressed the concept of strategic vigilance and covered all its common types.

Researchers have explored the impact of strategic vigilance on achieving goals for the organization, e.g., quality of management decisions (Khalil, 2019); organizational ambidexterity (Alshaer, 2020); business continuity management (Rumman, 2022); crisis management (Al-Noori & Al-Janabi, 2022) and so for other scholars. They have dealt with strategic vigilance as an independent construct and rarely identified the other constructs that promote the existence of strategic vigilance within the organization. In another context, some studies have selected strategic vigilance as a mediator construct, e.g., (Hameed, 2019; Amayreha, 2021; Thneibat et al., 2023). On the other hand, rare studies have dealt with strategic vigilance as the dependent construct, e.g., (Qatie & Alchalabi, 2021).

Despite the plethora of existing studies that dealt with the concept of strategic vigilance, as far as we can tell, there are rare studies that applied strategic vigilance within the context of international companies operating in the Egyptian petroleum sector. Most of the studies covered other sectors or a specific industry such as banking sector (Shakatreh et al., 2021), the educational sector (Abdel Hamid, 2021), the pharmaceutical industry (Zaki, 2019), manufacturing industries (Tende & Onuoha,

2020; Thneibat et al., 2023), tourism industry (Al-Aasadi, 2023), and insurance companies (Al-Khasswneh et al., 2023).

Based on this comprehensive analysis of several recent studies in the domains of strategic learning and strategic vigilance, as well as the insights gained from the exploratory investigation. Therefore, the current study hypothesizes that practicing variables of strategic learning promote strategic vigilance within the company. Strategic learning was selected as the independent construct consisting of four variables, which are strategic knowledge creation, strategic knowledge distribution, strategic knowledge interpretation, and strategic knowledge implementation. Whereas, strategic vigilance was selected as the dependent construct, consisting of four types, which are environmental vigilance, technological vigilance, commercial vigilance, and competitive vigilance. One main hypothesis and four sub-hypotheses were developed to tackle the study problem:

H.1: There is a significant relationship between strategic learning and strategic vigilance in the company. Where Sub-hypotheses are:

H.1a: There is a significant relationship between the variables of strategic learning and environmental vigilance in the company.

H.1b: There is a significant relationship between the variables of strategic learning and technological vigilance in the company.

H.1c: There is a significant relationship between the variables of strategic learning and commercial vigilance in the company.

H.1d: There is a significant relationship between the variables of strategic learning and competitive vigilance in the company.

Figure (2) presents the designed conceptual model representing the developed hypotheses and the expected relationships between the independent and dependent constructs.

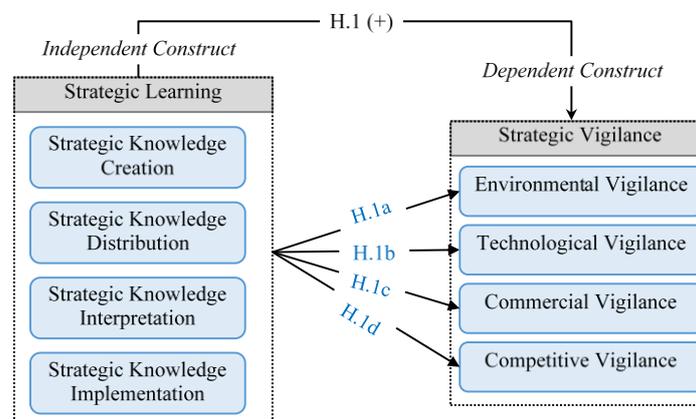


Figure-2: Study Conceptual Model

Source: Prepared by the Researcher

3. Methodology

To achieve the study objectives of investigating the potential relationship between strategic learning and strategic vigilance, the current study relied on a descriptive-analytical approach through two main study designs: an exploratory study followed by

a conclusive, descriptive study. The exploratory study was conducted relying on a broad literature review on strategic learning and strategic vigilance, followed by a pilot study through face-to-face interviews, and finally, reviewing secondary data about the Egyptian petroleum sector. The conclusive, descriptive design was used to describe the phenomenon, its nature, the relations between its constructs, and their directions. It presents some terms related to the study; describes data and population; and interprets the study findings presented in figures and tables, derived from the analysis of data to come up with conclusions and recommendations.

A concurrent mixed data collection approach (Triangulation) was employed, aiming to merge the description with the analysis, which enriches both the theoretical and practical sides. The current study is categorized as a deductive research which is used to reach specific conclusions based on a set of generic premises (Cooper & Schindler, 2014). The deductive process is used to empirically indicate whether the hypothesis developed will be accepted or rejected.

3.1 Population and Sampling

“The population is the entire group of people, events, or things of interest that the study is meant to investigate” (Sekaran & Bougie, 2016, p. 236). The target population is all international petroleum companies working under the EGPC entity, operating in the upstream stage (exploration and production) (MOPMR, n.d.). The study selected a subset sample from the study population for primary data collection. Since two strategic terms were selected for investigation, the sample unit is key decision-makers at different significant managerial levels (chief level, team leaders, department heads, GM, CEO, MD) who are currently working in different departments in the selected IOCs.

Non-probability, judgmental (purposive), and convenience sampling techniques were applied in collecting the primary data for different reasons, among which were: the lack of a sampling frame due to limitations of data accessibility. The purpose of this study is to draw the attention of officials working at the selected companies to realize the importance of applying these two concepts as modern, innovative strategic management techniques. As such, the results are not generalizable. Finally, time constraints, as well as the non-availability of representatives due to the COVID-19 pandemic and precautionary protocols applied at many IOCs, have forced companies to reduce workforce capacity, if they were not working from home.

3.2 Petroleum Sector Selection

Determining the field of application is of great importance, since selecting an appropriate sample, in terms of characteristics and size, contributes greatly to the accuracy of the results. Accordingly, selecting the petroleum sector as a field of application emerges from the pioneering role and positive impact of the petroleum sector as an essential pillar of the growth of the Egyptian economy. The dynamic nature of the IOCs' operating environment is consistent with the chosen constructs due to

their significant roles and strategic impacts on the companies' performance, which are in line with the ongoing IOCs' attempts to seek uniqueness, excellence, and competitiveness. Consequently, the selection of study constructs and their application in the petroleum sector is characterized by relative modernity, representing a field of exclusivity.

3.3 Data Collection Techniques

3.3.1 Pilot Study

Face-to-face, semi-structured interviews with individuals and groups have been undertaken as an initial step before sending the large-scale survey, through ten closed-ended and three open-ended questions that were previously formulated through scanning previous literature. Minor adjustments were made to the questions to match them with the context of the IOCs. The purpose of conducting the pilot study is to obtain extra information about the petroleum sector especially, that is difficult to obtain. Besides, exploring the existence of the study constructs within the real context and ensuring the feasibility of the study. In addition to identifying the terms used by the chosen samples to express the study constructs and selecting the relevant questions for a large-scale survey based on the participants' feedback, redundant and ambiguous items were eliminated or modified in minor ways. Also, ensuring that instructions are understandable, the wording of statements is clear, statement length is reasonable, and overall convenience is realized.

Face-to-face interviews revealed that the concepts of strategic learning and strategic vigilance are applied implicitly rather than explicitly within the activities of the IOCs under study, including all their known variables and types. Due to the nature of their business activities that distinguish them from other types of companies operating within the sector. This shows that the study's primary constructs are evident in the chosen field of application, confirming that this is the best field in which to conduct the study. Although in real context, companies do not use the academic title for the types of strategic vigilance, it is acknowledged that each type is adopted to varying degrees. It is also revealed that the distinction between similar terms is largely academic.

3.3.2 Large-Scale Survey

A cross-sectional survey through a self-administered questionnaire was applied as the main instrument for collecting the primary data. The online survey has been established and its link was sent to each representative of the target sample individually. Two reminders have been sent to ensure as many responses as possible. One hundred thirty responses were retrieved from the willing participants of the target sample.

3.4 Measurement of the Study Constructs

All the questions in the large-scale questionnaire were drawn from pre-established instruments of previous studies, which were tested for their validity and reliability, which is the scientific criteria for the instrument tools (Sekaran & Bougie, 2016). Moreover, all the questions were subjected to revision from the respected supervisor and statistical specialist to ensure that they were acceptable from academic and scientific perspectives.

All scale items were measured using a 5-point Likert scale interval measure, ranging from 1 for “strongly disagree” to 5 for “strongly agree”. Likert intervals allow for degrees of opinion (McLeod, 2019). As summarized in Tables 1 and 2.

Table-1: Strategic Learning Scale

Strategic Learning	Items	Source
Strategic Knowledge Creation	4 Items	Sirén et al. (2017); Zhao et al. (2020)
Strategic Knowledge Distribution	5 Items	
Strategic Knowledge Interpretation	4 Items	
Strategic Knowledge Implementation	4 Items	

Table-2: Strategic Vigilance Scale

Strategic Vigilance	Items	Source
Environmental Vigilance	5 Items	Saayman et al. (2008); Omer (2019); Zaki (2019); Khalil, (2019); Karima and Zohra (2021)
Technological Vigilance	5 Items	
Commercial Vigilance	5 Items	
Competitive Vigilance	5 Items	

4. Empirical Analysis and Hypotheses Testing

The data set was analyzed using various tools of SPSS V.25 and AMOS V.24 statistical program.

4.1 Measurement Tool’s Test

Scales tests of factor analysis, reliability, and validity are requisite steps undertaken before proceeding with the data analysis to gain confidence in the measurement tool to draw valid implications from the proceeding study findings.

4.1.1 Factor Analysis

The estimate of the variance in each variable is explained by the factors being studied (Cooper & Schindler, 2014).

Table 3 demonstrates that the component coefficient value of the questionnaire items (tables 1&2), ranged between 0.642-0.877. The initial list of the questionnaire consists of 37 items covering all the dependent and independent constructs but, two items were removed due to their low values of factor loadings (one item within strategic knowledge creation and the other item within competitive vigilance).

Table-3: Component Matrix of the Construct's Variables

Item(s)	Component Coefficient Value	KMO	Chi-Square Test	AVE
Strategic Knowledge Creation	0.825-0.853	0.707	116.174	70.976
Strategic Knowledge Distribution	0.735-0.831	0.746	252.414	59.113
Strategic Knowledge Interpretation	0.642-0.849	0.764	154.982	61.415
Strategic Knowledge Implementation	0.738-0.775	0.759	118.117	58.083
Environmental Vigilance	0.651-0.812	0.792	244.739	59.915
Technological Vigilance	0.731-0.877	0.818	258.206	61.901
Commercial Vigilance	0.777-0.849	0.851	306.117	66.481
Competitive Vigilance	0.758-0.843	0.727	159.247	62.007

KMO= Kaiser-Meyer-Olkin; AVE= Average Variance Extract

Moreover, the KMO “measure of sampling adequacy” was greater than 0.50. Also, there was a significant relationship between the statements of each variable at a confidence interval of 99%. The AVE of each variable was greater than 50% and ranged between 58.083-70.976. This indicates that statements explain the variable by 58.1%-71%. As a result of this test, we may infer that these statements accurately express and measure the latent variables of the study constructs.

4.1.2 Reliability and Validity

Table 4 shows that the Cronbach's α coefficient values of all the questionnaire items were acceptable. All the values for scales were ≥ 0.7 as a minimum score to meet the standard criteria. Table 4 illustrates that Cronbach's alpha ranged between 0.758-0.826 for the strategic learning questionnaire's elements and 0.792-0.869 for strategic vigilance, i.e., if we asked the same sample again, we would get the same responses with a percentage ranging between 75.8%-82.6% and 79.2%-86.9%, respectively. While the explicit validity coefficient ranged between 0.870-0.909 for strategic learning and 0.890-0.932 for strategic vigilance, ensuring that the respondents understood the items perfectly, with a percentage ranging between 87.0%-90.9% and 89.0%-93.2%, respectively.

Table-4: Cronbach's Alpha for the Study Constructs

Item	No. of Items	Cronbach's Alpha	Validity
Strategic Knowledge Creation	3	0.785	0.886
Strategic Knowledge Distribution	5	0.826	0.909
Strategic Knowledge Interpretation	4	0.789	0.888
Strategic Knowledge Implementation	4	0.758	0.870
Strategic Learning	16	0.913	0.955
Environmental Vigilance	5	0.827	0.909
Technological Vigilance	5	0.844	0.919
Commercial Vigilance	5	0.869	0.932
Competitive Vigilance	4	0.792	0.890
Strategic Vigilance	19	0.943	0.971

4.2 Descriptive Statistics

4.2.1 Descriptive Statistics of the Demographic Profile

Analyzing the information derived from the demographic section highlights the demographic characteristics of the target sample and illustrates the different perspectives and awareness of the sample regarding the study constructs and their application in the real context. The descriptive statistics of the demographic profile are shown in detail in Table 5.

Table-5: Descriptive Statistics of the Demographic Profile

Item	Frequency	Percentage
Age Group (Years)		
30-39	29	22.3
40-49	56	43.1
50-59	25	19.2
60-65	20	15.4
Educational Level		
Bachelor	67	51.5
Postgraduate	63	48.5
Nature of Current Position at Your Company		
First-Line Management	58	44.6
Middle Level Management	45	34.6
Top Level Management	27	20.8
Years of Work Experience		
Less than 5 Years	1	0.8
5-Less than 10 Years	3	2.3
10-Less than 15 Years	21	16.2
More than 15 Years	105	80.8
Total	130	100.0

4.2.2 Descriptive Statistics of Study Construct Regarding Demographic Items

Table 6 shows that the significance of the tests has a value greater than 0.05, so we accept the null hypothesis that there are no statistically significant differences between the sample’s responses regarding different items of the demographic profile and the study constructs.

Table-6: Descriptive Statistics of Study Constructs Regarding Demographic Items

Demographic Profile	P-value	
	Strategic Learning	Strategic Vigilance
Age Group	0.348	0.119
Educational Level	0.825	0.814
Current Position	0.791	0.991
Years of Work Experience	0.776	0.124

4.2.3 Descriptive Statistics of the Study Construct

Table 7 presents that the value of the arithmetic mean of responses is 3.757 for all the items of strategic learning’s variables, which differs from the expected mean of 4 at a significant level of 1% and a standard deviation of 0.660. The calculated T-test value reached $|-4.201|$ (greater than the tabulated value of 2.626). Also, it shows that

the coefficient of variation is 17.57%, which has a small value, indicating that the responses around the variables have consensus with an agreement of 82.43%, indicating that the sample has the awareness and agrees on the availability of strategic learning within their companies. This finding was one of the main objectives of the current study, which aimed at exploring the availability of the variables of strategic learning and their level of implementation within the selected IOCs operating in Egypt.

Table-7: Descriptive Statistics of the Variables of Strategic Learning

Item	Mean	Std. Dev.	t-test	CV
Strategic Knowledge Creation	4.074	0.806	1.052	19.79
Strategic Knowledge Distribution	3.574	0.845	-5.748	23.65
Strategic Knowledge Interpretation	3.662	0.809	-4.769	22.10
Strategic Knowledge Implementation	3.717	0.698	-4.615	18.79
Strategic Learning	3.757	0.660	-4.201	17.57

Std. Dev.= Stranded Deviation; CV= Coefficient of Variation

Figure (3) shows the sample average responses to the questions of strategic learning variables. The percentage of “agree” is 71.5%, 23.8% for “neutral”, and 4.7% for “disagree”.

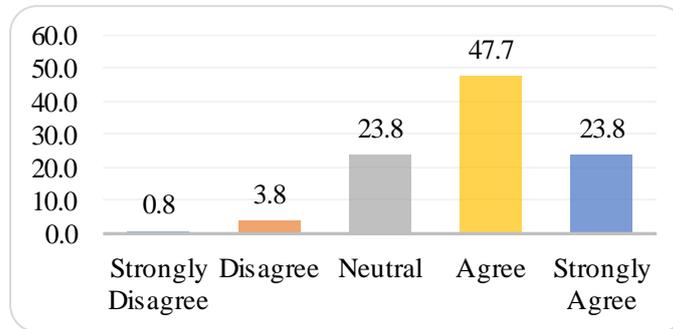


Figure-3: Relative Distribution for Strategic Learning

Generally, Table 8 presents that the value of the arithmetic mean of responses is 3.878 for all the items of strategic vigilance types, which does not differ from the expected mean of 4 at a significant level of 5% and a standard deviation of 0.708. The calculated T-test value reached $|-1.968|$ (less than the tabulated value of 1.984). The coefficient of variation is 18.25%, which has a small value, indicating that the responses around the types of strategic vigilance have consensus with an agreement of 81.75%, i.e., the sample has the awareness and agrees on the availability of the types of strategic vigilance within their companies. This finding was one of the main objectives of the current study, which aimed to explore the availability of the types of strategic vigilance and their level of implementation within the selected IOCs operating in Egypt.

Table-8: Descriptive Statistics of the Types of Strategic Vigilance

Item	Mean	Std. Dev.	t-test	CV
Environmental Vigilance	4.072	0.721	1.144	17.70
Technological Vigilance	3.962	0.759	-0.578	19.15
Commercial Vigilance	3.835	0.878	-2.138	22.89
Competitive Vigilance	3.642	0.814	-5.010	22.35
Strategic Vigilance	3.878	0.708	-1.968	18.25

Std. Dev.= Stranded Deviation; CV= Coefficient of Variation

Figure (4) shows the relative distribution of the sample responses around the types of strategic vigilance. The percentage of “agree” is 75.4%, 21.5% for “neutral”, and 3.1% for “disagree”.

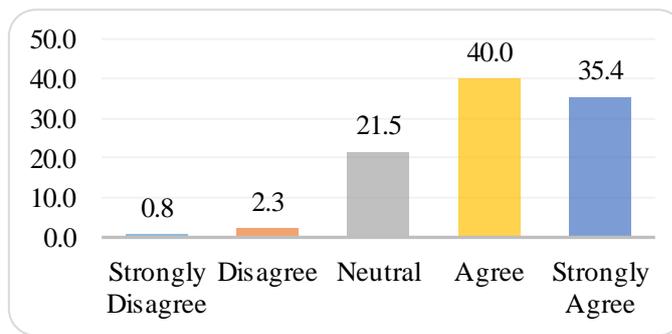


Figure-4: Relative Distribution for Strategic Vigilance

4.3 Pearson’s Correlation Analysis

Table 9 clearly reveals the significant positive relationship between the variables of strategic learning and the types of strategic vigilance, at a confidence level of 99%. This relationship ranged between 0.485-0.745. So, we could study the impact of strategic learning variables on the types of strategic vigilance.

Table-9: Pearson Correlation Matrix of Independent and Dependent Variables

Item	Strategic Knowledge Creation	Strategic Knowledge Distribution	Strategic Knowledge Interpretation	Strategic Knowledge Implementation
Environmental Vigilance	0.485**	0.577**	0.745**	0.595**
Technological Vigilance	0.524**	0.577**	0.627**	0.569**
Commercial Vigilance	0.552**	0.615**	0.686**	0.658**
Competitive Vigilance	0.560**	0.548**	0.631**	0.652**

*** Correlation is significant at 1% level*

4.4 Linear Regression Analysis

The first hypothesis states that there is a significant relationship between strategic learning and strategic vigilance. The other developed four sub-hypotheses state that there are significant relationships between the dimensions of strategic learning and each type of strategic vigilance.

Table 10 shows that F calculated at 76.819 is greater than the F tabulated at 3.782, thus, the regression model is statistically significant at a confidence level of 99%. (R) equals 0.804, and (R square) equals 0.647. This indicates that the independent variables in the model explain 64.7% of any change in strategic vigilance. Beta indicates that a one-point increase in strategic knowledge interpretation, creation, and distribution will increase strategic vigilance by 0.473, 0.260, and 0.209, respectively. Accordingly, we accept the main hypothesis.

Table-10: Coefficient of Determination-Goodness of Fit for Strategic Vigilance

Item	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	VIF
	B	Std. Error	Beta			
(Constant)	0.809	0.215		3.772	0.000	
Strategic Knowledge Interpretation	0.414	0.068	0.473	6.088	0.000	2.155
Strategic Knowledge Creation	0.228	0.055	0.260	4.164	0.000	1.388
Strategic Knowledge Distribution	0.175	0.062	0.209	2.818	0.006	1.953
R			0.804			
R Square			0.647			
Adjusted R Square			0.638			
F Test			76.819			

R= correlation; R square= Coefficient of Determination; VIF= Variance Inflation Factor

Table 11 shows that F calculated at 83.488 is greater than the F tabulated at 4.605, thus, the regression model is statistically significant at a confidence level of 99%. (R) equals 0.754, and (R square) equals 0.568. This indicates that the independent variables in the model explain 56.8% of any change in environmental vigilance. Beta indicates that a one-point increase in strategic knowledge interpretation and creation will increase environmental vigilance by 0.674 and 0.137, respectively. Accordingly, we accept the first sub-hypothesis.

Table-11: Coefficient of Determination-Goodness of Fit for Environmental Vigilance

Item	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	VIF
	B	Std. Error	Beta			
(Constant)	1.377	0.236		5.832	0.000	
Strategic Knowledge Interpretation	0.600	0.061	0.674	9.889	0.000	1.365
Strategic Knowledge Creation	0.122	0.061	0.137	2.005	0.047	1.365
R			0.754			
R Square			0.568			
Adjusted R Square			0.561			
F Test			83.488			

R= correlation; R square= Coefficient of Determination; VIF= Variance Inflation Factor

Table 12 shows that F calculated at 38.162 is greater than the F tabulated at 3.782, thus, the regression model is statistically significant at a confidence level of 99%. (R) equals 0.690, and (R square) equals 0.476. This indicates that the independent variables in the model explain 47.6% of any change in technological vigilance. Beta indicates that a one-point increase in strategic knowledge interpretation, creation, and distribution will increase technological vigilance by 0.336, 0.246, and 0.237, respectively. Accordingly, we accept the second sub-hypothesis.

Table-12: Coefficient of Determination - Goodness of Fit for Technological Vigilance

Item	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	VIF
	B	Std. Error	Beta			
(Constant)	1.106	0.280		3.948	0.000	
Strategic Knowledge Interpretation	0.315	0.089	0.336	3.547	0.001	2.155
Strategic Knowledge Creation	0.232	0.072	0.246	3.239	0.002	1.388
Strategic Knowledge Distribution	0.213	0.081	0.237	2.628	0.010	1.953
R				0.690		
R Square				0.476		
Adjusted R Square				0.464		
F Test				38.162		

Table 13 shows that F calculated at 40.755 is greater than the F tabulated at 3.319, thus, the regression model is statistically significant at a confidence level of 99%. (R) equals 0.752, and (R square) equals 0.566. This indicates that the independent variables explain 56.6% of any change in commercial vigilance. Beta indicates that a one-point increase in strategic knowledge interpretation, implementation, creation, and distribution, will increase commercial vigilance by 0.317, 0.195, 0.191, and 0.187, respectively. Accordingly, we accept the third sub-hypothesis.

Table-13: Coefficient of Determination - Goodness of Fit for Commercial Vigilance

Item	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	VIF
	B	Std. Error	Beta			
(Constant)	0.127	0.309		0.410	0.682	
Strategic Knowledge Interpretation	0.344	0.104	0.317	3.310	0.001	2.639
Strategic Knowledge Implementation	0.244	0.120	0.195	2.039	0.044	2.621
Strategic Knowledge Creation	0.208	0.081	0.191	2.582	0.011	1.579
Strategic Knowledge Distribution	0.194	0.088	0.187	2.194	0.030	2.089
R				0.752		
R Square				0.566		
Adjusted R Square				0.552		
F Test				40.755		

R= correlation; R square= Coefficient of Determination; VIF= Variance Inflation Factor

Table 14 shows that F calculated at 43.860 is greater than the F tabulated at 3.782, thus, the regression model is statistically significant at a confidence level of 99%. (R) equals 0.715, and (R square) equals 0.511. This indicates that the independent variables explain 51.1% of any change in competitive vigilance. Beta indicates that a one-point increase in strategic knowledge implementation, interpretation, and creation will increase competitive vigilance by 0.306, 0.291, and 0.228, respectively. Accordingly, we accept the fourth sub-hypothesis.

Table-14: Coefficient of Determination - Goodness of Fit for Competitive Vigilance

Item	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	VIF
	B	Std. Error	Beta			
(Constant)	0.307	0.301		1.018	0.311	
Strategic Knowledge Implementation	0.357	0.114	0.306	3.140	0.002	2.451
Strategic Knowledge Interpretation	0.292	0.092	0.291	3.162	0.002	2.174
Strategic Knowledge Creation	0.230	0.079	0.228	2.914	0.004	1.578
R			0.715			
R Square			0.511			
Adjusted R Square			0.499			
F Test			43.860			

R= correlation; R square= coefficient of determination; VIF= Variance Inflation Factor

4.5 Path Analysis Technique

For further investigation of the impact of the variables of strategic learning on the types of strategic vigilance via multiple causal pathways, the path analysis technique of the Amos V.24 statistical program was utilized. The designed conceptual model for the current study has been adjusted based on the statistical findings as shown in Figure 5 and Table 15:

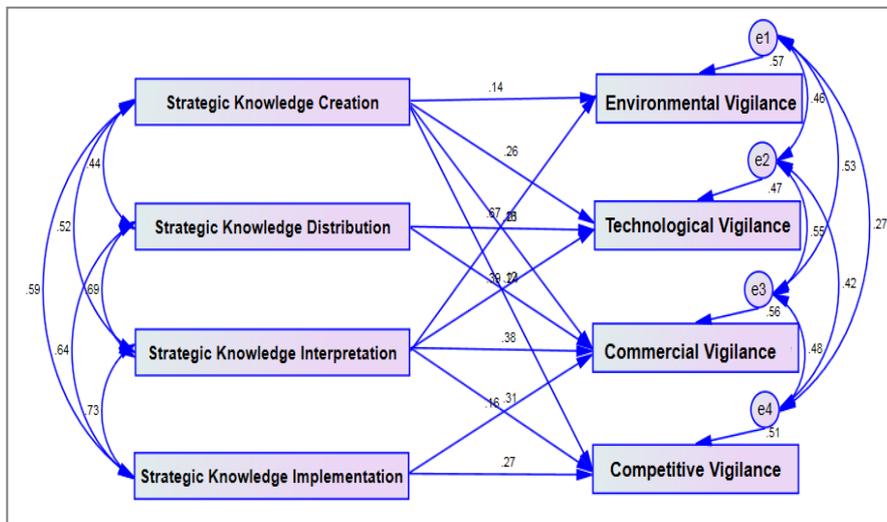


Figure-5: The Adjusted Conceptual Model

Table-15: Direct and Total Effect of Strategic Learning on Strategic Vigilance

Independent Variables	Dependent Variables	B	BETA	P-value	R ²
Strategic knowledge creation	Environmental vigilance	0.122	0.137	0.043	56.8%
Strategic knowledge interpretation		0.600	0.674	***	
Strategic knowledge creation	Technological vigilance	0.239	0.256	***	46.7%
Strategic knowledge distribution		0.145	0.163	0.031	
Strategic knowledge interpretation		0.360	0.386	***	
Strategic knowledge creation	Commercial vigilance	0.227	0.210	0.003	55.5%
Strategic knowledge distribution		0.119	0.115	0.078	
Strategic knowledge interpretation		0.413	0.384	***	
Strategic knowledge implementation		0.205	0.165	0.025	
Strategic knowledge creation	Competitive vigilance	0.242	0.240	0.002	50.6%
Strategic knowledge interpretation		0.314	0.313	***	
Strategic knowledge implementation		0.313	0.270	0.002	

C.R. = Critical Ratio

Source: By the researcher based on Amos V.24 results

5. Summary, Contributions, and Recommendations

Methods of thinking and management patterns of yesterday, previously set managerial decisions, and traditional strategic planning that is built on abundant and transparent information; are no longer up to the challenges of today or tomorrow within today’s turbulent business environment. Consequently, IOCs should realize that competitiveness is not a choice, but rather an inevitability dictated by new circumstances that must be addressed through strategic renewable tools such as strategic learning along with strategic vigilance and integrating them into their operations if they are willing to survive and develop their shares in the market.

5.1 Conceptual Contribution

This topic is a strategic theme of great interest for many writers, scholars, authors, and researchers due to its great influence on the future of business organizations. Hence, the application of strategic vigilance has become imperative within the framework imposed by contemporary environmental changes in business organizations. As such, the current study is an answer to the call for a more robust framework to investigate how the variables of strategic learning impact strategic vigilance in business organizations and sheds more light on other aspects of strategic vigilance in a different context.

A rising trend in the literature is supported by the current investigation. Since it includes the most recent writing in this area that is backed by empirical findings, it is seen as an expansion of current knowledge of existing literature on strategic learning and strategic vigilance. As such, it enriches the body of literature. Furthermore, the current study is among the few that establishes a connection between strategic alertness and strategic learning. As no theoretical or field study combined these significant constructs, according to the reached studies. The prior literature dealt separately with either the first topic or the second topic. In addition, the current study is a modest attempt to bridge the identifiable gap between academics and practitioners by shedding

more light on key academic terms and drawing the attention of officials working at the companies under study to the significant roles and impact of both strategic learning and strategic vigilance for their companies.

5.2 The Empirical Contributions

The statistical analysis and hypotheses testing revealed that all the developed hypotheses for the current study were accepted. That there is empirical evidence of the significant relationship between strategic learning and strategic vigilance as well as the significant relationship between the variables of strategic learning and the four types of strategic vigilance. Thereby, the primary objective of the current study has been achieved. Moreover, the availability of strategic learning and strategic vigilance within the IOCs under study with an agreement are 82.43% and 81.75% respectively. Therefore, another objective of the current study has been achieved.

Data analysis revealed a positive impact of strategic knowledge creation and strategic knowledge interpretation on the four types of strategic vigilance. Additionally, all strategic learning variables except for strategic knowledge implementation have a positive impact on technological vigilance. On the contrary, all strategic learning variables except for strategic knowledge distribution have a positive impact on competitive vigilance. Additionally, it was revealed that the IOCs under study seemed to be homogenous; there were no statistically significant differences among the sample's responses regarding the study constructs and the different items within the demographic profile.

5.3 Study Recommendations

IOCs officials can use the current findings to develop specific plans and strategies for strategic learning as well as strategic vigilance based on their company's objective, skills, and expertise to improve their company's performance level. Thus, building upon the empirical findings in addition to the interpretation of the responses received from face-to-face interviews, the study recommends the following:

- The concept of strategic vigilance needs to be endorsed within the company culture as vigilance is a collective action and is not limited to individual action that requires the integration of all employees' efforts according to each position within the organizational hierarchy.
- Companies should spread a culture of strategic vigilance among employees, as an innovative strategic tool to ensure survival, continuity, and competitiveness.
- IOCs officials need to pay more attention to competitive vigilance and commercial vigilance, as they appear to be the least applied types of strategic vigilance.
- Finally, IOCs should work on creating an effective, healthy social environment that contributes to good collaboration between members and addresses internal problems. As survey responses showed a wide range of opinions from participants, some of whom used the survey to raise issues and express recommendations they were unable to express clearly within their company contexts.

5.4 Limitations and Directions for Future Research

Every study will face some challenges. Any scientific study has some items that are not fully covered. The identified limitations of this study were the lack of a sampling frame due to data confidentiality regarding the international oil companies operating in Egypt that directly affected the data collection technique; in addition, providing the questionnaire to a sample of employees working in a certain sector makes the findings not generalizable to other different sectors. Thus, the current study horizons remain open for further contributions. Future studies are encouraged to be applied to different sectors within the MOPMR or different fields within the Egyptian context. Additionally, through the awareness gained in the pilot study and empirical findings, it is recommended that future studies consider moderating or mediating constructs that may provide a deeper understanding of the correlations between the main study constructs (e.g., supportive management and organizational culture).

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APPENDIX A

Table-16: Final List of Large-Scale Questionnaire

Construct	Operational Measure
Strategic Knowledge Creation	<ol style="list-style-type: none"> 1. The company’s aim is to acquire knowledge to develop projects that lead us into new areas (new markets - technological areas). 2. The company collect novel information and ideas that go beyond our current market and technological experiences. 3. The company aim is to collect new information that forces us to learn new things in developing our projects.
Strategic Knowledge Distribution	<ol style="list-style-type: none"> 1. Within our company, sharing strategic information is the norm. 2. Within our company, strategically important information is easily accessible to those who need it most. 3. Representatives from different departments within our company meet regularly to discuss new strategically important issues. 4. The strategic information is actively shared between different departments within our company. 5. When one department obtains strategically important information, it is circulated to other departments.
Strategic Knowledge Interpretation	<ol style="list-style-type: none"> 1. When faced with new strategically important information, our managers usually explain how the information will impact the company. 2. In meetings, the company seeks to understand everyone’s point of view concerning the new strategic information. 3. Groups are prepared to rethink decisions when presented with new strategic information. 4. When confronting new strategic information, we are not afraid to reflect critically on the shared assumptions we have about our company.
Strategic Knowledge Implementation	<ol style="list-style-type: none"> 1. Acquired strategic knowledge by working groups is used to improve the company projects. 2. The decisions we make according to new strategic knowledge are reflected in changes to our company systems and procedures. 3. The strategic knowledge gained by individuals is considered as a main source in developing the company strategy. 4. Recommendations by groups or individuals concerning the use and impact of strategic knowledge are adopted by the company.

Environmental Vigilance	<ol style="list-style-type: none"> 1. Monitoring the business environment is a priority for the company to be able to adapt to its changes to ensure the continuity and sustainability of its business operations. 2. The company works using the right methods of waste disposal and follow modern techniques in eliminating or reducing environmental pollution resulting from its work. 3. The company seeks to identify opportunities and threats in the external environment. 4. The company's management is fully aware of the various developments in the economic situation, including income levels, wages, consumption prices, inflation and exchange rates. 5. The company has a healthy social environment that contributes to good exchanges between its members and addresses internal problems.
Technological Vigilance	<ol style="list-style-type: none"> 1. Our company develops assessment profiles on emerging technologies to better understand their characteristics, potential applications and market advantages, that believe are most important for its operations. 2. The company has an effective communications and information technology infrastructure. 3. The company allocates sufficient budget to implement modern technology programs and equipment. 4. The company is keen to cooperate with the specialized companies in technological fields related to its operations. 5. The company is keen on the continuous follow-up of the new scientific discoveries in the oil industry.
Commercial Vigilance	<ol style="list-style-type: none"> 1. The company is concerned about the plans and intentions of its key competitors, alliances, suppliers, distributors and other stakeholders and work continuously to monitor its relations with them. 2. The company analyzes and evaluates its strengths and weaknesses from time to time. 3. The company works to attract the best workers in the labor market. 4. The company promotes its activities through social media and media networks. 5. The company's management benefits from participating in regional, international, multilateral conferences and seminars as alerts to notify decision makers of opportunities to seize and threats to overcome.
Competitive Vigilance	<ol style="list-style-type: none"> 1. Our company produces assessments that address several possible outcomes of our competitor's actions that might be threats or opportunities for our company. 2. The company monitors the facilitation of the flow of information between its departments to carry out its mandated tasks efficiently and effectively. 3. The company is always keen to collect information about its competitors to know their strengths and weaknesses. 4. Our company use basic competitor analytical models (e.g. SWOT and GAP analysis).