IMPACT OF TOP MANAGEMENT TEAM (TMTB) BEHAVIORAL ON FIRM INNOVATION THROUGH THE MEDIATING ROLE OF STRATEGIC AGILITY IN OIL FIRMS IN ERBIL-IRAQ

2024
PhD THESIS
BUSINESS

Shno Noori Ahmed DZAEE

Thesis Advisor
Prof. Dr. Fatma Zehra SAVİ

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Shno Noorahmed DZAEE

Thesis Advisor
Prof. Dr. Fatma Zehra SAVİ

T.C.
Karabuk University
Institute of Graduate Programs
Department of Business
Prepared as
PhD Thesis

KARABUK
January /2024

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THESIS APPROVAL PAGE

I certify that in my opinion the thesis submitted by Shno Noori Ahmed DZAEE titled IMPACT OF TOP MANAGEMENT TEAM BEHAVIORAL(TMTB) ON FIRM INNOVATION THROUGH THE MEDIATING ROLE OF STRATEGIC AGILITY IN OIL FIRMS IN ERBIL-IRAQ is fully adequate in scope and in quality as a thesis for the degree of PhD.

Prof. Dr. Fatma Zehra SAVİ .....

Thesis Advisor, Department of Business Administration

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Name Surname: Shno Noorahmed DZAEE

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FOREWORD

I dedicate my thesis work and give special expression to my advisor Prof. Fatma Zahra Tan for all her advice, motivation, and knowledge and encouragement during writing this thesis and all of the Ph.D. program, and I would like to express my gratitude to my family members who always encouraged and fully supported me the greatest leader my father, to my heart my mother to my sisters and my brother and many friends, finally thanks to everyone who helped me.

ABSTRACT

This study aimed at identify the impact of top management team behavioral (TMTB) investigate the level of behavioral engagement among the top management teams of oil firms in the areas of participatory behavior, information exchange, and participatory decision-making as independent variables on firm innovation as dependent variable through the mediating role of strategic agility by the dimension of strategic sensitivity, leadership unity, resource fluidity in oil firms in Erbil-Iraq, For achieving the objectives of this study, four main hypotheses were adopted with sub-hypotheses. The methodology chosen in undertaken study is the analytical quantitative method, to study about the top management team staff in oil firms in Erbil city as a study a sample, The questionnaire has adopted to collect data, 216 questionnaires were answered by respondents, statistical program was applied to analyzing data. In addition, some of analysis tests chooses such as: Cronbach's Alpha: Cronbach's Alpha, Exploratory Factor Analysis (EFA) Test, Confirmative factor analysis (CFA), standard deviation, Pearson correlation coefficient, test of paths and parameters, there was a strong correlation and statistical significance at 0.05 level of significant.

The findings show a significant positive association between top management team behavioral and firm innovation, which is mediated by strategic agility. A more agile approach should be developed by Erbil oil firms, and the behavior of the top management team should be emphasized. This would improve their capacity for innovation and their overall performance, according to the findings.

Keywords: Top Management Team Behavioral (TMTB), Firm Innovation; Strategic Agility, oil firms.

ÖZ

Bu çalışma, üst düzey yönetim ekibi davranışının (TMTB), petrol şirketlerinin üst yönetim ekipleri arasındaki katılımcı davranış, bilgi alışverişi ve katılımcı karar alma alanlarındaki bağımsız değişkenler olarak firma inovasyonu üzerindeki davranışsal katılım düzeyini araştırmak üzerindeki etkisini belirlemeyi amaçlamıştır. Erbil-Irak'taki petrol firmalarında stratejik duyarlılık, liderlik birliği ve kaynak akışkanlığı boyutları aracılığıyla stratejik çevikliğin aracılık rolü aracılığıyla bağımlı değişken olarak kullanılması, Bu çalışmanın amaçlarına ulaşmak için alt hipotezlerle birlikte dört ana hipotez benimsenmiştir. Yapılan çalışmada seçilen metodoloji, örnek olarak Erbil kentindeki petrol şirketlerindeki üst düzey yönetim kadrosu personeli hakkında araştırma yapmak için analitik niceliksel yöntemdir. Veri toplamak için anket benimsenmiştir, 216 anket katılımcılar tarafından yanıtlanmıştır, istatistik programı hazırlanmıştır. Verilerin analizinde uygulanır. Ayrıca bazı analiz testlerinde şunlar seçilir: Cronbach's Alpha: Cronbach's Alpha, Açımlayıcı Faktör Analizi (EFA) Testi, Doğrulayıcı Faktör Analizi (CFA), Standart Sapma, Pearson Korelasyon Katsayısı, Yollar ve Parametreler Testi, Güçlü Bir Korelasyon Vardı ve istatistiksel anlamlılık 0,05 düzeyinde anlamlıdır.

Bulgular, üst düzey yönetim ekibinin davranışı ile stratejik çevikliğin aracılık ettiği firma inovasyonu arasında önemli bir pozitif ilişki olduğunu göstermektedir. Erbil petrol firmaları tarafından daha çevik bir yaklaşım geliştirilmeli ve üst yönetim ekibinin davranışlarına ağırlık verilmeli. Bulgulara göre bu, inovasyon kapasitelerini ve genel performanslarını artıracak.

Anahtar Kelimeler: Üst Yönetim Ekibi Davranışı (TMTB), Firma İnovasyonu; Stratejik Çeviklik, petrol firmaları.

ARCHIVE RECORD INFORMATION

Title of the Thesis	Impact Of Top Management Team Behavioral (TMTB) on Firm Innovation Through the Mediating Role of Strategic Agility in Oil Firms in Erbil-Iraq
Author of the Thesis	Shno Noori Ahmed DZAEE
Advisor of the Thesis	Prof. Dr. Fatma Zehra SAVİ
Status of the Thesis	Ph.D.
Date of the Thesis	17/01/2024
Field of the Thesis	Business Administration
Place of the Thesis	UNIKA/IGP
Total Page Number	205
Keywords	Top Management Team Behavioral (TMTB), Firm Innovation; Strategic Agility, oil firms.

ARŞİV KAYIT BİLGİLERİ

Tezin Adı	Erbil-Irak'taki Petrol Firmalarında Stratejik Çevikliğin Aracı Rolü Yoluyla Üst Yönetim Ekibi (Tmt) Davranışının Firma İnovasyonu Üzerindeki Etkisi
Tezin Yazarı	Shno Noori Ahmed DZAEE
Tezin Danışmanı	Prof. Dr. Fatma Zehra SAVİ
Tezin Derecesi	Doktora
Tezin Tarihi	17/01/2024
Tezin Alanı	İşletme
Tezin Yeri	KBÜ LEE
Tezin Sayfa Sayısı	205
Anahtar Kelimeler	Üst Yönetim Takım Davranışı (TMTB), Firma İnovasyonu; Stratejik Çeviklik, petrol firmaları

SUBJECT OF THE RESEARCH

The impact of the top management team behavioral on firm innovation through mediating role of strategic agility in oil firms in Erbil-Iraq. A sample from the Kurdistan region- Erbil city in oil firms. This study was meant to analyze three variable the impact of top management team behavioral by its dimensions participative behavior, information exchange, participation in decision making on firm innovation by administrative innovation, technological innovation through mediating role of strategic agility by its dimensions strategic sensitivity, leadership unity, resource fluidity in the oil sector which is oil firms in Erbil city.

PURPOSE AND IMPORTANCE OF THE RESEARCH

With an emphasis on the mediating role of strategic agility, the study attempts to evaluate the impact of top management behavioral on firm innovation in oil firms. Given the difficult and continuously changing business climate in which oil companies operate, this subject is of utmost importance. Businesses in this sector must be flexible, proactive, and agile in reacting to shifting market conditions and client needs in order to stay competitive and profitable. The organizational culture and strategic direction of the company are greatly influenced by top management, which can have a big impact on innovation outcomes.

The points reflecting the significance of this study are as follows:

- One of the Kurdistan regions of Iraq's fastest-growing cities, Erbil, depends heavily on the oil industry for its economic and expansion, generating a sizeable portion of the city's gross domestic product (GDP), Therefore, this study intends to shed light on the current state of the oil industries and the enterprises' level of innovation.
- This study also tries to draw the attention of researchers to the importance of the impact of the behavior of the top management team on the innovation of oil companies through strategic agility, and the study has not previously linked these three variables before.

- Additionally, this study demonstrates the significance of firm innovation in the current context of those firms and its general direct influence on the ability of those firms to succeed in achieving their objectives in a successful and unique way.
- Given the fierce competition and dynamic nature of the industry, it is essential to comprehend the impact of top management behavior on business innovation through strategic agility. This study aims to contribute to a better understanding of the fundamental factors influencing innovation in the oil sector and offer managers insights to foster creativity in their individual organizations by analyzing the relationship between top management behaviors, strategic agility, and company innovation.
- creating a flexible organization that can react to shifting market conditions swiftly. Thus, understanding how businesses can attain strategic agility and remain competitive in today's changing business climate requires a thorough understanding of the behavioral patterns of top management in fostering innovation.

METHOD OF THE RESEARCH

In order to achieve the objectives of the research on the impact of top management behavioral on firm innovation through the mediating role of strategic agility in oil firms in Erbil. A thorough process was applied. The research design used was a descriptive- analytical approach, entailing the gathering and statistical analysis of numerical data. A survey is one of the methods the researchers use to collect quantitative data. In the questionnaire survey, the researcher used a five-point Likert scale. To gather information from the top management teams of chosen oil firms, a survey questionnaire was given to a sample of 20 oil firms in Erbil. The Statistical program was used to analyze the data gathered from the survey questionnaire.

The conceptual framework created for the study was then used to compare the data analysis results in order to identify the influence of top management behavior on firm innovation through the mediating strategic agility's function. The validity and

reliability of the research findings were improved by the employment of both quantitative data collection methods.

HYPOTHESIS OF THE RESEARCH / RESEARCH PROBLEM

The problem of the study is identified in the given answers to the following question: What is the effect of the top management team behavioral on the firm innovation through strategic agility at oil firms?

The study methods chapter will break this question into several relevant sub-questions. Hypotheses of the study in an attempt to answer the questions of the study provided, the following hypotheses are encountered:

The first main hypothesis (top management team behavioral – firm innovation):

H1: Top management team behavioral has positive effect on firm innovation.

There is a statistically significant effect of top management team behavioral on the firm innovation in the oil firms.

Sub hypothesis: There is a statistically significant effect of top management team behavioral dimension (participatory behavior, information exchange, and participation in decision making) on firm innovation in oil firms.

H2: Top Management Team Behavioral Has Positive Effect on Strategic Agility.

There is the statistical significance of top management team behavioral on strategic agility.

Sub hypothesis: There is a statistically significant effect of top management team behavioral (participatory behavior, information exchange, and participation in decision making) on strategic agility in oil firms.

H3: Strategic Agility Has Positive Effect on firm innovation.

There is a statistically significant impact of Strategic Agility on firm innovation.

Sub hypothesis: There is a statistically significant effect of Strategic Agility (strategic sensitivity, leadership unity, resource fluidity) on firm innovation in oil firms.

H4: Top Management Team Behavioral Has Positive Effect on Firm Innovation Through Mediating Role of Strategic Agility

There is statistically significant impact of top management team behavioral on firm innovation through strategic agility.

THE RESEARCH PROBLEM

Over the past ten years, the Kurdistan region's economic performance has drastically decreased. There are various causes for the drop. the most significant being that the area was exposed to changes in the world market because of its reliance on oil exports. they saw a major drop in revenue as a result of the 2014 collapse in oil prices. Additionally, the region's inadequate investment regulations and inability to draw outside capital have hampered economic expansion, since it can inform policy choices aimed at enhancing economic performance, understanding the underlying causes of economic decline is essential. A thorough examination of the variables behind the drop will shed light on the precise areas that need reform and investment, The oil field must be highlighted primarily for the advancement of the country's economy.

Any study's framework must start with creating a solid research question. A research topic serves as a map for the entire investigation process, giving the investigation focus and direction. In order to fill a gap in our knowledge or understanding, it is crucial to craft a research question that is clear-cut, precise, and meaningful. A well-formulated research issue ought to be amenable to empirical study. Depending on all of the above this study’s problem statement can be summarized in the form of the following questions:

- Can the top management team behavioral contribute to improving the firm innovation through strategic agility?
- What is the level of the top management team behavioral of the firms’ boards of directors in the study sample in the field of information exchange, cooperation, and participatory decision-making?
- Were the study sample firms able to achieve firm innovation? Which activities has attracted the attention of the boards of the top management team behavioral of companies more than others? Do these companies differ in their innovation?

- To what extent do the study sample firms possess the strategic agility that enables them to deal with Changes taking place in their external environment, whether by way of strategic sensitivity, leadership unity, and resource fluidity. Did these firms differ in their level of strategic agility?
- Can strategic agility mediate the relationship between the level of the top management team behavioral of Iraq's oil firms and the level of firm innovation to?

POPULATION AND SAMPLE

In this research, the study sample was chosen conscientiously, taking into account the demographic, social and cultural factors and other relevant characteristics of the study population during planning and conducting research to ensure the validity and generalizability of the results. The study sample of this research includes the members of top management team staff in oil companies in Erbil city in Kurdistan region of Iraq in order to find the impact of the behavioral of top management on the firm innovation through strategic agility. The population size is 400 individuals and the study sample 216 top management team members from 20 companies contains of (top managements, expertise, advisors, head of departments, chief executive) which suitable to answer the questioner survey.

SCOPE AND LIMITATIONS / DIFFICULTIES

The scope of this study is focused on the top management team behavioral that influences firm innovation through strategic agility in the oil firm in Erbil. in order to improve the oil sector This study aims to provide answers to issues about how the top management team's behavioral conduct and cognition affect the firm's success with innovation specifically through strategic agility However, conducting research in the oil sector in Erbil also comes with several limitations such as: restrictions on conducting research in oil companies in Erbil- Kurdistan Region.

- Researchers may face difficulties due to the unstable political and security environment in the region. This is why oil companies prioritize security measures, which often lead to restricted access and availability of information.
- Another limitation of this study is the limited sample size used in the analysis. Due to the limited availability of companies in one geographical area, and the top management team members who agreed to answered the survey questionnaire also foreign experts, and the timing of their presence in the companies.
- The limited availability of data and information is another restriction. Due to competition and security issues, the oil business frequently operates with a high level of secrecy.
- On the other hand, collecting data on human behavior in companies can be difficult for a number of reasons, including social desirability bias and people's reluctance to disclose their opinions and experiences.

1. GENERAL INTRODUCTION

1.1. Background of the Study

In the last several decades, the modern environment has undergone large and quick changes, which have had a big impact on the survival, success, and continuity of the organizations. At the local and international levels, the organizations' environments grew more complicated and dynamic, which presented significant obstacles to all industries in general and Iraqi oil businesses in particular. Due to this reality, the oil corporations are now working on change and transformation in order to keep up with the demands of the rapidly changing environment. They have also had to reevaluate their philosophy, strategy, educational policy, and research policy. Responding swiftly and adaptably to environmental changes is one of the keys to success in dynamic situations and the sustainability of that success for as long as possible. This compelled it to make the best use of its existing competencies while implementing and improving operations to deliver current products and services and develop them concurrently after attempting to take the lead in researching and appropriately utilizing them within the constraints of the relevant structure. The most crucial aspect of these directions is that it is a comprehensive strategy that oil companies can use to meet these challenges and keep their commitments in a strong way. This strategy combines innovative practices with strategic plans that move toward exploring and utilizing new opportunities under flexible structures derived from operational and human characteristics. The stronger an organization's efforts are toward acquiring and absorbing new external knowledge, transforming, and applying it with prior knowledge represented by its experience and skill acquired over time, and being a leader in its competitive environment, the closer it is to achieving organizational ingenuity within its business environment.

Erbil is one of the main cities within the region and has witnessed tremendous growth in the oil industry over the years. The city is home to various multinational corporations that have invested in oil fields,

The oil industry is a crucial component of Erbil's economy. The oil industry, which has enormous reserves, is vital to the city's development and expansion. The northern part of Iraq, where Erbil is situated, is well-known for having abundant oil

resources. Over the years, Erbil's oil industry has witnessed a number of changes, from cyclical changes in oil prices to political upheavals. Nevertheless, the industry has endured and continues to play a significant role in the economic growth of the area. multiple foreign oil corporations have shown interest in Erbil's oil industry, which has led to the establishment of multiple oil exploration and production enterprises. Numerous jobs have been made possible by these enterprises, which have also significantly increased both the city's and the country's earnings. One of the cities in the Kurdistan region of Iraq with the highest economic growth is Erbil, which heavily relies on the oil industry.

Since the 1920s, Erbil city has been a center for oil and gas discovery and production. The city's oil industry plays a key role in the economic growth and stability of the area. For the residents of Erbil and the surrounding areas, the oil industry has generated a large number of work possibilities, lowered poverty and raising living standards. Additionally, the government has been able to spend in infrastructure improvement, public health, education, and other services thanks to the profits provided by the oil industry (Mills, 2016).

The oil and gas reserves in Erbil are anticipated to grow in the future, further solidifying the city's status as a significant participant in the oil and gas sector. Therefore, it is clear that the oil industry is a crucial part of the economy of Erbil City and needs ongoing investment and expansion to guarantee the continuous economic prosperity of the region.

Innovation is regarded as a crucial engine of success and competitiveness for individuals, organizations, and nations in today's world of rapid change and competition. By identifying new and improved methods of doing things, it promotes sustainable development, economic growth, entrepreneurship, and advancement.

The executive team, usually referred to as the top management team, is crucial in determining the general course and effectiveness of businesses. However, the culture of the company and employee motivation can be significantly impacted by their behavioral habits. Setting strategic objectives, developing policies, and overseeing operations are the responsibilities of top management teams. They must set a good example and uphold high moral and ethical standards. Communication within the team and effective achievements are crucial for long-term development. Conflicts inside the

top management group, however, can impede decision-making and have detrimental effects on the entire firm. Understanding their behavioral patterns can therefore aid in reducing potential hazards and fostering a more positive workplace culture. Additionally, the leadership style and emotional intelligence of top managers can have a favorable impact on employee engagement, increasing job happiness and productivity.

In order to stay ahead of the competition, a company must be able to quickly and effectively adapt to changes in the business environment. This is referred to as strategic agility. A corporation must be proactive in spotting prospective opportunities and dangers, then react swiftly and correctly if it wants to achieve strategic agility. Furthermore, it has been discovered that improving organizational performance greatly depends on the role of strategic agility as a mediator. According to a study by (Saleh, 2022a) the relationship between environmental dynamism and innovation performance is mediated by strategic agility. According to this result, businesses with high levels of strategic agility are better able to negotiate challenging conditions, which fosters organizational innovation and eventually improves performance. In order to better organizational flexibility and adaptation, strategic agility has therefore become a crucial mediator shaping the relationship between external conditions and performance.

For instance, a business that can quickly change its business strategy in response to shifting consumer demands may be at a major competitive advantage. Markets can change quickly in the modern world as a result of disruptive innovations, customer preference shifts, and technology improvements. Businesses that lack strategic agility are likely to find it difficult to keep up with these developments and eventually lag behind their rivals. Therefore, in order to thrive in the fast-paced business climate, firms must put a strong emphasis on integrating strategic agility into their operations.

From this standpoint, the idea of the current research was crystallized to take it upon itself to raise important contemporary issues, and to answer the main question: What is the impact of the behavior of the top management team on firm innovation through the mediating role of strategic agility, after the results of many practical or applied studies of these variables in different environments are important to the success and distinction of many organizations and their significant role in influencing their innovation. In view of the need of our environment and our companies for such studies and research, this research came to take upon itself to test these variables in the oil

companies in Erbil, which are in dire need of such studies as they bear a great responsibility in advancing the economic reality in the country because the oil sector plays an important role in the economy, for the purpose of collecting efforts and focusing them on the most important aspects that serve innovation more and sustain competition and thus achieve excellence. Accordingly, the objectives of the research were determined to identify the levels of the dimensions of the research variables and the type of correlation and influence relationships between them. To achieve these goals, the researcher put a set of main and sub-hypotheses that together formed a hypothetical scheme for the research that included the three research variables, a formula on the basis of these hypotheses, and tested by adopting a number of statistical methods for analyzing the data collected from the research sample individuals.

1.2. The Research Problem

Over the past ten years, the Kurdistan region's economic performance has drastically decreased. There are various causes for the drop. the most significant being that the area was exposed to changes in the world market because of its reliance on oil exports. they saw a major drop in revenue as a result of the 2014 collapse in oil prices. Additionally, the region's inadequate investment regulations and inability to draw outside capital have hampered economic expansion, since it can inform policy choices aimed at enhancing economic performance, understanding the underlying causes of economic decline is essential. A thorough examination of the variables behind the drop will shed light on the precise areas that need reform and investment, The oil field must be highlighted primarily for the advancement of the country's economy.

The infrastructure of the oil industry in Iraq is expanding along with it, despite a number of problems and dangers. According to the authors, the issues are categorized as "inherited" and linked to "path dependence" and reflect factors such as dependence on global oil prices, issues with transregional contacts, and a lack of uniform regulations for the sustainable development of the oil and gas industry (AL-Saadi et al., 2022).

High performance solutions are needed in the oil and gas sector to boost output, decrease unwarranted risks, and cut costs. Consequently, it is a field that necessitates extremely complex knowledge solutions. In actuality, this demonstrates that academic expertise in this field is highly valued and utilized to address issues, it was emphasized

that the complexity of innovation projects for complex systems must be approached differently since it exists at the technical operational level of the organization (which is very flexible and adaptive), at the management level, and at the strategic level (Pires & Urbina, 2009).

The need for innovation in oil and gas industries has never been more critical given the climate of continuously low pricing, rising costs, and growing complexity. But is the "innovation imperative" that has been universally accepted as a fact or is it still up for debate in the oil and gas industry? Recent research looked at how people are currently thinking about innovation in a time of rising costs, compounding risks, growing environmental concerns, mounting activity, and declining profitability. The prevailing opinion? The industry is at a turning point where businesses must start systematically implementing their need for innovation rather than just acknowledging it. Otherwise, their long-term survival may be in danger (Calzada Olvera, 2022).

Recently, a significant decline in the level of the country's economy was observed, which affected all aspects, and that the oil sector is one of the most important factors affecting it. Accordingly, the researcher suggested focusing on this field in order to find appropriate solutions for it.

Depending on the above developed problems and challenges the firm innovation can be especially important in the oil sector in Iraq because it represents the country’s infrastructure. In recent years, a decline in the level of performance of oil companies has been observed which is not to the level of ambition, and this has affected all aspects. This means there is a need for search into the root causes of these problems, development of methods dealing with them, studying the situation, which requires finding solutions. Here the role of top management teams can be important in dealing with these endeavors according to the opinion of the researcher , Another factor that is essential for dealing with the issue is the role of Strategic Agility which has been developed as a new concept and one of the strategies for managing change and confronting risks in order to guide businesses toward developing an internal vision to acquire the competencies required for competition and an external vision to capitalize on change's prospects (Fakunmoju et al., 2020a). Any study's framework must start with creating a solid research question. A research topic serves as a map for the entire investigation process, giving the investigation focus and direction. In order to fill a gap in our knowledge or

understanding, it is crucial to craft a research question that is clear-cut, precise, and meaningful. A well-formulated research issue ought to be amenable to empirical study. Depending on all of the above this study's problem statement can be summarized in the form of the following questions:

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- To what extent do the study sample firms possess the strategic agility that enables them to deal with Changes taking place in their external environment, whether by way of strategic sensitivity, leadership unity, and resource fluidity. Did these firms differ in their level of strategic agility?
- Can strategic agility mediate the relationship between the level of the top management team behavioral of Iraq's oil firms and the level of firm innovation to?

1.3. The Objective of The Study

The main objective of the study is to explore the nature of the relationship between the top management team behavioral (TMTB) corporate councils, the study sample, on the innovation of companies through the role that strategic agility can play as a mediating variable in that relationship. From it emerge several sub-goals, namely:

- Examine and recognize the patterns of conduct displayed by top management team behavioral in the oil companies in Erbil, and recognize the ways in which these patterns of conduct match or deviate from the objectives of inspiring innovation within the companies.

- Examine the direct impact of behavioral of the top management team on the firm innovation within the firms in the oil industry of Erbil.to pinpoint particular TMT behaviors that have a satisfactory correlation with the results of innovation of the study sample through its dimensions.
- Investigate the role of strategic agility as a mediating in the relationship between behavioral and firm innovation. How TMTBs influence adaptation behavior and translate into tangible innovation outcomes.
- Verify the extent to which the companies under study possess the required level of strategic agility that enables it to deal with environmental changes.
- Testing the influence relationship between the dimensions of the top management team (TMTB) behavioral for the study of corporate boards of directors, the sample of the study
- Verify whether there is a discrepancy between the companies in question in the level of availability of variables study subject.
- Aims to address the issues in the oil sector within Erbil city and offers recommendations on how to overcome these obstacles
- Contribute empirical evidence and insights to the existing body of knowledge and enhance understanding of the interaction between TMT behavior, strategic agility, and firm innovation, especially within the unique sector of Erbil's oil firms.
- Providing a set of conclusions and recommendations in light of practical results that will facilitate long-term innovation strategies

1.4. The Importance of the Study

Previously there is no research provided for the Iraqi business environment to investigate the impact of top management team behavioral (TMTB) on firm innovation with mediating role of strategic agility in the petroleum sector. Therefore, there is a serious need for empirical studies, The current study helps to identify the most significant theoretical and intellectual advancements connected to the research variables as follow:

- It deals with the description and analysis of the relationship and influence between three of the most important scientifically influential variables that have not received sufficient attention in the oil field, namely, the top management team behavioral, firm innovation and strategic agility.
- The current research aims to clarify the role of the top management teams in the surveyed companies (general managers, consultants, and advisors) and the significance of their practices so that these companies can play effective roles, define themselves and their presence, keep up with the rapid changes locally and globally, and reach the same level as companies in developed nations.
- Offer empirical evidence on the specific impact of TMT behavior on firm innovation in the distinctive setting of Erbil's oil industry.
- Illuminate the mediating role of strategic agility, providing insights into the mechanisms through which TMT actions influence innovation outcomes.
- The oil industry works in several cultural and regulatory contexts throughout the world. Analyzing TMT behavior sheds light on how successfully the group handles and adjusts to these variations, which affects the business's success abroad.
- In order to support the variables and the knowledge of those interested in this specialty, the researcher attempted to demonstrate the significance of the variables that have been studied and to clarify the most significant cognitive debates that took place between researchers. This issue was presented in the theoretical aspect of the research.
- The research is anticipated to yield findings that aid in directing the management of the surveyed companies in determining the most efficient patterns and procedures for utilizing present opportunities and finding new opportunities in the surrounding environment.
- For a number of reasons, it is crucial to examine the oil sector in Erbil city:

First off, the Kurdistan Region of Iraq's economy relies heavily on the oil and gas sector. Second, the discovery and development of the region's oil deposits have drawn foreign investors, who have a direct bearing on the socioeconomic progress of

the area. Thorough analysis of the research issue might offer insightful conclusions and suggestions to guarantee the industry's sustainable and responsible expansion.

1.5. Descriptive Study Plan

In light of the study problem and its objectives, and within its theoretical and applied framework, a hypothesis was prepared describing the logical relationships between the study variables, represents a set of relationships that link the study variables, which were built on the basis of the possibility of measuring each of its variables.

- The independent variable includes the entire top management team behavioral (TMTB) of firms with its three dimensions: Participatory behavior, information exchange, and participation in decision-making.
- The dependent variable is represented by the firm innovation with its tow dimensions administrative innovation, technology innovation.
- The mediating variable is strategic agility with its three dimensions strategic sensitivity, leadership unity and resource fluidity.

1.6. The Design Methods and Procedures

1.6.1. Research Methodology

The research approach is the way that the researcher takes and entails a number of actions taken to uncover the truth and respond to the questions that the researcher poses in the study in order to accomplish the objectives of scientific research. Information that accurately and fully represents reality and aids in the study of its phenomena , As the descriptive approach is based on defining the characteristics of the phenomenon, describing its nature quantitatively, and assessing the quality of the relationship between its variables, causes, trends, and other aspects that revolve around diagnosing a particular problem or phenomenon, it is a broad and flexible umbrella for numerous sub-methods and methods, such as social surveys, case studies, evolutionary and field studies (shalaka,2022).

Based on the nature of the research and objectives, the research design will be descriptive analytical. The first phase will be descriptive. This design will review

secondary sources such as books, articles, studies, research, and any material related to the topic of study. The second stage will use analytical in which the researcher will collect data through survey questionnaire.

1.6.2. Study Sample

The sample for this study is composed of 20 companies in Erbil. The target sample of firms working in the field of petroleum in the Erbil domain of Iraq. The respondents of the survey questionnaire will be top management teams (TMT) within their firms. In order to achieve the objective of studying the relationship between top management team (TMT) behavioral and firm innovation with mediating role of strategic agility, the data will collect from the petroleum company's top management teams which includes (Assistant Director, general director, consultant, advisor).

The searcher chooses 20 companies as a sample and should be noted that there is proximity 400 as a population that suitable for answer the questions according to the study sample which was chosen by researcher population. To do this study 216 filled the questionnaire as a sample respondent.

1.6.3. Data Collection

As mentioned above, the data collection instrument was a questionnaire, with a review that focused on theoretical framework of the study. The questionnaire was used to collect quantitative data, which was examined to detect the effect of top management team (TMTB) behavior on the firm innovation. The survey questionnaire consisted of four parts. In Part one, personal information is requested from the respondents to get demographic profile of our survey. Part two provides information about top management team (TMTB) behavioral as independent variable. Part three touches upon strategic agility as mediating variable. Part four focusses on firm innovation as dependent variable.

The independent variable includes the top management team (TMTB) behavioral of firm boards with three dimensions: Participatory behavior (3 questions), information exchange (3 questions), and participation in decision-making. (3 questions). Second part, mediating variable the strategic agility as mediating variable strategic sensitivity (3

questions), (leadership unity) (3 questions), resource fluidity (3 questions). Third part which is the firm innovation as dependent variable administrative innovation (3 questions) and technological innovation (3questions). To arrange the questionnaire, researcher used Likert scale of five points as following: 1. Strongly Disagree, 2. Disagree, 3. Neither Agree nor Disagree, 4. Agree, and 5. Strongly Agree.

1.6.4. Data Analysis

After data collection, the researcher started analyzing the collected data. This step of data analysis was done through statistical program the selection of appropriate statistical tools for data analysis and processing and hypothesis testing was considered as the primary method to establish the truth of hypotheses through the results of statistical analysis and processing tools. It included various analytical methods, as well as the following:

First: The Tools of Reliability and Constancy Are as Follows:

- Cronbach's Alpha to measure the internal consistency
- Confirmative factor analysis (CFA): to confirm the structural validity of the scales and ensure their suitability for their theoretical premises.
- Exploratory Factor Analysis (EFA) Test: to determine relationships (between observed variables and factors).
- Bartlett's test, also known as Bartlett's test of homogeneity of variances, is a statistical test used to assess whether the variances of multiple groups or samples are equal.
- The Kaiser-Mayer-Olkin (KMO) measure is a statistical test used in factor analysis to assess the adequacy of the sample for performing the analysis.
- Stability coefficient: to verify the stability of the scales and their accuracy in measuring variables in the field without complication or interference.
- Internal consistency coefficient: to verify the extent of harmony and consistency between the paragraphs and the dimensions they represent.

Second: Descriptive statistical tools, as follows:

- Percentages: for the purpose of determining the percentage of agreement answers on the main and sub-research variables, which represent the result of dividing the partial value by the total value multiplied by 100.
- Arithmetic Mean: to determine the level of response to the paragraphs and to know the level of the variables in the field.
- Standard Deviation: To find out the level of dispersion of the sample's answers from the arithmetic mean.
- coefficient of difference: It is one of the measures of dispersion, as it is used to compare the degrees of dispersion of two or more groups of values from their arithmetic mean, and in the form of a percentage that facilitates the possibility of comparison because it is not defined by certain units of measurement and is extracted by calculating the percentage of the product of dividing the standard deviation by the arithmetic mean.

Third: Analytical statistical tools including the following:

- Pearson correlation coefficient: It is used to determine the strength and type of relationship between two variables. It is a direct positive, an inverse negative, or zero, and its value ranges between (1+) and is expressed mathematically according to the law.
- Path Analysis: It is used to determine the level of indirect influence relationships between research variables
- Mediation analysis is a statistical technique used to determine whether a third variable mediates the link between two variables. The authors of the study employed mediation analysis to determine whether the association between top management team conduct and business innovation is mediated by strategic agility.

1.7. Research Limitation

Conducting research in the oil sector in Erbil also comes with several limitations such as: restrictions on conducting research in oil companies in Erbil- Kurdistan Region.

- Researchers may face difficulties due to the unstable political and security environment. This is why oil companies prioritize security measures, which often lead to restricted access and availability of information.
- Another limitation of this study is the limited sample size used in the analysis. Due to the limited availability of companies in one geographical area, and the top management team members who agreed to answered the survey questionnaire also foreign experts, and the timing of their presence in the companies.
- The limited availability of data and information is another restriction. Due to competition and security issues, the oil business frequently operates with a high level of secrecy.
- the other hand, collecting data on human behavior in companies can be difficult for a number of reasons, including social desirability bias and people's reluctance to disclose their opinions and experiences.

1.8. Related Studies

The previous study represents a central point in administrative research. Rather, it is the main base for building a solid research effort. This is beyond doubt that cognitive studies are not built out of a vacuum, a cumulative cognitive process that stems from the efforts of previous researchers and aims to achieve progress and contribute to the accomplished human knowledge. This topic was devoted to the most important knowledge efforts and developments about the variables of the current research, which were presented, in order to shed light on the most important fundamental facts. Oldest to newest according to search variables.

1.8.1. First: Previous Studies About Top Management Team Behavioral

The top management team (TMT) is incredibly important in determining how a firm behaves and performs as a whole. The organizational culture, behavioral dynamics, and overall effectiveness can all be profoundly impacted by the TMT. Here are some crucial roles played by the top management team across all industries.

Studies related to the independent variable, behavioral of the top management team Some previous studies related to the behavioral of the Top Management Team:

Study 1: Carmeli in 2008 in this research show the importance of (Top management team Behavioral Integration and the Performance of service organizations) with study variables Behavioral integration and Organizational performance referred to the diagnosis of the nature of the relationship between the activities within the top management team (exchange of information, cooperation, participation in decision-making) in the organizational performance in the services sector. Survey and community study the sample of the study consisted of 30 executives and (10) graduate students in (96) service organizations in occupied Palestine, and the study concluded that the behavior of the behaviorally integrated senior management team is positively related to the performance of human resources and economic performance. Applied to a group of government colleges, in addition to the current study dealing with three variables, unlike this study, which dealt with only two variables. community size varies. The similarities with the current study are similar to this study by addressing the variable of behavioral integration and the importance of the impact of this variable on the current study by the companies surveyed, and the questionnaire was used in both studies. (Carmeli, 2008)

Study 2: Top management team and firm innovation: research about (The relationship between top management teams and innovative capacity in companies) by (Díaz-Fernández et al., 2020) explain about Upper Echelon Theory is used to construct the study, which has two main goals: to examine the effects of particular top management teams' (TMTs') traits on innovative performance in their organizations and to ascertain whether these effects are direct or indirect, such as whether the team has reached a strategic consensus. A sample of 100 companies from cutting-edge industries was employed in this study. Various regression analyses were used to examine the proposed hypotheses. Three main conclusions may be derived from this study. To start, it is incorrect that all types of diversity in the TMT industry positively influence corporate creativity. This appears to be a negative effect of diversity in TMT tenure. Second, diversity and innovation may not always be directly correlated. Functional diversity therefore positively affects creativity, but only when the management team has come to a shared strategic vision. Regardless of any practices that may exist inside the team, the TMT educational level has a beneficial impact on how innovative an organization is. The goal of the paper was to improve and clarify the contributions made

to the Upper Echelon Theory direct relationship model between innovation and TMT demographics. The findings corroborate the contention of the theory's detractors that it is important to include and examine additional factors and processes that influence TMT decision-making in addition to demographic data.

Study 3: The impact of top management teams on firm innovativeness: a configurational analysis of demographic characteristics, leadership style and team power distribution

The top management team (TMT) demographic characteristics and features of leadership style are both examined in this study's novel configurational analysis. Qualitative interviews with 44 TMT members from 24 multinational European corporations were also undertaken. utilizing a fuzzy set Comparative Analysis of the Qualitative, Different causal hypotheses that more effectively account for corporate innovation have been found. This study shows that a company's innovativeness reflects how well its top management team fits with its tasks. As a result, it is possible to achieve the same level of innovative performance by using alternative strategic approaches. Businesses wanting to enhance the influence of senior management teams on their organization's innovativeness should pay particular attention to this study (Sperber & Linder, 2018).

Study 4: The effect of environmental regulations, top management commitment, and organizational learning on green product innovation: Evidence from automobile industry

in this study, a model to study the relationship between organizational learning, top management commitment, and green product innovation (GPI) is proposed and empirically tested, the Indian automotive manufacturing firms, The results show how crucial organizational learning and TMCO are for adopting GPI (in response to rules) and achieving targeted performance. Additionally, organizational learning serves as a complete mediator between top management commitment and GPI, and choose the Indian automotive manufacturing firms as a sample in order to implement GPI (in response to laws) and achieve desired performance, the findings highlight the significance of TMCO and organizational learning. Additionally, top management commitment and GPI are fully mediated by organizational learning. (Bhatia & Jakhar, 2021).

Study 5: Impact of top management team diversity on firm innovation doctor of philosophy July 2019

This study aims to determine whether TMT-level diversity fosters corporate creativity. Using a sample of S&P 500 companies from 2010 to 2017, this research question is put to the test. Patent applications and citations are indicators of innovation. The empirical findings demonstrate that characteristics of diversity including tenure, culture, education, and political affiliation have a favorable impact on innovation. The differences in gender, age, and jobs were not found to be significant (Bonyuet, 2019a).

Study 6: (Al Shaar et al., 2015) The Effect of Top Management Support on Innovation: The Mediating Role of Synergy Between Organizational Structure and Information Technology

The study sought to determine how organizational structure and information technology interacted to create a direct and indirect impact of top management support on innovation. Information was gathered from 210 industrial businesses. SEM, or structural equation modeling, was utilized to assess the study's hypotheses. Confirmatory Factor Analysis (CFA) was additionally performed to evaluate the accuracy and dependability of the study instrument. The study came to the conclusion that both product and process innovation are influenced by top management. The findings also indicated that senior management support has an impact on how organizational structure and information technology interact. Additionally, it was shown that the interaction between information technology and organizational structure has an impact on innovation (both in terms of new products and processes). The study also found that top management support for innovation (product innovation and process innovation) is not mediated by the interaction between organizational structure and information technology (Afshar Jahanshahi & Brem, 2017a).

Study 7: Study by (Moghtader Mansori et al., 2021) (Identifying the Psychological Traits of Top Managers in the Oil Industry)

Identifying the psychological traits of senior executives at the National Oil Distribution Company of West Azerbaijan (IRAN) was the goal of this study, In this study, senior managers were interviewed in-depth and semi-structured using the postmodern paradigm, phenomenological method, and hidden content analysis technique (up to theoretical saturation). The purposive (judgmental) sampling method

was used, there were 16 senior managers, and 10 interviewees provided information on theoretical saturation. Using MAX QDA12 software, interviews were analyzed using open coding and axial coding. The five psychological traits of benevolence, ambition, foresight, compatibility with others, and internal domination were found to be the traits of top managers in the research population. By recognizing and exploiting their psychological traits, improving their sense of purpose, increasing staff motivation and commitment, improving productivity and success, and improving employee performance and success, managers may totally rely on themselves. Ensure the organization's survival.

Study 8: The Top Management Team, Reflexivity, Knowledge Sharing and New Product Performance: A Study of the Irish Software Industry

Incorporating research on top management team (TMT) composition, trustworthiness, information sharing, and task reflexivity in companies, the study created a model to predict new product performance. The study tests the model using data collected from 39 indigenous software firms in Ireland, the findings show that age diversity was favorably correlated with the capacity for knowledge sharing, however educational attainment, tenure, and functional variety of the TMT did not directly influence reflexivity, capacity for information sharing, or motivation. However, through the intermediary variable of TMT trustworthiness, TMT tenure, age diversity, and reflexivity had indirect effects on knowledge sharing and sharing. (MacCurtain et al., 2010).

1.8.2. Second Part: Previous Study About Strategic Agility

Various contexts, such as the effect of organizational culture, innovation, decision-making procedures, or resource allocation on organizational performance, can be used to evaluate the role of strategic agility. Researchers can better understand the underlying mechanisms and routes by which these characteristics impact organizational outcomes by examining how strategic agility affects these interactions.

Study 1: Audran. (2011) wrote the paper about Strategic agility a winning phenotype in tur

This paper focuses on the concept of modernity, and more common in business literature: the concept of agility. In reviewing the corresponding literature, paints a picture of the "agile company" and emphasizes its main distinguishing features. He suggested that this observable approach could have a significant impact on decoding and predicting corporate success in dynamic environments. So you test this assertion by analyzing the success stories of Nespresso and Netflix in light of the graceful image gleaned from the literature. Besides, he confronts the observational approach to the concept of agility with the rest of the modern strategic management literature and developed an original framework for classifying and articulating the different intellectual currents that have emerged in the last twenty years. Finally, this research developed the foundations for a new concept intended to inspire future research.

Study 2: The influence of strategic agility on firm innovation behavior: a quantitative-empirical analysis (Clauß & Laudien, 2017)

The research explained the concept of strategic agility and how it affects the innovation of companies in Germany, and the research relied on the following questions How should businesses structure their innovation behavior in relation to their strategic agility? So, we inquire: How do exploration and ambidexterity affect the competitive advantage of the firm? and how does strategic agility impact the firm's competitive advantage as it relates to the fundamental innovation strategy of the firm? a sampling of 99 electronic industry-related German companies. Data was gathered via a questionnaire created from literature that we recently emailed to participants. Findings demonstrate that while exploration activities have no beneficial impact on competitiveness, they boost the firm's competitive edge. Ambidexterity has a detrimental impact on a company's competitive edge. We can better understand the relationship between firm innovation approaches, strategic agility, and firm competitive advantage by examining how, interestingly, strategic agility enhances the positive effect of exploration on the firm competitive advantage. This highlights the importance of strategic agility for firms that must deal with ecosystem complexity and change. We provide intriguing insights into the success component of the firm innovation behavior in turbulent times and advance both the strategy and innovation literatures by providing empirical evidence for the effects different forms of innovation have on firm competitiveness and how strategic agility influences these effects.

Study 3: Strategic agility in innovation: unpacking the interaction between entrepreneurial orientation and absorptive capacity by using practice theory

By examining the organizational micro practices of six highly profitable companies, this study aims to dissect the interaction effect between entrepreneurial orientation (EO) and absorptive capacity (ACAP) in order to identify three practices and nine micro practices that fuel the favorable profit outcomes from EO and ACAP. The interaction between EO and ACAP was found to be related with high profitability in this study, which used K-means cluster analysis to find 6 examples. In order to examine the relationship between EO and ACAP at the microlevel, the 6 instances were chosen. The researcher employed practice theory as the theoretical mythological perspective for this task and 31 interviews. The study makes a contribution by defining three practices - market-driven product commercialization, value-driven product creation, and proactive idea generation - as well as nine micro practices. What we refer to as strategic agility in innovation is shaped by these activities. (Kohtamäki et al., 2020).

Study 4: The exploration of the mediating role of strategic agility on the impact of strategic thinking on performance: a systematic organizational literature review

Using a comprehensive literature review methodology, the study sought to investigate the mediating function of strategic agility on the effect of strategic thinking on organizational performance, according to the study procedure, the following keywords were used in the search process across five search engines: Emerald Insight, EBECO, Pro Quest, Scopus, and Google Scholar: strategic thinking, strategic agility, and organizational performance , the sample was about 130 articles related to the scope of the study, Systems thinking, transformational leadership, transactional leadership, opportunism, and creative thinking were the most frequently used dimensions of strategic thinking, and flexibility, strategic sensitivity, resource fluidity, collective commitment, and technological capabilities were the most frequently studied dimensions of strategic agility. Financial performance, market share, growth, and stakeholder satisfaction were the elements of organizational performance that were most commonly studied, the most significant finding of this study is that there is a relationship between strategic thinking and organizational performance, as well as between strategic thinking and strategic agility and organizational performance (Saleh, 2022).

Study5: The importance of strategic agility to business survival during corona crisis and beyond Elali in 2021 published article aims to present the idea of strategic agility, highlight its key traits, and highlight how crucial it is for different businesses to adopt in order to attain excellence and sustainability. In a situation where there is intense competition and there are frequent shocks, like there is now with COVID-19, In order to take advantage of both the shift in consumer mood and behavior and the breakdown in supply chains, strategic agility offers a feasible way to leverage non-linear scientific and technical developments. The paper also underlines the relationship between strategic agility and company performance and stresses the importance of building agile companies that can survive in a turbulent and unreliable environment.

Study 6: Strategic agility and competitive advantage of oil and gas marketing companies: the moderating effect of information technology capability and strategic foresight

This study looked at the relationship between strategic agility and competitive advantage in the oil and gas marketing enterprises in Lagos State, Nigeria, and the combined moderating effects of information technology competency and strategic foresight. The investigation used a survey methodology, 515 managers from significant oil and gas marketing organizations made up the study's sample. A structured questionnaire was modified and validated while total enumeration was employed. According to the study's findings, the relationship between strategic agility and competitive advantage in the oil and gas marketing organizations is moderately influenced by information technology capacity and strategic foresight. In order to maximize the value of their business operations, oil and gas marketing companies in Nigeria are advised to make better use of information technology. They should also improve their ability to analyze the causes, motives, and consequences of potential future opportunities and the potential alternative strategic decisions that could be made in order to best take advantage of them. The study's limitations and additional areas for further research were identified (Fakunmoju et al., 2020a).

1.8.3. Third Part: The Previous Study About Firm Innovation

Innovation is a major factor in economic expansion, productivity, and sector-specific competitiveness. It encourages innovation, propels technical development, and

makes it possible for businesses to adjust to shifting market circumstances. For businesses to be competitive, capture new opportunities, and tackle societal concerns in a world that is changing quickly, they must embrace innovation, some of the relate studies explain about firm innovation in different sectors as a follow:

Study1. Service innovation and customer satisfaction: the role of customer value creation. (Mahmoud et al., 2018) It sought to study the links between quality-of-service innovation, customer value creation (CVC) and customer satisfaction (CS), with particular application to telecom providers in Ghana. 510 registered Ghanaian telecom network users were gathered for the study. The study revealed that the company's capacity to accomplish client services depended on how the telecoms operators harness and spread innovation efforts in the sphere of service. It demonstrated that the relationship between service innovation and customer satisfaction is mediated by the creation of customer value. Thus, there should be an interest in innovation in service to achieve customer value in order to improve customer satisfaction. By linking research findings to innovation strategies, managers can improve the strength of their service offerings to achieve customer satisfaction through more customer and market research.

Study 2: A descriptive model of the intra-firm innovation process

In order to understand the reality of organizational change and its relationship to innovation in small and medium-sized businesses—the latter of which have the capacity to innovate new ideas but are unable to put them into practice because of funding and management issues—as well as the accessibility of organizational change and innovation factors in these businesses. results in the growth of these kinds of institutions.

Study 3: Effects of innovation types on firm performance wrote by (Gunday et al., 2011).In this research the writer based on an empirical study involving 184 manufacturing companies in Turkey, the goal of this paper is to investigate the effects of organizational, process, product, and marketing innovations on various aspects of firm performance, including innovative, production, market, and financial performances. Through an integrated innovation-performance study, a theoretical framework is empirically validated to find the links between innovations and company performance. The findings demonstrate the beneficial effects of innovations on business performance in the manufacturing sectors.

Study 4: (Rashid & fair,2020) Knowledge management and its role in achieving innovation in business organizations

This study tries to show how knowledge management may help business organizations innovate in order to attain top performance that sets them apart from competitors. To accomplish this, the study was subjected to three axes, the first of which focused on understanding the theoretical foundations of knowledge management, the second of which dealt with the theoretical setting of the innovation process, and the third of which examined the connection between knowledge management and the innovation process within the organization. The study comes to the conclusion that knowledge plays a significant role and is clearly important for the effectiveness and efficiency of business organizations' activities. It also produced results, the most significant of which is that knowledge management and innovation are closely related, and that knowledge management helps an organization achieve innovation through its impact on various dimensions, including people, processes, and products.

Study 5 Liu et al. (2015)Innovation performance in new product development teams in china’s technology ventures: the role of behavioral integration dimensions and collective efficacy

Dimensions of the study: creative performance, behavioral integration of the top management team, collective effectiveness, the goal of the study is to better understand the connections between creative performance and the behavioral integration characteristics of cooperation, information sharing, and shared decision-making. It also looks at how team relationships are altered by collective effectiveness. The study method is analytical and the type of study is research paper and this study used two types of questionnaires to collect data on various variables from different respondents (a team member questionnaire and one copy of a team leader questionnaire). The study population and sample consisted of 479 individuals belonging to 96 teams in 33 technological projects in China (optical instruments, pharmaceuticals, computer and communications). And the differences from the current study is that it was applied in small and medium private companies, the difference in sample size similarities with the current study. The study found a positive correlation between information exchange and creative performance, while cooperative decision-making is unrelated to creative performance, collaborative behavior favorably but only slightly influences it.

Additionally, group effectiveness demonstrates a significant moderating function. In particular, when group effectiveness is stronger, both cooperative conduct and joint decision-making are more positively connected with creative performance.

1.8.4. Discuss Previous Studies

- The diversity of the target sector in earlier studies, which included both the public and private sectors, shows the value of study variables and how they may be used in many different contexts. As it turned out, the researcher decided to measure and test the three variables in the oil industry as a result of the lack of application of these variables at the level of private enterprises.
- Sector-specific Innovation and Strategy: The study clarifies the part played by TMTs in promoting innovation and creating successful strategies across various industries. It provides insights into how TMT behavior and decision-making affect an organization's capacity for innovation, industry disruption adaptation, and market opportunity exploitation.
- In contrast to the fact that there is no consensus regarding the dimensions of corporate innovation, there is clear agreement in defining the sub-dimensions of the variables (the top management team's behavior and strategic agility) in accordance with sound scientific models that have been approved in numerous studies pertaining to each of the aforementioned variables.
- The questionnaire was a primary data collection method in the majority of earlier studies, which suggests that it is a reliable tool for research and scientific studies on a global scale. This justifies the researcher's decision to use the questionnaire to gather data for his research.
- Numerous earlier studies used the analytical approach in its applied aspect, which provides justification for using this approach in the current investigation.
- The goals of the earlier investigations, the relationships between their variables, and the variations in their findings all clearly differ from one another. While the majority of them agreed on the theoretical underpinnings of their frameworks and intellectual indicators about the contents of the variables, this can be

attributed to the different approaches used in drawing the relationship between them and other variables as well as the difference in the nature of the chosen study environment. The study and its dimensions demonstrate how widely these variables, and their ideas are applied at the organizational level.

1.8.5. Benefit From Previous Studies

The following areas of benefit from earlier scientific endeavors to studies that addressed the factors of current study are represented by contributed studies:

- The previous study on TMTs in various industries has advantages by improving our comprehension of industry-specific problems, offering best practices and lessons learned, facilitating performance benchmarking and improvement, guiding talent management and succession planning, facilitating innovation and strategy development, promoting collaboration and partnerships, addressing risk management and crisis response, and encouraging cross-sector learning.
- Previous studies contributed to defining the variables of the current research, how to build the correlation between the variables, and defining the role and relationship of each variable with other variables.
- enlightening the researcher's horizons with some studies, research, periodicals, and websites that the researcher did not have the opportunity to view and know, which are crucial as a sound scientific method in writing scientific research, as well as reviewing the various points of view and models of their studies and coming up with an intellectual outcome that strengthens the relationship between the research variables and their proper compatibility in accordance with the research variables.
- facilitating the selection of the secondary dimensions of the primary variables used in the current research in accordance with a sound scientific framework represented by the adoption of discrete models and discrete measures, with the questionnaire form serving as a standard adopted by the majority of studies to measure the variables used.

- Previous research provided an understanding of the appropriate community for applying the research in a consensus-based manner to the research variables, which led to the selection of oil companies and the intentional choice of community members to represent the senior management team in the research sample companies.
- According to the hypothetical plan, previous research gave a strong scientific foundation for acceptable statistical procedures for data analysis and processing in accordance with the study's hypotheses.

1.8.6. Distinguishes the Current Research from Previous Studies

The current research is distinguished from the previous knowledge contributions as follows:

- According to the researcher's knowledge, no study had previously combined these three variables into one model in terms of the nature of the relationships between these variables and the results that have been reached. This provided a reason to satisfy the researcher's desire to delve deeply into the study's variables in order to further developments in administrative thought. In addition to its relevance to science.
- In the previous studies there is no research about three variables in one model taking top management team behavioral as independent variable and strategic agility as mediating variable and firm innovation as dependent variable applied in oil sectors in Erbil – Kurdistan region -Iraq.
- An analytical assessment of the Iraqi environment was required, with a focus on the oil sector, one of the key pillars upon which the nation's infrastructure was built.
- The majority of earlier studies lacked the current research's comprehensive intellectual and theoretical underpinning for its three variables.

2. LITERATURE REVIEWS

2.1. Introduction

This chapter will review the importance of Top management team (TMT) behavioral through the concept and define with it is dimensions Participatory behavior, information exchange, and participation in decision-making also firm innovation with it is dimensions competitive advantage, administrative innovation , technology innovation as depending variable and strategic agility with three dimensions strategic sensitivity, collective commitment (leadership unity) and resource fluidity, also discuss the importance role of the three variables in previous studies and in different sectors.

2.2. Top Management Team (TMT)

2.2.1. The Concept of Team

The idea of teams has been a major topic of discussion in prior literature review studies when it comes to businesses and other organizational contexts. Teams, which enable cooperation and teamwork among people with different views and skill sets, are an essential part of any successful and productive work environment. Teams in businesses are an excellent way to boost organizational performance, encourage creativity, and increase employee engagement and satisfaction, according to research (Devine et al., 1999). The existence of issues that a person cannot solve alone as well as the availability of knowledge and abilities among some persons that can only be discovered through teamwork are the two most important reasons why institutions need work teams (Abuzid, 2017).on other hand (Tullo, 2019) mentioned that the concepts of teams and teamwork are not new, for a very long time, there have been teams and team thinking. In addition to technical talents, employers are looking for workers who can collaborate with others and solve challenges.

A team is a collection of people who collaborate to achieve common aims and objectives for the benefit of customers and organizations in order to provide high-quality service 1

Team building, event planning, and activities have the potential to provide a strong sense of direction, workable ideas and solutions, a strong sense of belonging with and on the team, and clear strategic customer-focused values to the people your engagement. Similar to other administrative philosophies, the idea of work teams was developed with the intention of addressing the difficulties that resulted from it. Organizations can be challenged and assisted in achieving their objectives. Despite the initial attempts the world made (Lewis et al., 2019).

2.2.2. Differences Between Teams and Groups

Teams are now a crucial component for accomplishing organizational goals and objectives in the workplace. Managers who rely on teams to achieve goals must comprehend the idea of teams and the distinctions between teams and groups. In both study and practice, the terms team and group are frequently used interchangeably. They are not the same notions, even if they partially share the same qualities and define social units that work in larger organizations, according to certain studies(Vangrieken et al., 2017).

According to researcher's team is any group of people cooperating to accomplish a common objective. Interdependence, shared accountability, and mutual responsibility define a team. While the group: In general, mutual affiliations or interests lead to the formation of groups. Members of the group might not be interconnected or share accountability for outcomes. Previous research has shown that efficient (Contu & Pecis, 2007).

According to Vangrieken et al. (2016) the term "group" is used and defined more generally than either, which is the primary distinction between the two: Although all teams are groups, not all groups can be referred to as teams because they don't always match the requirements listed in the definitions of teams Groups do not need to meet the requirements listed in the description given above for them to be considered teams, though. When referring to many entities that have significantly distinct properties, the concept group itself can be used to refer to a range of meanings.

2.2.3. Definition of Teams

According to the numerous points of view, interests, and subject areas of the researchers, the conceptions of work teams have proliferated and changed. Some of these definitions are worth highlighting, such as:

A team is a collection of individuals who cooperate to complete tasks and share responsibility for outcomes. Additionally, they view the world and everyone in it as a cohesive social system that is a component of one or many larger social systems. (Such as the business unit or the corporation), and they manage their relationships across organizational boundaries. Teamwork is defined by (Volkov & Volkov, 2015) .The ability to collaborate with others in pursuit of a common purpose serves as a catalyst for ordinary individuals to achieve extraordinary results. Collective action is commonly recognized as a positive factor for teamwork and essential to the success of any organization. While (Katzenbach & Smith, 1993). defined Teamwork as "a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they are mutually accountable .as well as team can be defined as a collection of people who work together to fulfill the same functions and goals in order to provide excellent service. Bruce Tuckman's "team phases model" is the most well-known teamwork theory (Contu & Pecis, 2007). Teamwork is the process of working cooperatively with a group of people to achieve a common goal. Teamwork is one of the organizations' missing links (Askari et al., 2020). Therefor (Schmutz et al., 2019) describes the work teams on the basis of the limits of their temporary and permanent nature, the possibility of exchange between their members, and the tasks they perform within the team. according to (Flores-Szwagrzak & Treibich, 2020) In order to accomplish a variety of specific tasks, such as problem-solving, achieving creativity and innovation, improving the decision-making process, inspiring people through teamwork, following up on and monitoring work in the organization, and achieving high levels of employee satisfaction, work teams are crucial. On the other hand, social groups still in existence whose members cooperate to accomplish a common goal. They clearly define the boundaries between members and non-members. They collaborate to create a final product for which each participant has communal rather than individual responsibility. Additionally, they are at least moderately stable, which provides the group's members time to develop their interpersonal skills (Hackman,

2012). There are many definitions of work teams of specialized writers, but there are common points collected Between these definitions and in light of that, it is worth getting acquainted with these points for the work teams, as follows the next:

By combining these definitions, one may say that a team is a distinct group of people who identify as a team and work together to accomplish common objectives for which they accept responsibility and hold one another responsible. Members are interdependent in their tasks and results and mutually dedicated to the common goal and task.(Vangrieken et al., 2017).

2.2.4. Importance of Teams

Due to institutional requirements and the need to establish a work team, there are numerous types and patterns of work teams. For the institution to achieve high performance efficiency and effectiveness, it must establish a distinguished and highly qualified work team and select an appropriate person to build this team.(Hickey et al., 2019) And Differences between persons on any trait contribute to the feeling that another person is different from oneself, according to most definitions of team diversity. These distinctions, according to academics, are both the key to team innovation and effectiveness, as well as their downfall. One of the numerous variables influencing team innovation is diversity. Diversity of people, ideas, and viewpoints may be a major source of inspiration, as the level of diversity can be defined as age, racial, and gender distinctions that are readily apparent, or physical traits of a person that can be determined during the first few minutes of engagement. Prior to having a vocal dialogue, most people create their opinions (van Knippenberg et al., 2020).

The researcher Söderhjelm.(2018) emphasized that the adoption of the principle of teamwork gives organizations the best performance possible because of the synergy and integration of the efforts of the members of the work teams, each in accordance with his or her skills and specializations, as well as the fact that it represents the ideal environment to boost the morale of the workers and develop a sense of loyalty to their organizations and push them to put forth their best efforts to provide. Teams formed inside an organizational structure to complete a particular task or goal that calls for cooperation, communication, and integration between team members are accountable

for completing these tasks, and the team has a considerable level of decision-making power (Izam Ibrahim et al., 2013) .

Van Der Lippe & Lippényi. (2020) Describe the advantages that teams can achieve through their individual efforts, personal satisfaction, integration and diversity of capabilities and skills, as well as how this increases the organization's flexibility. The shift to the team's method is a key factor in the organization, as it helps to break down barriers, support employees, and promote the use of creativity.

According to He et al.(2019) The value of creating a work team also stems from the technology and contemporary work methodology that make it easier to comprehend and evaluate other people at work, as well as to learn about each person's motivations, plans, and capacities for thought and creativity. This knowledge facilitates dealing, which is demonstrated in the integration of members and the coordination of efforts. assisting in and facilitating the resolution of conflicts, disagreements, discrepancies, and miscommunications. Additionally, it helps to increase influence, support, trust, agreement, and goal achievement.

It is important to note that there are various sorts of work teams based on their goals, and when an organization needs to form or re-form a work team, choosing the right type is its first challenge.(Robijn et al., 2020).

There are different types of work teams in organizations depending on the organization's need for them, the level at which they operate, the reason they were formed, as well as the length of time the team works for and the type of task that is given to it. Given that work teams are one of the requirements for the success of implementing modern management concepts through placing an emphasis on cooperation and encouraging participation, The next paragraph will cover this kind of work team since it is the subject of the current study due to the significance of the senior management team and its role in decision-making, setting, and monitoring the implementation of strategies for the company as a whole (Larson & DeChurch, 2020).

2.2.5. Top Management Team

The corporate environment has become more complicated and dynamic over the past few decades, which has had a considerable impact on the management sector.

Organizational management has grown increasingly difficult, and firms are now aware that the effectiveness of their top management team (TMT) is crucial to the success of their operations. Due to its special role in influencing corporate strategy, decision-making, culture, and results, TMT is essential. Because TMT are crucial to creating and implementing the corporate strategy, it has become crucial for firms to concentrate on choosing, developing, and keeping the best TMT (Kolev & McNamara, 2022a).

2.2.6. Concept and Definitions of top Management Team

Despite the great importance of the topic of the top management team and its study in both the field of strategic management and the theory of the organization as an argument, the interest in studying this topic did not take wide interest from researchers until nearly twenty years ago Referring to each (Halevi et al., 2015) , (Ali & Konrad, 2017), (Barrick et al., 2007a) , (Kolev & McNamara, 2022b).

Individual leadership and collective leadership, as well as individual management and collective management, have been at odds throughout history, the formation of the so-called senior management team has become more popular as management theory has advanced. Perhaps the need to clarify the teamwork strategy is motivated by the current climate at work, within an organization, teamwork fosters desire and innovation, speeds up interaction and communication, and produces fresh ideas (Shah et al., 2019) .

The top management team (TMT) is a group of senior executives who play a key role in an organization's strategic decision-making procedures. They are responsible for choosing the organization's direction, creating objectives, and making sure that plans are carried out in a way that will result in the accomplishment of those objectives. The top management team (TMT) is often composed of the chief executive officer (CEO), chief operating officer (COO), chief financial officer (CFO), chief marketing officer (CMO), and other C-level executives. The TMT members oversee a variety of organizational processes because to their diverse professional backgrounds. They work together to develop comprehensive strategies that are meant to address the needs and challenges of the organization. The TMT members' complementing skills, supportive interpersonal relationships, and open channels of communication are essential for fostering

collaboration. To foster effective communication, TMTs usually arrange regular meetings to discuss organizational difficulties and share information (West, 2012).

“that the top team, rather than the top person, has the greatest effects on organizational functioning”(Carmeli, 2008).This type of team is called the top management team which is usually formed by the chief executive officer of the organization and the main managers in it with the aim of formulating the organization’s strategy, following up on its implementation, and taking care of the interests of owners and shareholders, as well as other stakeholders (Gallén, 2009).

Due to the difficulties that environment presents for business organizations and the demand for a variety of knowledge, abilities, and experience, a group of executive managers standing in for the organization's strategic leadership is anticipated (Ansoff et al., 2018).

Top Management Team (TMT) in directing the company's strategy and its impact on the financial performance of the company. The work of Hambrick & Mason (1984), which theorized the centrality of the "dominant coalition" in formulating corporate goals, putting strategies into practice, and obtaining predetermined results under the name of Upper Echelons Theory (UET), has been the milestone in this field. According to their paradigm, an organization's results reflect the personality, traits, and actions of the people at its top (Quarato et al., 2017).

However, the study of (Hambrick & Mason, 1984) marked a turning point in the investigation of top management teams and affecting elements marked by the viewpoint of higher groups (upper echelons perspective) which is regarded by the majority of academics in the field of senior management teams as having lit the initial research spark since it was followed by a lot of studies over the course of the next 20 years (Neely Jr et al., 2020). The TMT was developed by Hambrick and Mason in 1984 as the analytical unit for examining how senior managers influence organizational decisions and final results. making it one of the most active subfields of strategic management study. Later, Hambrick (1994) outlined five conceptual components, including team makeup, structure, process, incentives, and the leader, for a thorough understanding of TMTs. Despite the fact that four of these conceptual components have already been thoroughly investigated (Simsek et al., 2005).

The upper echelon theory proposed that the TMT is responsible for company outcomes. This notion was expanded upon by a number of researchers. The human capital of executives who are attracted to and maintained in the TMT, as well as behavioral variables, are major predictors of how successfully specific TMTs digest information, allowing them to make strategic decisions that affect corporate performance (Abatecola & Cristofaro, 2020) . The upper echelons hypothesis also emphasizes how contextual factors affect how TMT characteristics, strategic decisions, and company outcomes are related.(Luo & Lin, 2020).

The researchers concentrated on the impact of the group of TMTs that referred (Haleblian & Finkelstein, 1993) as the dominant coalition It depicts the individuals that perform the specialized tasks necessary to keep the organization operating. Despite the importance of the CEO's position in the strategic decision-making process, it is difficult for the individual to oversee all parts of work in the firm on his own due to the limitations and difficulties provided by the external environment's quick changes.the researchers(Hambrick et al., 2015) highlights the challenges imposed by business organizations and the need for knowledge, skills and experience diversity requires a team of executives that represents the strategic leadership of the company and is the top management team (Barron et al., 2011).

The top management team (TMT) has the power to choose the direction of the company, it has additional influence over innovation. (Bonyuet, 2019b).

Ma et al. (2022) in their research determine three distinct conceptualizations of TMT functions the majority of academics hold an operational perspective of TMT roles, where the roles are seen as structural designs to satisfy certain needs of strategic decision-making and organizational direction. This comprehension is frequently linked to theoretical viewpoints like contingency theory for (e.g., Hambrick and Cannella, 2004), dynamic capabilities perspective (e.g.,Kor and Mesko, 2013), information processing theory (e.g., Guadalupe et al., 2014), and the attention-based view (e.g., Fu, Tang, and Chen, 2020).

Johannes. (2014) also posted the question: “What is the role of TMT during innovativeness?” Upper Echelons perspective and provided some answers by showing that the leadership style of the TMT mattered for innovativeness, depending on the organizational size and organization type. Executives and academics similar frequently

use the top management team of today. This emphasis on top teams is a significant advancement in the way executive leadership is perceived because it acknowledges that running a business is often a shared effort that involves many people in addition to the CEO. Although senior leadership is crucial, CEOs don't always decide on a course of action (Singh et al., 2019).

We can observe that many of the TMT members' unique personal traits will affect how an organization innovates. Much earlier, Hambrick & Mason (1984), in their groundbreaking work on the "Upper echelons perspective," claimed that management traits can predict organizational outcomes including strategic choices and performance levels.(Venugopal et al., 2020) Since they are already multifunctional teams, the top management team is distinguished by the diversity of knowledge, experience, and skills among its members. This diversity helps to ensure that they have all the required components for making excellent judgments, and this is supported by (Dahms et al., 2022)by stating that the top management team is diverse and that this diversity ensures the team's integration in terms of knowledge, expertise, and experience to lead the activities of the organization as a whole and contributes to the generation of diverse ideas and different information, the organization is spared the risk of decisions being made that are incorrect due to the convergence of similar opinions (Raes et al., 2013)Compared to teamwork at lower levels, higher level teamwork is more effective in achieving the desired goals and this was confirmed by both (Sanyal & Hisam, 2018) and (Driskell et al., 2018).

2.2.7. Importance of TMT

According to strategy theorists, firms must adapt to their environment in order to survive. As a result, the top management team must be able to predict changes in the qualities that support market advantage and, as a result, respond rapidly to competition concerns. The mental maps generated by the top management team to outsmart the competitors are represented in strategy (Mayende & Joseph, 2020).

Depending on where an organization is in its lifecycle, TMTs will have varying personnel needs. For instance, the traits of a successful TMT may vary according on how much they focus on innovative, growth-oriented strategies versus maintenance-

oriented methods. As an organization grows, the decision-making process is likely to become increasingly decentralized and participatory.(Velinov & Malý, 2016).

Wageman et al. (2010) define management team as "a group of persons, each of whom has a personal responsibility for directing some element of an organization, and who are interdependent for the goal of providing overall leadership for a broader enterprise."

From the previous abstract according to researchers that the composition of the top management team includes individuals with important senior positions in all entities, which are supposed to be selected on the basis of objective criteria that depend on competence and experience, since this team is responsible for drawing up the policies and strategies of the institution and defining the vision and mission of the institution and its objectives and the activities that will be practiced and the distribution of resources between the various activities, which require extensive knowledge of the establishment's operations as well as extensive knowledge of the general and private environment of the group and forecasting environmental variables and responding and preparing for them, and this requires continuous insight, attentiveness and creativity in reviewing the establishment's plans future.

2.2.8. Top management team behavioral (TMTB)

2.2.8.1. Concept of top Management Behavioral

An effective team must have interaction between its members. The team cannot function effectively and efficiently enough to accomplish the objectives for which it was founded without this interaction state. The more closely the team members interact with one another, the better the team will be in achieving its objectives (Zhou et al., 2022). The (Hermano & Martín-Cruz, 2016) explained Because they depend on one another for decision-making and because they have particular responsibilities in regard to the organization's goals as executives, the top management team stands apart from the other work groups.

The top management team (TMT), also known as the "dream team," is made up of the best and brightest people who are brought together in the hopes that their individual talents will complement one another. It was first introduced years ago but has

recently rekindled the interest of researchers whose experience with organizations has shown that the arrangement of the single omnipotent CEO at the top of the firm has outlived its utility. The TMT can be seen of as the organization's overall information and decision-making unit. Its inner circle of executives comprises the TMT, and together they create, articulate, and carry out the strategic and tactical decisions of the business. This article explains a model of such organization (Klenke, 2003)

Two major research trends can be defined (a) TMT composition and (b) TMT processes. The TMT composition is a key feature of upper echelon theory as developed by Hambrick and Mason (Carmeli, 2008).

And the researchers such as (Boone et al., 2019) and Click or tap here to enter text. (Patrício & Franco, 2022) also (Talha et al., 2020) and (H. Wang et al., 2022) Discovered that there are two tracks of research that deal with the factors and variables that determine the effectiveness of the Top management team in achieving organizational success such as top management team composition and top management team process.

The top management team has important responsibilities related to the objectives of the firm since it is unique from other work teams in that its members are executives in a special capacity and because they depend on one another as members of the decision-making team (Barrick et al., 2007b).

Nevertheless, research in the ‘upper echelons’ stream (Hambrick and Mason, 1984), which typically investigates how (diversity in) TMT members' (demographic) traits and experiences affect organizational outcomes yields conflicting findings (Buyl et al., 2014a).The term "behavioral integration" was created by Hambrick in 1994 to characterize how often the team interacts with one another. As well as the group through three processes: the number and quality of information sharing, accessibility, timeliness, correctness, cooperation, and involvement in decision-making.(Cho et al., 1994).

Top management team behavioral ability to take use of the key features of teamwork, tasks, and behavioral tendencies is referred to as behavioral. It enables team members to have a deeper and more thorough grasp of the knowledge that is shared among them, and such integration results in either more efficacy (better decisions) or higher efficiency (lower costs or faster decision-making) (Wan et al., 2020).

2.2.8.2. Definition of top Management Team

The behaviorally integrated team is defined by strong interaction that leads to an open exchange of information, decisions, and solutions that are the outcome of collaborative action, these decisions ensure a strong commitment and continuity in following up on implementation by team members (Wan et al., 2020).

The primary area of interest for the upper echelon theory put forth by (Hambrick & Mason) is the top management team's composition. According to this theory, the top management team's size, age, length of service, educational background, and job are all reflections of the organization's characteristics. Additionally, the traits serve as influencers of the firms' strategic decisions, which in turn affect firms' success the team's demographics, process, and organizational performance are the three key concept clusters of interest in upper echelons study. In contrast to process, which is concerned with the team's activities and behaviors, such as communication, and psychological aspects, such as social integration, demography refers to the team's aggregated external characteristics, such as heterogeneity, tenure, and size (Sambharya, 1996).

According to Hambrick and Mason (1984), Demography is a significant, causal factor that influences a number of other variables and processes, as well as a number of organizational outcomes through them. studying observable demographic characteristics, like years of experience, can help researchers circumvent the challenging issue of getting access to executives to measure psychological or group dynamic variables, which may be the more direct underlying process characteristics connecting the top management team's attributes to organizational performance.

Although no empirical research has specifically looked into the mechanism by which the demographics of the top management team affect organizational outcomes, numerous social-psychological hypotheses for the links have been put up. The idea of social integration was utilized by Michel and Hambrick (1992) to clarify relationships between average team tenure, diversification strategy, and performance.

According to Ouchi (1980), organizations may employ a variety of control tactics. While some businesses utilize more formal mechanisms like rules and regulations to formalize and govern member conduct, others rely on strong informal cultures and systems of values. Because of the goal and informational ambiguities between the chief executive officer (CEO) and each member of the top management

team, diverse teams will be less predictable in their attitudes and behaviors. According to Holmstrom (1979), this predictability can be restored by a CEO who keeps an eye on team dynamics. The CEO can prevent opportunism on the part of team members by creating rules and regulations (Eisenhardt, 1989). Thus, the CEO will typically rely on formal rules, laws, and processes to coordinate and regulate the activities of diverse team members. (Smith et al., 1994a).

Even though the research on the composition of the top management team was successful in establishing a connection between the team's demographics and organizational performance, some researchers are of the opinion that it fell short of illuminating the mechanism by which these traits can be translated into organizational outcomes and that some theories and presumptions related to them remain untested (Henry et al., 2019).

Although there is more research than ever before on the top management team and how it affects organizational operations and outcomes, it is still unclear how to effectively manage the top management team's complicated activities. The senior management team has received a lot of attention in the research. Without taking into account the overlapping process structures, top management on the relationship between the demographics of its members and the organizational outcomes (Smith et al., 1996).

The social processes and mission-achieving procedures created for the existence of the team trait in top management served as the foundation for the definition of TMT behavioral integration (Shlaka & Jassem, 2022).

“According to Hambrick (1994) behavioral integration is a meta construct that encompasses and integrates elements that were previously represented by separate constructs, including social integration (referring to both perceived harmonious relationships and the affective component of member attraction that is often called group cohesion), frequency and quality of member exchange, and collaboration. Unlike constructs such as social integration” (Carmeli, 2008).

Several overlapping variables that influence several organizational outcomes are affected by the demographic features, which is supported by a number of overlapping variables. On the other hand, numerous research in the area of organizational philosophy demonstrates a great interest in examining the management team's operations. Because it improves corporate innovation processes (Song et al., 2010).

According to the upper echelon hypothesis (Hambrick/Mason 1984), managers' decision-making is constrained by the cognitive foundation and values they bring to the table. The cognitive foundation serves as a barrier between external stimuli and ensuing perception. According to the upper echelon perspective, demographic traits serve as observable indicators of the "givens" that managers consider important when making decisions. According to the upper echelon perspective, managers' attitudes, values, and cognitive processes can be approximated by demographic traits (Gallén, 2009).

Cao et al. (2010) formulated hypotheses on how the causes of behavioral integration affect the level of the CEO and the companies, developed the concept of behavioral integration and described it as a superstructure of the senior management team process.

TMTs are distinctive in that they are made up of high-status, highly compensated executives with a CEO who is clearly the leader. TMTs are also seen as having primary responsibility for their organizations and a variety of stakeholders, which makes them a significant factor in organizational level results. There is a need to constructively reproduce the contingency finding of team interdependence in TMTs given the distinctions between TMTs and the teams typically evaluated in small group research.(Barrick et al., 2007a).

The work of developing and implementing the company's strategy falls to top management teams, and CEOs must coordinate and manage team behaviors as part of their leadership role. Large teams pose more coordination and control issues than small teams do from the perspective of control. There is a greater chance of goal and knowledge asymmetries between the CEO and the various team members the bigger the team is. Because of these imbalances, it is impossible to rely on team members to "do their own thing." Therefore, formal rules, regulations, and processes are more likely to be used with large teams than small teams, just as they are in the cases of heterogeneous teams and short-tenured teams (Smith et al., 1996).

The demand for research into the "black box" of the top echelons rises in tandem with the amount of studies linking TMT and strategy. Scholars emphasize the urgent need for investigation into intervening mechanisms, noting that proxies like team size and functional backgrounds can be inaccurate.(Carpenter et al., 2004).

Dourish & Anderson, (2006)Emphasize that Top management team's behavioral expresses the phenomenon of the collective nature and the features of the cooperative phenomenon in the efforts and coordination between the members of the top management team and the distribution of tasks according to the capabilities of each member based on the fact that the team is made up of members with complementary skills who are committed to a meth .The top management team's high level of behavioral consistency will be more helpful in fostering consensus among viewpoints, increasing response time to environmental changes, satisfying the needs of various customers, and enhancing organizational success. The senior management team's behavioral integration is the extent to which the senior management team exercises its tasks and duties in a synergistic manner, sharing powers and resources, and taking accountability for the results achieved (Hashmi et al., 2023).

2.2.8.3. Top Management Team Behavioral Dimensions

Since team members are the owners of the association's orientations, behavioral integration is an interactive structure made up of three key components that are interconnected with one another to improve the quality and quantity of information shared among top management team members, cooperative behavior, and participation in decision-making. This harmony enables team members to make effective decisions conceptualizes behavioral as a fundamental idea that seeks to encompass this three central, connected, and enhancing aspects of the senior management team's activity (Shlaka & Jassem, 2022).

The majority of studies on behavioral of top management team show that it consists of three complementary parts or dimensions, The current study adopted the dimensions agreed upon by most of researchers for the purpose of measuring the level of behavioral of the top management team. Because most of the researchers agreed that the dimensions of the behavior of the top management team are each of (Participation in decision-making, Participative behavior, Exchange information) the researcher chose these three dimensions because this scale are largely proportional to the current study.

2.2.8.4. Participative in Decision-Making

According to the upper echelon's theory, managers' strategic decisions may be impacted by their personal traits, and these strategic decisions will have an effect on the business's achievement,(Bonyuet, 2019a)For nearly 50 years, organizational research has focused on participatory decision making, which is defined as shared decision-making or influence between hierarchical superiors and their subordinates (Carmeli et al., 2009).

Strategic choices are difficult, ambiguous, and have an effect on the organization's long-term viability. And important role of TMTs is to generate more better and faster decisions because these decisions have a substantial impact on an organization's performance and long-term worth (Ugwu et al., 2018).

It has been demonstrated that participative in decision-making is an administrative solution and a crucial component for the effective implementation of administrative strategies. Participation gives people the chance to look for new ideas and promotes mental and emotional reflection, both of which help people reach their personal and organizational objectives. Taking responsibility makes them feel like they're making a contribution to the success of the firm, which boosts their desire to work (Lam et al., 2002)

When a higher standard of decision-making is required, when the subordinates have sufficient knowledge and understanding of the problem at hand, and when the subordinates may not be able to implement the decision effectively unless there is agreement on the issue, participatory decision-making is most effective. Additionally, when an organization has a decentralized or less authoritarian structure, managers are more likely to switch from an authoritarian style to a more inclusive and participatory style because they believe that doing so increases organizational effectiveness and does not jeopardize their position of authority (Lawal & Yusuf, 2014).

Organizations should adopt the idea of inclusive decision-making and widen the scope of that engagement This is for several reasons:

- The expansion and growth of organizations despite having many self-abilities, the person might not always be able to know and understand everything.

- A climate of cooperation and commitment in front of Participants is facilitated through consultation and participation in decision-making.
- The decisions made are more insightful due to the diversity of experiences, viewpoints, and ideas; the actions taken are suitable for the demands of the scenario that involves the participants; and each participant's interest in the issue grows.
- It has an impact on decisions and processes, which helps to increase his experience, competence, and maturity.
- Increasing chances for initiative and innovation, which will enhance productivity and raise the standard of that productivity. Participating in the decision-making process entails accepting responsibility, which motivates people to volunteer for jobs (Oliver & Roos, 2005).

Members who participate in decision-making are more motivated, satisfied, and committed to completing the task at hand. This has a positive impact on improving organizational citizenship behavior, enhancing the information flow process, and improving communication(Papadakis, 1993).

The advantages of a good decision can therefore be lost if the team lacks the comprehension or dedication required to put the decision into practice or the desire to collaborate on further decisions in the future. However, making an effort to minimize fundamental differences will lower the decision's quality. Teams with less diversity tend to be less controversial than teams with more variety, but they will also have less skills and a lower chance of making decisions of excellent quality (Amason, 1996). A TMT that involves its subordinates in the decision-making process is said to practice TMT participatory decision-making. It is closely related to vertical information processing since it aids the team in gathering information from and disseminating information to its subordinates. Participatory TMT decision-making boosts subordinates' readiness to adopt management innovation and lowers resistance to the innovation's implementation. Participatory decision-making using TMT helps to develop and apply management innovation overall. Therefore (Su et al., 2021).

As well as there is another opinion of researchers Velinov et al., (2020) that the top management team was mentioned earlier that they have a great influence on the

decision-making process of organizations and, in turn, on the results they produce. They also play an important role in determining their strategic position.

Managers have a significant influence on how decisions are made in an organization because they are the ones who prepare for the process, which is required to consider the inputs of all members and arrive at a desirable decision in order to accomplish the stated goal and achieve job satisfaction, high performance, and overall effectiveness. The degree to which team members participate in decision-making on significant organizational issues is known as "joint decision-making," which is one of the behavioral integration dimensions. Joint decision-making improves the senior management team's ability to absorb information while also reducing the need for post-decisional coordination and information synchronization (V. M. Papadakis & Barwise, 2002).

According to Su et al. (2021) Top management teams' ability to innovate in management is facilitated by participatory decision-making due to two key factors.

- Involved decision-making helps the senior management team come up with sound strategic choices. In a process known as joint decision-making, information is shared and used to inform choices. The teams can successfully assess environmental developments and find opportunities because of the high amount of interaction between team members. They can also incorporate various knowledge, ideas, and viewpoints into shared strategic decisions.
- Participatory decision-making results in the top management team's collaborative commitment to strategic choices. Based on the aforementioned, participation in decision-making may be described as the process of senior management team members sharing perspectives and ideas while also learning from experiences according to objective principles and regulations that result in the attainment of shared objectives.

Not every company will be able to make full use of the top management team interface. Before creating a model that describes efficient interface processes by means of which the aforementioned functions can be accomplished, we first specify expected outcomes in terms of the quality of strategic decisions and their implementation. Strategic decision quality is the degree to which the essence of a strategic option is consistent with external pressures and the organization's goal, is financially responsible,

and is made in a timely manner (Raes et al., 2011). Another idea discovered that top management's thoughts and values have an impact on corporate strategy, which is the pattern of decisions based on the range of business that the company will pursue. Each organization has its own set of beliefs, which each top manager's decisions are impacted by. These beliefs serve two functions: they help explain a complex and ambiguous reality in words that are more relatable and clearer, and they give the organization continuity and stability in the face of change. The normative rational model of decision-making has an impact on the diversification strategy, which in turn has an impact on company performance (Goll & Sambharya, 1998).

Making strategic decisions is difficult. Managers frequently struggle with strategic decision-making processes, partly due to their complexity and partly due to the fact that these judgments are not routine. To reduce the uncertainty and ambiguity surrounding strategic decisions, a number of organized frameworks and methodologies, such as options theory, have been developed (Ireland & Miller, 2004)

Based on the above according to researchers' opinion the success of the organization is based on the senior management team's members' compatibility, harmony, and understanding. Tyranny of opinion and intolerance of the other cannot support or be a successful organization because the senior team members' sense of shared accountability will result in a form of self-censorship over all of the work they undertake. The decision-making process is a complex one that requires knowledge, intuition, foresight, and a broad awareness of its relationship to the future. It also benefits from experiences and the caliber of the information that informs the decision. Considering that the members participated in the decision-making process, senior management's ability to present opinions and ideas, gather data, identify, and evaluate alternatives, and reach creative solutions generates a high sense of commitment to those decisions and enables organizations to keep up with and address environmental requirements.

2.2.9. Participative Behavior

In recent years, there has been a noticeable shift from individual work to communal work, and there has been a tendency towards cooperation with an increase in the need for shared thinking and action on issues of highest concern (Schwatka &

Rosecrance, 2016). (Buyl et al., 2014b) define cooperative behavior is an integrated action used by individuals or groups to accomplish a common goal, whether it be a general goal shared by all members of the group or a special goal specific to one member of the group. The process of accomplishing common goals includes effective communication, mutual respect, and active participation from all members of the group. problems and establishing the optimal learning environment for challenging scenarios in the classroom that call for both cerebral and emotional effort to solve.

TMT cooperative actions, such as teamwork and information sharing between TMT members instead of being a disjointed, loosely tied group of executives, the TMT members act as a true team while exhibiting cooperative conduct. predict that high TMT cooperative behavior reduces the relevance of the sociopsychological forces of TMT member similarity and increases the CEO's reliance on the knowledge of its TMT members to delegate decision influence. The CEO is aware of the TMT members' areas of competence in collaborative teams (Buyl et al., 2014c). Interaction between members of the top management team is essential for a successful team, as it represents the team's capacity to execute its objectives efficiently and effectively (Kor, 2006).

Working together to finish a task and debating difficult difficulties is what collaboration entails. Effective cooperation requires both individually focused activities and dynamic groupwork. Coordination is described as the harmonious adjustment or interaction of several individuals or things to achieve a goal or effect. Top quality and performance are two sorts of human partnership. Team members engage in a number of activities within the organization, some of which help achieve goals. One is doing something concrete, such as working together to finish a task, while the other is talking to each other about how to solve some significant challenges (Chakraborty et al., 2020).

When top management teams collaborate, they can leverage their collective knowledge and specialties to make wise judgments. By using a collaborative decision-making process, the risk of mistakes is decreased, and the company's objectives are attained (Ke et al., 2019).

How effectively a top management team collaborates homogeneous unit and engages in mutual and collective contact is defined as behavioral integration. Members of a behaviorally integrated top management team can work closely together, support other team members, and respect collective decisions. All of these factors work together

to raise top management teams' attention to the natural or social environment and drive prosocial conduct. Furthermore, exchanging skills, information, and knowledge among top management team members may help to generate unique ideas (Afshar Jahanshahi & Brem, 2017b). Cooperative conduct indicates the level of support and cooperation among team members and highlights the social dimension of behavioral integration. Collaboration increases the top management team's capacity to deliver new products on schedule and under budget by allowing members to contribute their knowledge, expertise, and creativity to technical difficulties in addition to task planning and control. Due to two factors, collaborative conduct enhances innovation performance within the organization Both the act of exchanging ideas for new items and the implementation of creative ideas are made easier by collaborative conduct as clarified by (Liu et al., 2015).on the other hand. (Yi et al., 2017a) believe that top management team's cooperative conduct is a representation of the process of coordinating actions in a cooperative way so that they can accomplish shared objectives. When the team's members consistently work together to fulfill the objectives for which they were founded, cooperation is produced. In order to accomplish behavioral integration, which is one of the factors that determines its effectiveness, one must look for fresh knowledge and distribute it among the team members. Additionally, team members' shared mental traits enable them to realize the specific tasks assigned to each of them and assist one another in a way that increases mutual benefit because they believe in the value of cooperative work.

And it was pointed out by Smith et al.(1994b) that the top management team's social interactions are likely to improve as a result of treating one another with respect and value. As a result of these improved social interactions, the collaborative environment creates more opportunities for sensing knowledge sources inside and outside the organization at various levels, which improves dexterity, the organizational ability to follow up New and current knowledge simultaneously.

The top management team's cooperative behavior helps the group to capitalize on the complementary skills of the team members, expanding the range of roles that can be filled by the group and improving its capacity to respond appropriately to various situations in ways that enhance the members' diversity of behavior. Promote team members' engagement, dedication, and creativity to increase their level of behavioral complexity(Hyväri, 2016). also added by the author Rank & Tuschke. (2010), that the

team members' high levels of cooperation increase their sense of self-worth while also minimizing interpersonal friction. In order to improve the amount of information and mutual knowledge among members and hence assist learning processes, cooperation also promotes interaction and encourages interdependence amongst workers .When a team's members work together to accomplish the objectives that make up the team, behavioral and cooperative behavior is achieved at the level of the team members (Yi et al., 2017b). Because of the potential risks to the team's relationships posed by this affective and affective link, social integration must be combined with other task-related behaviors (such as information sharing and participatory decision-making) in order to be effective.(Buyl et al., 2014b).

Collaborative behavior is "the practices of the top management team, which is to coordinate activities among them in a cooperative manner to search for solutions to problems that exceed their individual capabilities." Cooperation between top management team members to complete tasks with accuracy and high speed and foster an atmosphere of social sympathy among team members is considered the motivator and stimulus for teamwork and dealing with disagreement in a thoughtful and rational manner, as well as facing problems that impede the completion of the required tasks and addressing them collectively. (Ghitulescu, 2018).

2.2.10. Exchange (share) Information

The success of an organization depends largely on how effectively its top management team communicates and shares information. The top management team of any organization typically consists of individuals holding executive positions such as the CEO, CFO, CMO, and other functional heads. These individuals are responsible for formulating and implementing the organization's strategic vision, mission, and objectives. In order to achieve these goals, a high degree of alignment and collaboration is required between team members. Effective communication and information sharing among top management team members can help achieve this alignment and collaboration. By sharing insights, perspectives, concerns, and updates on relevant issues, team members can collectively make better-informed decisions. top management teams that prioritize information sharing can improve organizational performance, minimize conflicts or misunderstandings, and foster a culture of transparency and trust

among team members, knowledge Information is increasingly being recognized as a potential source of increased team performance (MacCurtain et al., 2010b). Individuals assist and learn from others' ideas, facts, expertise, and judgments to build new abilities when they share information inside teams. As a result, team members sharing their knowledge is seen as a risk to the team's performance. Team members contribute information, experience, and opinions about specific tasks in order to share knowledge (Jamshed & Majeed, 2019), In order to support their partners' information operations, companies must develop efficient ways to manage information strategically. In the context of top-level managerial decision-making, this is crucial. Furthermore, the ability of an organization's leaders to uncover and gather the knowledge needed to make solid decisions and establish a viable business strategy determines its competitiveness (De Alwis et al., 2006). Projects resulting from digital information transfers have generated numerous adjustments. Changes in company procedures and employee information behavior have resulted from the transition from analogue to digital information. Thanks to the technology in place in the workplace, employees should be able to access complete and reliable information at any moment (Bălău & Utz, 2017).

Depending on the idea of Mesmer-Magnus & DeChurch. (2009) They think that collaboration is defined as two people or a group of people working together to achieve a common goal by sharing their knowledge and abilities. Collaboration is described as two people or a group of people sharing information between two individuals, two teams, or two organizations. It can occur in both traditional and virtual teams. Using cloud-based tools to share information and interact has become normal thanks to technological improvements.

To further encourage cooperation and teamwork among team members, information sharing in senior management teams is essential. The task of making strategic choices that affect the entire organization falls on top management teams. Team members may disagree on the appropriate course of action if effective communication and collaboration are lacking, which could result in disputes and unfavorable outcomes. By exchanging information, team members can develop a deeper understanding of the goals and objectives of the company and collaborate to achieve them. Furthermore, information sharing can increase the team's sense of transparency and trust, which can boost morale and motivation. Therefore, it is crucial for top management teams to prioritize information sharing and create a climate that values and promotes open

communication (Orey, 2021). On the other hand, sharing information among top management teams also makes it easier to spot issues and find effective solutions, when top management executives communicate information, they can draw on one another's viewpoints, experiences, and knowledge to pinpoint the source of an issue and develop workable solutions (Krishnan & Park, 2005).

Sharing information among the top management team also facilitates quicker decision-making. When all team members have access to the most recent data and are aware of pertinent facts, they can swiftly analyze the issue and come to informed judgments. Sharing information within a top management team can improve teamwork and collaboration in addition to fostering transparency and bettering decision-making. Team members are better able to cooperate when they have access to the same information and share goals (Singh et al., 2021).

According to the opinion of Vandavasi et al.(2020) People who are knowledgeable are willing to impart their skills, knowledge, and opinions to others in a practical way with the expectation that they will use that knowledge to further their careers. This is known as knowledge sharing; Employees can exchange knowledge and support innovation by using knowledge sharing as their primary method. Individual and team knowledge can be converted into organizational knowledge through knowledge sharing.

Citroen. (2011) made reference to the value and significance of information for administrative decisions when he said that every organization must make distinctive and important decisions to achieve high rates of efficiency and innovation, and that doing so requires attention to information and its quality so that obtaining, storing, and reaping its benefits becomes an essential investment activity.

The top management team needs information to help them see how the organization will look in the future and what kind of market they will compete in, given the significance of their positions and responsibilities. Since decision-making at this level tends to be unstructured, the information required at this level is carefully chosen, comes from an external source, and will be valuable for a longer period of time. It also requires a high level of experience and judgment in its application (Simsek et al., 2005b) ,It should be noted that failing to share information about the situation under study will probably result in a decrease in the team's effectiveness because failing to study any

information, no matter how simple, may result in leaving out one or more viable options for the case under study. The team either fails to comprehend the dangers that the organization confronts as a result of the decision the team makes, or it fails to recognize all the ramifications of the situation (M. F. Lo et al., 2021). The top management team will be better able to make informed decisions regarding knowledge research as a result of improved communication among team members, which will keep them informed of each other's actions and facilitate efficient task coordination (F.-Y. Lo & Fu, 2016).

The open and prompt sharing of information between team members, which enables the acquisition of useful knowledge and skills, is what distinguishes a behaviorally integrated team (Afshar Jahanshahi & Brem, 2017c).

Because of the direct interactions that take place among team members, it is more likely that new and original ideas will be generated to address the challenges that the team is having in its work the more information that is shared between team members. Through the leadership roles of creativity, adaptation, goal setting, and guidance, the process of information exchange enables the top management team to better adapt to the external environment of the organization. Morale, fostering an atmosphere of transparency, and monitoring and controlling internal information (Chillab & Dakhil, n.d.).

Sharing knowledge across top management teams fosters creativity and innovation. The open interchange of ideas and viewpoints that results from information sharing across departments and levels can result in the development of fresh, cutting-edge methods to problem-solving. When people have access to information from many organizational departments, it fosters creativity because it offers a diversity of inputs that can be combined in original ways. The exchange of knowledge encourages experimentation and risk-taking because it gives workers the confidence to test out novel concepts and approaches in a supportive setting. This may result in the creation of novel goods, services, or business strategies, giving the company a competitive edge. In conclusion, the practices of the senior management team regarding information sharing can encourage creativity and innovation, which ultimately lead to corporate success and growth (MacCurtain et al., 2008). It must be noted that Organizational politics and aversion to change are two major obstacles to information sharing in top management teams. High-level managers may be reluctant to share specific information with one

another for fear that doing so could jeopardize their position within the company or lead to the rejection of their ideas. Top managers may also be hesitant to provide information that could result in significant changes to policies or processes because doing so might require them to give up some of their influence or control. The absence of trust between team members may act as a barrier to knowledge exchange in top management teams. Managers may be less reluctant to communicate sensitive or strategic information with each other if they lack confidence in each other's ability to keep it confidential or use it responsibly. This can impede team decision-making and overall performance (McDermott & O'dell, 2001).

(Huo et al., 2020)The success of the firm depends on the top management team effectively sharing information. In order to encourage knowledge sharing in top management teams, future ramifications and recommendations must be considered. The organization has to foster a culture that encourages discussion and idea exchange. To facilitate information-sharing processes and make sure that everyone in the team is on the same side, clear guidelines should be set. Regular team-building exercises can help to foster a cooperative and open atmosphere. Last but not least, technology advancements can be used to promote information sharing and improve the procedure. As a result, firms should make encouraging an information-sharing culture in top management teams a top priority if they want to maintain their competitiveness, boost productivity, and achieve long-term success.

2.3. Strategic Agility

2.3.1. Introduction

Chaotic situations call for novel strategies for surviving and succeeding. The only businesses that stand a chance of establishing and preserving competitive advantages are those that can adapt quickly to waves of change, regularly modify their strategic direction, and find novel methods to add value. Megatrends like demography, digitization, connectivity, trade liberalization, global competition, and the development of new business models are fostering the rise of new rivals and fostering innovative business practices (Holbeche, 2015). The capacity to adapt to sudden changes in the fast-paced corporate world is known as agility. A strong sensation of speed, lightness, and

nimbleness, agility also requires creativity and inventiveness, and companies must be nimble enough to quickly adjust to new difficulties and seize new opportunities in today's quickly evolving business environment. Strategic agility is the capacity to quickly change strategies and revise plans in response to shifting consumer demands and market conditions. (Elali, 2021a).

Depending on the believe of strategic agility, which refers to an organization's capacity to quickly adjust to shifting circumstances and unpredictability's, has recently drawn more and more attention from academics and practitioners. Economic, social, and technical changes have made it evident that old approaches to strategy creation and implementation may no longer be successful in today's business contexts, which are dynamic in nature. Researchers have concentrated on understanding the key causes and results of strategic agility, as well as the methods and practices that organizations can take to improve their agility, in order to meet this challenge. intends to contribute to a deeper knowledge of strategic agility and its significance for organizational performance and success by integrating and assessing the findings of prior studies (Santala & others, 2009a).However (Arokodare & others, 2020a) mentioned about ongoing instability in the corporate world today is a result of technical development, globalization, and heightened competitiveness. Organizations need to embrace strategic agility, which is the capacity to swiftly alter course, innovate, and align corporate resources with altering market demands, in order to experience sustainable success. Developing flexible strategies, predicting market upheavals, and fostering an innovative and risk-taking culture are all aspects of the complex and dynamic idea of strategic agility. However, (Kumkale, 2016) In order to provide strategic agility, one must continuously monitor both internal and external surroundings, gather and use information swiftly, and react however. developments quickly.(Wirahadi & Pasaribu, 2022).

The American recession of the 1930s and the 1980s lack of competitiveness in the nation's sectors are tied to the history of agility, The word "agility" was first used by the Iacocca Agency in 1991. One of the keys to fixing a problem when there is turbulence is adaptability (Rotich & Okello, 2019a).

Strategic agility is a term that is being used frequently in today's business world and has become a defining characteristic of successful organizations. Strategic agility refers to the ability of an organization to respond swiftly and effectively to changing

market conditions, technological advancements, and customer demands while also remaining focused on its long-term vision, mission, and goals. It involves developing a culture of innovation, experimentation, and continuous learning to respond to changing market dynamics effectively (Shams et al., 2021a).In another term strategic agility requires an organization to embrace a holistic approach that balances short-term operational efficiency with long-term goals and objectives. It is characterized by a flexible and adaptive organizational structure that promotes collaboration, transparency, and accountability at all levels of the organization. Organizations that possess strategic agility can leverage their capabilities, expertise, and resources to remain resilient and thrive in today's dynamic and unpredictable business environment (Prange & Hennig, 2019).The creation of management agility, which will aid in better managing innovations, is strongly advised for all firms that want to maintain their competitive edge (Lootah et al., 2020).

Doz and Kosonen (2008a, 2008b, 2010) provide a more extensive development of the idea of strategic agility. They contend that strategic sensitivity, leadership unity, and resource fluidity are the three components that make up strategic agility, (Reed, 2021).

2.3.2. The Concepts of Strategic Agility

A notion called "strategic agility" can be used in a variety of businesses, because it is believed that businesses that are nimble and quick to adapt to changes in the external environment function best, agility has become an interesting strategic issue (Agbeche et al., 2021).

Building strategic agility inside a business is a strategy to control risks and unforeseen changes that businesses encounter. The idea of strategic agility has recently received a lot of attention in the field of strategic management. It describes an organization's capacity to change with the business environment in a proactive and dynamic manner without sacrificing its core aims and objectives. Strategic agility basically refers to the capacity to strike a balance between short-term adaptability and long-term planning and thought. Although there are many definitions of strategic agility, flexibility, responsiveness, and adaptability are the common characteristics (Shams et al., 2021b).

Organizations that possess strategic agility are more likely to be successful in the dynamic, quick-paced corporate climate of today. Research suggests that strategic agility can be developed by proactive planning, fostering a culture of innovation, encouraging cross-functional communication, and investing in technology and human resources. Studies have also shown that organizations that have high strategic agility are more likely to be resilient and competitive over the long term, making it a critical aspect of strategic management (Ahammad et al., 2020).

Strategic agility is based on a number of management theory ideas that are related to the success of organizations during difficult times. We deepen our understanding of strategic agility through the theoretical lens of dynamic capacities a company's dynamic capability is its capacity to combine, develop, and reorganize its internal and external competencies and resources to respond to surroundings that are changing quickly (Sampath & Krishnamoorthy, 2017a).

As a concept divided into responsiveness and knowledge management. Strategic agility is further defined as the capacity of a company to identify changes through opportunities and risks present in the business environment and to deliver a timely reaction through the recombination of resources, processes, and strategies. An detailed review of the strategic agility literature reveals how agility businesses need to be responsive, competent, adaptable, and quick to flourish in a competitive environment and obtain a competitive edge (Arokodare & others, 2020b). The organization should have all five of the agile competencies when discussing strategic agility, which are as follows: Operational agility enables the company to gain dynamism through its operational resources. Analytical agility allows the business to modify the tools and methods of analysis. The ability to think creatively and quickly to tackle challenges that the organization hasn't faced before (by offering a novel, non-traditional solution or seizing new chances presented by the environment, for example) is known as innovative agility. The ability of an organization to negotiate and persuade others and persuade others of the importance of their ideas using words and rhetoric is known as communicative agility. An organization may recognize the long-term effects of its decisions when it has insight (Prasad, 2018).

2.3.3. Definitions of Strategic Agility

Agility has been described as the capacity to adapt rapidly and successfully to shifting trends, driven by specially developed goods and services, in order to survive and thrive in a competitive environment of continuous and unpredictable change, and Strategic agility is the capacity to use resources from across the value chain to change course quickly and deliver the right product at the right price wherever. Learning to pivot quickly and being able to alter and rejuvenate the organization without losing momentum are further examples of strategic agility (Sherehiy et al., 2007).

Use the phrase "strategic agility" to describe an understanding of "the ever-increasing complexity and turbulence of their environments by developing the necessary capabilities of flexibility and responsiveness (Ekman & Angwin, 2007) . (Y. Doz & Kosonen, 2008) popularized the term strategic agility in their book Fast Strategy, which was based on their research into businesses exhibiting this competence. It denotes that a company can act swiftly, decisively, and successfully as well as initiate, foresee, and capitalize on change.in other terms Strategic agility refers to a company's ability to adjust to changing circumstances on a continuous basis. It also allows for the utilization of opportunities, the production of value, and the satisfaction of clients with high expectations (Soltaninezhad et al., 2021). Strategic Agility is an activity and a firm's ability to absorb multiple alternatives for the firm's improvement. Several studies using various analytical units have found evidence that strategic agility has an impact on firm performance. However, need more evidence, particularly for research unit analysis (Nurjaman et al., 2021). Strategic agility has been linked to leadership, which has been identified as a crucial precursor(Y. Doz & Kosonen, 2008). Being known for being environmentally sensitive, having the capacity to continuously, inadequately, and incorrectly adjust to the strategic direction of the core business in respect to changing circumstances (Djaja & Arief, 2015).

Alsharah. (2020) states that muddled situations necessitate novel strategies for surviving and succeeding. Only firms that can remain flexible in the face of quickly evolving waves of change, adapt their strategic direction on a regular basis, and invent new ways to produce value will be able to build and preserve competitive advantages. (Weber & Tarba, 2014a) comprised on the idea of strategic agility as one of the characteristics that set new businesses apart because of their ability to adjust and sustain

constant flexibility in their operations. It is defined as having the capacity to adjust to changing business strategy as a result of strategic functions and to try to develop new goods, services, business models, and value-adding strategies. The capacity of a business to adjust to strategic changes that affect. Strategic agility is one of the most crucial factors in determining a company's success, especially in a chaotic or high-velocity environment. It is a company's capacity to remain adaptable in the face of new developments, to continuously adjust the company's strategic direction, and to develop new ways to create value (Fakunmoju et al., 2020b) . Performance can be increased through agility, which can enhance a firm's competitive activity inventory and allow for more appropriate responses to environmental changes. On the other hand (Tallon & Pinsonneault, 2011) emphasize that performance can be increased through agility, which can enhance a firm's competitive activity inventory and allow for more appropriate responses to environmental changes. Strategic agility is a methodical technique that uses dynamic capabilities to achieve diversity in the firm's product, process, and service composition in the business model (Weber & Tarba, 2014).

Strategic agility is a subject that has recently academics' interest and has a significant bearing on business success, strategic agility is the attentive and ongoing preservation of management's adaptability, perception, foresight, and strategic sensitivity in response to its internal and external settings. Regular internal and external environment monitoring, quick information gathering and usage, and quick market response are all necessary for strategic agility. By sharpening a company's competitive activity inventory and responding appropriately to external changes, agility can enhance performance (Kale et al., 2019) .Another definition of strategic agility, it is a notion made up of two elements: responsiveness and knowledge management. The ability of an organization to recognize changes through opportunities and risks present in the business environment, and to deliver a timely response through the recombination of resources, processes, and strategies, is how they further interpret strategic agility (Arokodare & others, 2020b). Strategic agility is defined as the organization's ability to look ahead, act and respond proactively to matters relating to strategy against internal weaknesses or external opportunities and threats faced by the organization (Nkuda, 2017).

Companies without strategic agility will suffer from a competitive disadvantage and a decline in firm performance in the 21st century, when globalization, technology,

innovation, and a variety of products make the economy borderless (Arokodare & others, 2020c).

Shams et al., 2021c)described the ability of a business to quickly adjust to shifting market environments and seize new possibilities is referred to strategic agility. This is achieved by combining proactive decision-making, adaptable organizational structures, and an innovative culture. Strategically agile organizations are able to foresee market changes and adapt to them quickly and effectively, as opposed to being caught off guard and forced to catch up to their rivals. (Lungu, 2018) emphasized that organizational leaders must promote a vibrant and empowering workplace culture where staff members feel free to share new ideas and take calculated risks in order to achieve strategic agility. Organizations must also be prepared to spend money on the infrastructure and technology needed to support quick decisions and flexible operations. Organizations may position themselves to successfully traverse the constantly shifting business landscape and prosper in the face of uncertainty by exercising strategic agility.

In this sense, we can define a procedural definition of strategic agility as: the capacity to be aware of market developments, adapt to shifting environmental conditions both internally and externally to maintain competitiveness, anticipate unforeseen future shifts or changes, and act swiftly to begin addressing them.

2.3.4. Importance of Strategic Agility

Organizations that possess strategic agility are more likely to adapt and respond to market changes and uncertainties. They are able to quickly identify profitable opportunities and shift their resources towards them. According to (Elali, 2021b) . Organizations can become more inventive and customer-focused thanks to strategic agility. As they can incorporate customer input into their product or service offerings in real-time, it improves their capacity for innovation. Additionally, strategic agility boosts resilience in the face of difficulty According to (Eisenhardt & Sull, 2001).

Organizations with strategic agility are able to continuously experiment with many strategy options until they find the one that works for them in chaotic conditions. They are able to keep their lead over their competitors as a result. Additionally, strategic agility develops a culture of flexibility and adaptability, which raises employee

engagement, morale, and general productivity. Therefore, having strategic agility is essential for firms if they wish to thrive in the fast-paced commercial world of today according to.(Oyedijo, 2012b) .

There are three dimensions of strategic agility, those are strategic sensitivity, leadership unity and resource fluidity, Because its work relies around the quickness of responding to unexpected events and seizing opportunities, strategic agility is crucial for the success of companies and their sustainable development in today's business environment, which is defined by complexity, ambiguity, and rapid change. The capacity to take advantage of opportunities, avoid risks in the workplace, and categorize situations as appropriate or inappropriate is crucial. Work in a financial setting (Sajdak, 2015) .

The capacity of a company to modify its strategy and operations in response to shifting market conditions, competitive threats, or technical developments is known as strategic agility. Due to the business world's quick pace of change, which is fueled by globalization, technological advancements, and altering consumer tastes, strategic agility has become more and more important. Companies with strategic agility can strengthen their competitive edge, reduce risks, and take advantage of opportunities. As a result, strategic agility is becoming increasingly recognized as a crucial component of success in today's business environment (Weber & Tarba, 2014b).

2.3.5. Characteristics of Strategic Agility

A detailed review of the strategic agility literature reveals how agility businesses need to be responsive, competent, adaptable, and quick to flourish in a competitive environment and obtain a competitive edge (Oyedijo, 2012a).

According to a new argument, senior management's consistent and coherent behaviors and talents, rather than a framework or a dualism, are what lead to strategic agility. The problems must be solved structurally in order to attain strategic agility. By using a micro foundational lens, it is possible to decipher the micro-social dynamics underlying such conundrums and promote strategic agility at the business level (Christofi et al., 2021).

Other scholars and experts have also stated that strategic agility is the best option for competing, remaining in the market, adapting swiftly to unforeseen developments, facing significant risks, and capitalizing on untapped market prospects through technical innovation (Rigby et al., 2020).

2.3.6. Forms of Strategic Agility

By implementing agile patterns that are appropriate for their environment and problems, organizations can become more flexible. These patterns are based on three types of agility with different degrees of change, as explained by(Prange & Hennig, 2019b).

- Flexible agility patterns aiming at stability within a situation where crisis or turmoil may be very detrimental to the organization and that it involves a low degree of change. This pattern deals with the ability to adapt to the crisis or return to a pre-crisis state, and its goal is to protect the organization or individuals from potential negative outcomes.
- Agility patterns are adaptable to accommodate diversity, aim at various degrees of change, and offer a volatile pattern of change, giving managers additional alternatives to vary the degree of change within a predetermined framework. While not in a disruptive manner, but rather by striking a balance between change and stability, this style encourages some degree of change and adds value by facilitating and pushing change.
- Transformational agility patterns, which strive for high levels of innovation and change while maintaining the organization's flexibility or leadership.

2.3.7. Obstacles to Strategic Agility

While observing that there are five key barriers to being fit: - The loss of an organization's and its leaders' interaction with its clients and staff, which results in a failure to recognize it and the passing up of possibilities. The leadership of the organization's incapacity to make systematic predictions and its ignorance of how to apply financial incentives dealing with long-term planning, as seen in its leadership in

implementing measures that support the new course. Leaders' concentration with everyday problems and the routine of work inhibits their capacity to foster frank debate about the future course of their organizations, and this is mirrored in the lack of time invested in imagining the changes that will take place in the future. The organizational structure is a barrier to securing potential prospects because it prevents effective performance. The motivating and appealing vision that is necessary for utilizing all of an employee's vigor, creativity, and agility is not effectively communicated by leaders (Setili, 2014).

Adopting strategic agility is essential for future success in the quickly shifting corporate environment of today. Long-term success will be more likely for businesses that can swiftly modify and pivot their plans in reaction to market changes, new technology, and other external circumstances. A culture of experimentation and learning, as well as a readiness to accept risk and uncertainty, are essential for strategic agility. Companies can prosper in the next years by cultivating these traits and making strategic agility a fundamental component of their corporate (Monyei et al., 2021).

2.3.8. Strategic Agility Dimensions

Proposed strategic sensitivity, collective commitment, and resource fluidity as three main organizational, meta-capability building blocks of strategic agility which “requires [the organization] having a keen awareness of incipient trends, the ability to quickly make bold decisions, and knowing how to reconfigure business systems and redeploy resources, (Y. L. Doz & Kosonen, 2010). assert that strategic agility can be implemented through the existence of three meta-skills that will increase an organization's agility: strategic sensitivity, leadership unity, and resource flexibility. Additionally, strategic agility necessitates maintaining predictions about the business's internal and external environment, perceptions, adaptability, and strategic sensitivity more delicately and quickly.

Since strategic agility is a new field of study, numerous researchers have offered opinions on what actually entails. (Doz & Kosonen ,2008) identified three components of strategic agility: resource mobility, collaborative commitment, and strategic sensitivity.

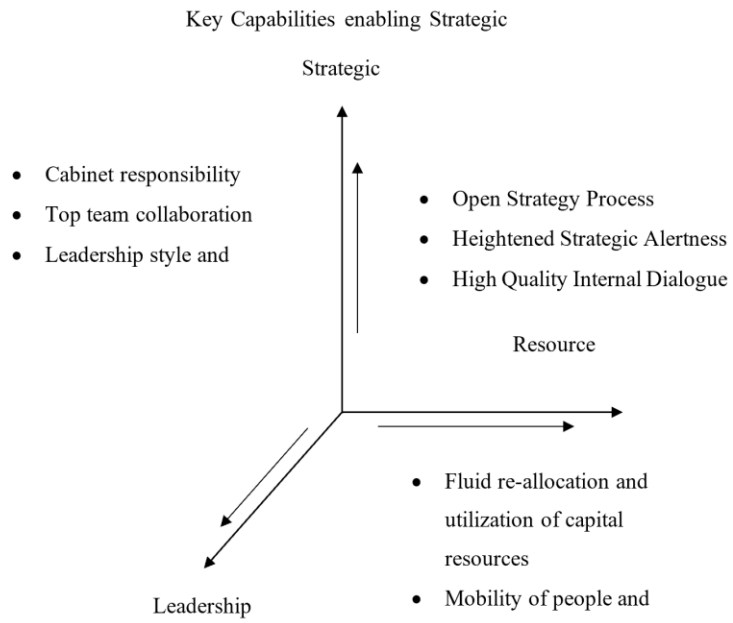

Figure 1: Key capabilities enabling strategic Doz and Kosonen (2008).

2.3.8.1. Strategic Sensitivity

The phrase "strategic sensitivity" has grown in popularity among companies hoping to succeed in today's dynamic and fiercely competitive industry. It speaks to a business's capacity to recognize and meet new possibilities and problems in an effective and timely manner. Any corporation that wishes to succeed and remain relevant in the hectic commercial world of today must understand this fundamental idea (Muhammad et al., 2020). Strategic sensitivity is the result of a keen knowledge of external trends and a collaborative internal strategy process. It has a proactive approach and involves an open planning process, increased strategic vigilance, and a focus on the future (Reed, 2021).

Strategic sensitivity refers to an organization's capacity for context scanning and knowledge acquisition, internal evaluation of its capabilities, and alignment of activities and behavior in a way that moves it closer to its goals and objectives, argued that strategic sensitivity can be both forward-looking and centered on the organization's current functions. Its main concerns are based on handling environmental uncertainties since it is concerned with choosing the optimal course of action based on knowledge and future forecasts (Agbeche et al., 2021).The ability to recognize and seize opportunities as well as comprehend environmental changes is referred to as strategic sensitivity.

Businesses must improve their ability to anticipate environmental change, research the future, and make decisions about what to do (Hock et al., 2016).

As well as explained by Flaih & Chalab.(2022a) as ability of an organization to comprehend and successfully react to the external environment is referred to as strategic sensitivity. It entails being acutely aware of the many trends and factors that have an impact on the commercial environment in which the firm operates. This comprises elements including new technological developments, rivalry, shifting consumer preferences, and prevailing economic conditions.

Strategic sensitivity is the capacity of an organization to comprehend and observe its internal and external environments, as well as the changes that are impacting them, by being open, perceptive, and insightful, and by grabbing chances before rivals (Elali, 2021c) , (Alsharah, 2020) defines Strategic as "the sharpness of perception of, the intensity of awareness and attention to strategic developments "When dealing with competitors, strategic sensitivity refers to an organization's grasp of its strategic orientation and perspective on how it may achieve its vision, mission, and strategic goals by seizing chances and acting promptly,(Sampath & Krishnamoorthy, 2017),Define strategic sensitivity as the ability to anticipate market events and developments before competitors. also,

It is defined by Y. Doz & Kosonen, (2008) as an organization's capacity to be extremely perceptive to its environment. This is sensitivity in terms of visual acuity, which is awareness of relatively weak signals or early signals and visual acuity to recognize and process them. It also comprises several organizational capabilities that, when used in high-level strategic debate in an honest and transparent manner, can help create a strategy that is more participatory or open.

Strategic sensitivity is a company's capacity to recognize changes in the business environment and to keep an eye out for potential dangers and commercial opportunities (Wirahadi & Pasaribu, 2022).

Mavengere.(2014) states that Strategic sensitivity is the ability to extract useful data from the environment, turn it into information, understand and analyze it to gain knowledge, and then spot opportunities and risks in the workplace. The ability to forecast market occurrences and changes ahead of competitors is known as strategic sensitivity. It entails cultivating and maintaining relationships with a variety of people

and organizations in order to gain access to as much information, insight, and innovations as possible. As a result, organizations must be market-oriented in order to recognize the need for change. It's a crucial part of a company's culture and a requirement for learning orientation (Sampath & Krishnamoorthy, 2017b).

Clauss et al.(2019a) argue that it also entails duties such as scenario planning and forecasting, distancing oneself from one's own business model to allow for critical analysis and the production of new choices, and obtaining an outside-in perspective from external colleagues. while I explained (Santala & others, 2009b) The best way to maintain strategic sensitivity and renew the organization is to bring in new blood with different skills and interests from the current workforce. Strategic sensitivity is a combination of foresight and insight, with great importance placed on insight. Strategically sensitive managers may foresee future variables and the direction of work areas that require good intuition. (Sull, 2009a).

Vrontis et al. (2023) Characterizes the same strategic sensitivity as regularly spotting and capturing chances earlier than rivals. contends that businesses must have mechanisms in place to hold employees accountable and reward them, as well as shared, accurate, and detailed real-time market data, a limited set of corporate priorities, and defined performance goals for teams and individuals.

The ability of an organization to comprehend environmental changes and detect impending dangers and opportunities is referred to as strategic sensitivity. and receive outside peers' perspectives from the outside(Clauss et al., 2019a). Strategic sensitivity is significant because it helps people and organizations adjust to shifts in the competitive environment. Companies that want to remain competitive must be able to adapt their strategy to the continuously changing business environment. Organizations that are strategically astute can proactively spot market dangers and opportunities, enabling them to create and put into action plans that will keep them one step ahead of the competition. Additionally, in today's fiercely competitive and customer-focused market climate, strategic sensitivity enables businesses to better comprehend the wants and preferences of their customers (Flaih & Chalab, 2022b).A collection of measures made by a company in a setting marked by quick and unexpected change is referred to as strategic agility. Agile organizations are ones that have high strategic agility, which is defined as

constant and frequent alterations in the organization's goods, processes, services, and organizational structures.(Weber & Tarba, 2014a).

Additionally, noted by (Debellis et al., 2021) that its significance resides in offering functionality so that the firm may respond quickly to changing circumstances Strategic sensitivity maintaining relationships with a variety of people and organizations to be as open to information, intelligence, and innovations as possible.

The Drivers of strategic sensitivity explained by (Y. Doz & Kosonen, 2008) as follow:

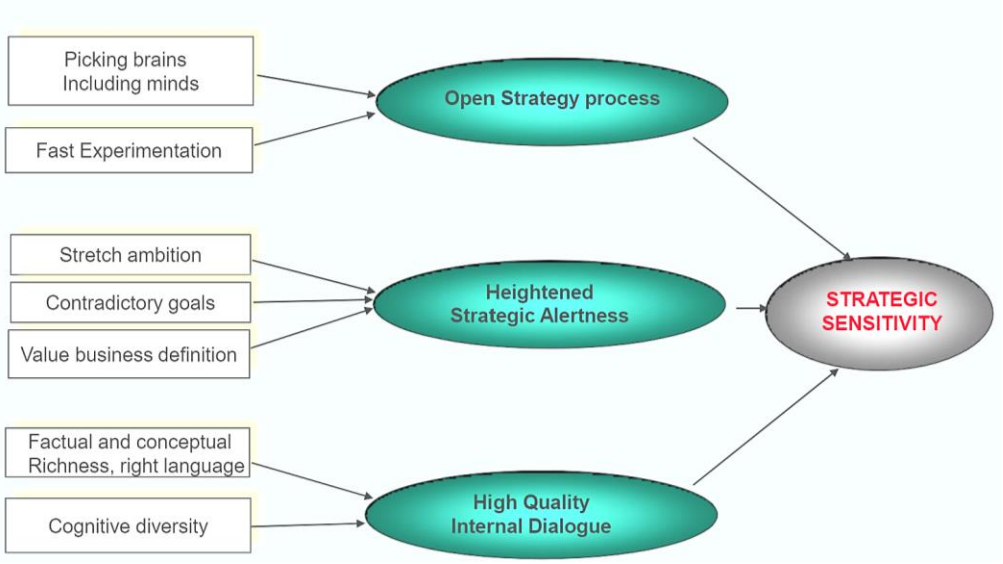

Figure 2: Drivers of Strategic Sensitivity (Y. Doz & Kosonen, 2008)

The ability to read events, comprehend and realize the dynamic environmental variables of strategic developments, identify early warning signs of weakness, identify impending threats and opportunities, and create visions and future ideas in response to those variables, allowing it to realize its vision, mission, and strategic goals through its strategic activities, is how we define the dimension of strategic sensitivity from this Three aspects of strategic sensitivity are as follows

- An open strategic process is one that incorporates practical expertise and scientific knowledge among the organization's staff, as well as strategic interaction with several stakeholders. Therefore, it depends on active collaboration with internal stakeholders, including research institutes, when

creating and molding the strategy to better the organization's reaction to various points of view and ways of thinking

- High strategic vigilance is the pursuit of increased vigilance, which entails being more proactive and looking for the best opportunities. It consists of three components: flexibility of vision, conflicting goals, and openness to the future vision, and it improves 3. the organization's capacity to define strategic questions in a novel and thorough manner. It demands shifting thinking in a more conceptual direction to increase the diversity of thought processes within the company.
- High-quality internal communication is the capacity to hold an intellectually honest strategic debate and strategic discussion in which people discuss comprehending and forming a shared knowledge of important topics. Additionally, it has two components: cognitive variety and factual and conceptual enrichment. This is what helps the organization transform individual ideas and points of view in the collective and shared direction of the strategy and boosts the organization's effectiveness (Pesonen, 2010).

To the best of our knowledge, there is no scale in the literature that assesses managers' sensitivity to the strategic management process. Businesses can calculate the total strategic management sensitivity index value for all managers using this scale. The generated index value can be used to compare results from related years and businesses. Knowledge can be accumulated by making links, monitoring, analyzing, and measuring the causality and interaction between theoretical frameworks.(Atas & Kasmoğlu, 2018).

2.3.8.2. Leadership Unity

Leadership unity refers to managerial responsiveness characteristics such as making rapid and bold choices with the support of the entire top management team and without individual political power struggles interfering. Timing is crucial in rapidly changing contexts (Clauss et al., 2019b)

Also explained by (Reed, 2021) Once a new strategic circumstance is identified, leadership unity, also known as collective commitment, enables the senior management team to quickly make decisive decisions. It entails interdependence, teamwork, and an

integrative leadership approach from the CEO. Once the top management has decided to make a change, strong decisions must be made to carry out the ideas. Collective commitment is the term used to describe this ability (Y. Doz & Kosonen, 2008).

Collective commitment the fundamental tenet of relevance is the presumption that via engagement, people become committed to the objectives and results of the group (Rose & Norwich, 2014a). Also, leadership unity defined by the ability of the organization to take action while having the support of the whole top management team (Wirahadi & Pasaribu, 2022).

A group's shared commitment to achieve a common objective is referred to as collective commitment. This idea has its roots in social psychology, a field of study that has long focused on group dynamics and behavior. A group that has a strong sense of shared purpose, values, and goals and is determined to work together to attain them is one that is strongly collectively committed. This can be observed in a variety of contexts, including corporations, political campaigns, and sports teams A group's shared commitment to achieve a common objective is referred to as collective commitment. This idea has its roots in social psychology, a field of study that has long focused on group dynamics and behavior. A group that has a strong sense of shared purpose, values, and goals and is determined to work together to attain them is one that is strongly collectively committed. This can be observed in a variety of contexts, including corporations, political campaigns, and sports teams (Ofoegbu et al., 2012). Collective commitment: is crucial to success because it fosters a sense of togetherness and teamwork among members of a group. High levels of group commitment increase the likelihood that members will work well together, overcome obstacles, and accomplish their objectives. Therefore, it is crucial for leaders to encourage team commitment among their members (Bal & Boehm, 2019).

Ability of the top management team to promptly make and implement innovative decisions and the organizational leadership to avoid "win-lose" politics are examples of leadership unity (Nyamrunda & Freeman, 2021), And indicated by (Santala & others, 2009b) Since everyone in the team is committed to the choice and feels responsible to carry it out, it is essential to have a shared commitment to decisions because it makes taking risky judgments simpler. The distribution of leadership responsibilities and the maintenance of a common strategy and shared values among the different units, the

team's commitment as a whole is a motivating factor and strengthens team cohesion, and the CEO's leadership style and abilities have a significant impact on the team's success, cooperation, and commitment. When assembling the top team, it is crucial that the CEO come out on top among his peers. Nevertheless, the first team needs to undergo some adjustments because performing the same task with the same team members for an extended period of time inevitably results in a loss in communication and individual motivation. And on the other hand Leadership unity is defined as the ability of members of an organization to understand and trust one another, allowing companies to make bold strategic decisions swiftly and urge firm members to commit to agreed-upon strategic changes collectively (Ahmad et al., 2020; Santala & others, 2009b).

A group's shared commitment to achieve a common objective is referred to as collective commitment. This idea has its roots in social psychology, a field of study that has long focused on group dynamics and behavior (Rose & Norwich, 2014b).

A group that has a strong sense of shared purpose, values, and goals and is determined to work together to attain them is one that is strongly collectively committed. This can be observed in a variety of contexts, such as corporations, political campaigns, and sports teams. The ability to work together as a team and feel a sense of cohesion inside the group is crucial to success. High levels of group commitment increase the likelihood that members will work well together, overcome obstacles, and accomplish their objectives. Therefore, it is crucial for leaders to encourage team commitment among their members (Royakkers & Buskens, 2002).

Alsharah.(2020) states that it also symbolizes an individual's commitment to an organization's goals and beliefs. This enables the organization to draft judgments more quickly, with more originality and differentiation, and so achieve excellence in meeting its objectives. (Sampath & Krishnamoorthy, 2017b) state that collective commitment is the organization's leadership and employees' shared commitment to the organization's goals. Collective commitment is the shared dedication to the organization's goals by the leadership and employees across the organization (Y. Doz & Kosonen, 2008).

It is crucial for the organization's senior leaders to work together and collectively commit to new projects with high risks that improve the indicator of the size of the organization. Collective commitment refers to the attributes of management response, including the speed of making bold decisions with the support of the entire senior

management team without engaging in individual conflicts in dynamic environments (Clauss et al., 2019a).

2.3.8.3. Resource Fluidity

The idea of resource fluidity has received a lot of attention lately. It describes an organization's capacity to effectively deploy resources, including people, cash, and assets, in response to shifting market conditions. This flexibility is essential for businesses to stay competitive in a fast-paced environment with frequent disruptions (Rotich & Okello, 2019b).Organizations need access to a variety of resources, including financial capital, human capital, and new technology, in order to do this. Particularly in dynamic industries that demand ongoing adaptation, the idea of resource fluidity has emerged as a major influence on the innovation landscape (Flaih & Chalab, 2022a).

Sampath & Krishnamoorthy. (2017b) Resource fluidity is defined as the effective allocation of significant resources for future development. Rapid response to new opportunities is predicated on the ability to successfully adapt resources and competences to changes in the environment, whether those changes are dangers or opportunities.

Clauss et al.(2019b) relate to the capacity to reorganize resources, information, and competencies to develop fresh approaches to value creation. Measures that are difficult to modify because they are ingrained in the structural system and can be quickly reconfigured (operational capabilities) have been identified.

A diverse portfolio of autonomous units is needed to do this, as well as a pool of general managers who can be moved around to oversee and monitor job progress. This is done in order to provide ongoing, permanent oversight of the work as well as a clear picture of the potential for personal professional advancement within the medium(Santala & others, 2009b).

Resource fluidity the ability to quickly shift resources from one activity to other development prospects(Nyamrunda & Freeman, 2021).

The capacity to coordinate and recombine the resources, expertise, and capabilities of businesses to accomplish desired results is known as resource fluidity(Wirahadi & Pasaribu, 2022).

Resource fluidity, according to Doz and Kosonen (2008), is the efficient distribution of substantial resources for future development. It is assumed that the resources and competencies at hand can be successfully modified to take advantage of environmental changes, whether they are threats or opportunities, in order to respond quickly to emerging opportunities

In other words, resource fluidity refers to an organization's capacity to collaborate with clients and partners within its network of business relationships in order to quickly and continuously reconfigure the combination of capabilities to relatively easily create an inventive movement. Organizational structures that improve resource fluidity, governance that aligns incentives and controls for misconduct, as well as systems that astutely manage knowledge and integrate co-specialization assets, can all help to achieve this strategic fit (Teece et al., 1997).

2.3.8.4. Importance of Recourse Fluidity

The degree to which resources can be redistributed and moved within a company or sector is referred to as resource fluidity. It entails a company's capacity to adjust to market shifts and restructure its resources to take on new possibilities and difficulties. resource flexibility can boost firm performance by allowing firms to quickly respond to market shifts and modify their strategy as necessary. Additionally, because internal resources can be moved and redeployed in response to shifting demands and priorities, resource fluidity enables firms to exploit them more effectively and efficiently. Flexibility, adaptability, and a readiness to experiment and try new things are key traits of resource fluidity. Organizations may increase their agility and responsiveness and so better manage the complicated and frequently shifting business landscape by placing more emphasis on resource flexibility (Kitur & Kinyua, 2020).

The ability to quickly reconfigure business systems and redeploy resources is referred to as resource fluidity. It also includes supervising strategies, mechanisms and collaboration incentives, supported corporate processes for operations and resource allocation, and approaches to managing people. Strategic agility suffers from resource confinement, stiff business systems, management gaps, and competency traps (Y. Doz & Kosonen, 2008).

Resource fluidity is a fundamental component of businesses. The idea of fluid resources highlights the value of adaptability and flexibility within an organization. Resource fluidity, however, involves more than just having an abundance of resources; it also involves their efficient and effective distribution. In order to preserve their core operations while still having the resources to take on new opportunities or problems as they present themselves, businesses must strike a balance between the demands of stability and agility. Ultimately, an organization's long-term performance and viability depend on its capacity to manage ephemeral resources (Priyono et al., 2020).

2.4. Firm innovation:

2.4.1. The concept of innovation:

Going back to the word's Latin roots may help define innovation. 'To make something new' is the definition of innovation, or the Latin verb 'innovate,' which leads to various deeper meanings. The Latin phrase is rather mysterious, but it makes more sense when broken down into three pieces. To create anything new, one must:

- Develop or realize a new concept (innovation and creativity).
- Transform this idea into a reality or product.
- Put this new idea into practice and market it.(Jason, 2013).

Researchers from many different areas have investigated and studied innovation extensively. For organizations, industries, and economies to expand and grow, innovation is essential (Wijngaarden et al., 2019) Although the idea of innovation is not new in the fields of business and management, researchers continue to disagree on how to define it and how it should be used , Each participant in the business industry must create their own products and services in order to keep up with consumers' shifting tastes and preferences given the expanding field of competitors and players in the marketplace.(Dagan et al., 2021). “The beginnings of the development of the theory of innovation and economic growth are connected with the analysis of Joseph Schumpeter (1934) who described the notion of innovation as the basis of technological progress and economic development in the sense of replacing old technologies with new ones, which he called “creative destruction”. In his study, Schumpeter identified five types of

innovation: introduction of new goods, new production methods, creation of new markets, discovery of new supply sources, and reorganization of industries "(Croitoru & others, 2012).

A very complete picture of the antecedent elements that support organizationally based innovation at the person, team, and organizational levels can be seen in the more than three decades of innovation research. However, because they take place at multiple and nested levels of human organizing, the processes that lead to innovation are complicated. A more detailed understanding of organizational innovation is also required by the commercial side of innovation (Rahmah et al., 2020). Innovation drives the progress of human civilization and contains the boundless vigor of human development throughout the development of the social economy. Innovation is the foundation of growth and the source of long-term viability in the analysis of enterprises. Exploring business innovation is therefore especially important (Suchek et al., 2021).

Every day, more people are becoming familiar with the idea of innovation. In the modern business environment, innovation capability is crucial. Due to this circumstance, businesses continue to operate in sectors where consumer preferences, technological advancements in the product-service sector, and competitive advantages frequently undergo unpredictable change. Companies must thus not only look for new prospects but also be very responsive to developments in order to succeed and achieve stability in performance (Tajeddini et al., 2006). In today's competitive marketplaces, innovation is viewed as a major factor in a company's long-term success, as a result, innovative organizations are able to respond to market issues more quickly and effectively than noninnovative businesses(Ghaben, 2015),Innovation refers to a company's propensity to encourage innovative thinking and the development of new methods for producing goods and services. Proactivity is frequently used to describe taking the initiative to foresee and seek new business prospects and engage in emerging markets (Martono et al., 2020).

Research at the upper echelons has focused on the connections between top management team traits and businesses and on Since the late 1990s, this bias has been mitigated by the development of firm-level innovation surveys that measure newly introduced innovations, such as managerial or organizational innovations, and the effect of such innovations on firm performance (Kraiczy et al., 2015a).

Corporate management allocation innovations can increase the company's operational efficiency and encourage further exploratory breakthroughs in uncharted territory. Effective corporate management allocation, in particular, may make the company's direction clear, increase efficiency, make the company's finances truthful and accurate, improve product quality, and establish a stellar corporate reputation (Haneda & Ito, 2018).

2.4.1.1. Definition of Innovation

Innovation has been defined in various perspectives such as:

Innovation is defined by (E. M. Rogers, 1995) as an idea, practice, or thing that a person or group perceives as novel. The various aspects and forms of innovation, including technological innovation, have also been studied in the past.

A new or considerably enhanced product (item or service), process, marketing strategy, or organizational strategy that is implemented in business operations, workplace structure, or external relations is referred to as an innovation (Erturk, 2014). Innovation is the method used to put an invention to use for the first time. It entails the creation of prototypes, initial design, and improvement or refining of the innovation. Diffusion is the process through which the innovation spreads into general use as it is embraced by more and more consumers. This process involves pilot plant testing and the creation of production facilities (Rahmah et al., 2020).

Innovation according to (Samad, 2012) is the deliberate adoption of new to the relevant unit of adoption ideas, processes, goods, or procedures inside the role, group, or organization with the aim of significantly advancing the interests of the individual, the group, organization, and society. This suggests that the context in which a novel concept, idea, product, service, or activity is used will influence whether it may be regarded as an innovation within that particular context. Also, Improvements in communication, new technologies for manufacturing processes, new organizational structures, and new personnel strategies or programs are all examples of innovation in an organizational setting.

The word "innovation" is frequently used while talking about technological developments, but it actually means much more Innovation is fundamentally the process

of developing new concepts, items, or procedures and putting them into practice. It entails the use of innovation, risk-taking, and creativity to create something fresh and beneficial. Any industry, including business and finance, healthcare, and education, can experience innovation. It may also be influenced by a variety of things, including public regulations, technology improvements, and consumer demand. An innovation's acceptance and execution, which can be influenced by elements including market preparedness, stakeholder buy-in, and cultural norms, ultimately determine its success (M. Rogers & Rogers, 1998). for innovations is that it is a process of getting new tools into a given social environment or a new tool itself. New studies shows that the definition is much broader. Innovations initiating new process or events, it also bring changes in behavior, personnel and approach and encompass much more than simply establish an effective tool (Reiman & Dotger, 2008). Innovation can have different definition depending on which area you are in. The technological innovation is defined as a new market and or a new service opportunity for a technological based invention which could lead to development, or production success (Reiman & Dotger, 2008). In order to maintain a competitive advantage in their respective industries, firms must develop and execute new or enhanced products, services, processes, and market strategies. This is referred to as "firm innovation," and it is a multifaceted notion (Palangkaraya et al., 2016). Various internal and external elements, including resources, skills, culture, networks, market conditions, technology breakthroughs, and regulatory rules, have an impact on a company's innovation efforts. To maintain their growth and profitability in the long run, businesses must consistently invest in innovation. Therefore, an important area of research in the fields of innovation management and economics is understanding the nature and drivers of corporate innovation (S. Kim et al., 2016).

Another way to define innovation is as a strategy and technology for developing new markets, new product strategies, and new customer demographics. By fusing their knowledge, businesses may address challenges through innovation (Varadarajan, 2018).

2.4.1.2. Importance and Effect of Innovation

In today's corporate environment, innovation has become essential to organizations. It not only increases competition but also gives businesses the ability to stay ahead. Companies in the modern day cannot rely on conventional business practices

(Allen & Henn, 2007). Businesses can innovate by creating new goods and services, using fresh business strategies, and investigating new market niches. Additionally, it gives businesses the chance to work with other industry participants to experience exponential growth. Without innovation, businesses may find it difficult to adapt to their consumers' changing needs, fall behind in technical development, and ultimately lose their competitive edge. Innovation is now crucial for businesses to survive and remain competitive (Ahlstrom, 2010). within the backdrop of the ongoing strains on contemporary institutions as they attempt to meet the demands of a difficult and unstable environment. Innovating is essential It fights to evolve and adapt in order to deal with rapidly changing markets and technologies in order to thrive. In the private sector, there is always a chance that new rivals will appear in the international markets. Either way, as governments work to balance demands that exceed their incomes with expenditures to raise living standards, there is still a desire in the public sector for efficiency and improved performance. All companies are encouraged to innovate because, if they can't, others can, and those new players could endanger the organization's existence. Simply put, firms must implement successful new ideas if they want to evolve, grow, and become more profitable, effective, and sustainable. It has too constantly been original. According to the economist, offers a tremendous reward « To put it clearly, the innovative Stick of acute poverty, as said by Joseph Schumpeter (Dodgson et al., 2002).

Innovation and problem-solving go hand in hand; it might be a fresh approach to a current issue or a brand-new fix for an old one. Innovative thinking involves approaching problems from different angles, taking use of fresh opportunities, or making better use of already available resources. Being a problem-solver by nature frequently results in innovation and fresh thinking (Huebner & Fichtel, 2015).

The main driver of a stable knowledge-based economy, which is now the cornerstone of competitiveness and dynamic development, is thought to be innovation activities. An economy must understand that innovation is the only means of surviving in the fast-paced business world and that systematic innovation, which will find its place in the market, can only be accomplished in partnership with scientific organizations.(Janjić & Raenović, 2019), In light of this, the most important topics in business management today are how to sustain and improve innovation as well as how innovation affects both financial and non-financial performance (Dagan et al., 2021) “Aside from that, Kimberly & Evanisko (1981) add specifies three additional ways that

the term can be used: innovation as a process, innovation as distinct things like products, initiatives, or services, and innovation as an organizational feature “ (Shin & Choi, 2019).

The introduction of a new or significantly improved product, service, process, marketing plan, or organizational method in business operations, workplace organization, or external relations is referred to as innovation. The introduction of a new or significantly improved product, service, process, marketing plan, or organizational method in business operations, workplace organization, or external relations is referred to as innovation. (Damanpour et al., 2018) .

Innovative activity is a multifaceted, complex process that has proved crucial to preserving global competitiveness. Restructuring, cost-cutting, and enhancing the quality of goods or services are no longer adequate for businesses pursuing excellence in this period of fierce competition. Determining how to preserve and improve innovation as well as how innovation affects both financial and non-financial performance are therefore the fundamental concerns in modern corporate management (Arenhardt et al., 2018).

2.4.1.3. Challenges (Barriers) for Implement Innovation

The obstacles to invention are significant. Many people find the transition unsettling. It is innovation-driven. Large-scale innovation, in particular, can have consequences. negative for workers, inspiring mistrust, dread, and annoyance. There are establishments. Social agreements that help its members grow in commitment, loyalty, and trust. Innovative ideas By shifting resources, altering the dynamics between groups, and establishing the dominance of one area of the organization at the expense of others, it violates this compact. It has the potential to overwhelm people's long-acquired, incredibly valuable technical and professional skills. Mean Its organizational framework can't be separated from the use of power and the opposition to it.(Dodgson et al., 2002). Focusing on the challenges, the author indicated The obstacles are one of the primary problems that arise when researching the innovation topic, which is very important to the management of top companies. Studying each barrier's history, makeup, and significance is therefore required. Additionally, it is necessary to consider each barrier's impact, outcomes, and implications on the innovation process. One of the most popular

categories for these barriers is the separation between internal and external barriers in terms of organizations, or endogenous exogenous constraints, or internal and exterior barriers with regard to organizations (Duarte et al., 2017) as well as the obstacles may show up at one or more points during the innovation process. Different levels of innovation implementation may result in a range of results in this process. For instance, financial challenges frequently increase the difficulty of the innovation's implementation phase (J. S. Kim & Chung, 2017).

The theory behind the approach to the problem of barriers is based on the notion that once they are discovered, the objective is to study them, oppose them, and, if possible, eliminate them in order to enable innovation to progress regularly(Tidd & Bessant, n.d.). Although these two ideas eventually come together, the truth is that neither of them adequately describes the nature of obstacles to innovation in terms of how they are exposed, how they can discourage, or the circumstances in which they can coexist with innovation. Most of the investigations that are currently available have a tendency to submit their data from a financial perspective, to the detriment of non-financial barriers, and they occasionally do not provide evidence for the barriers that include non-financial issues, such as marketing and expertise, which are significant in the context of innovation policies and management. This is because they prefer to submit their data from a financial perspective (D'Este et al., 2012).

Innovation is essential for businesses to maintain competitiveness and attain long-term success in the rapidly evolving world of today, also important to the success of innovation activities are internal and external elements including organizational structure, leadership, and open innovation networks, to create an innovative culture, encourage creativity, and continuously enhance their goods and services, businesses must regularly assess and modify their innovation strategy by embracing innovation, businesses can beat the competition, open up new markets, and ultimately succeed in the long run (Martinuzzi et al., 2018).

2.4.2. Firm Innovation Dimensions

The concept of "firm innovation" includes the two critical facets of "administrative innovation" and "technology innovation." These two parameters show

different but linked organizational innovation elements. Let's delve deeper into each dimension:

2.4.2.1. Administrative Innovation

Concept Of Administrative Innovation:

Organizational management has always included the area of administration significantly. Administrative innovation has become a crucial skill due to the growing necessity to reinvent organizational procedures to satisfy the demands of the always changing market and to maintain competitiveness. Creating novel techniques and procedures for administrative purposes enables the organizational process to increase productivity, quality, and efficiency. In order to provide pertinent theoretical views that can aid businesses in developing and implementing novel administrative practices, numerous research have examined administrative innovation (Rahmah et al., 2020) .

Feel that in today's dynamic business world, administrative innovation has become essential for companies to retain their growth and competitiveness. Administrative innovation is the use of novel practices and instruments that streamline administrative processes, reduce costs, raise efficiency, and increase output (Porter & Kramer, 2018). argues that administrative innovation is an essential ingredient for any company to achieve long-term success in the highly competitive business world(Kandampully, 2002).

Definition Of Administrative Innovation:

The administrative core is where administrative innovations are introduced and are often implemented. They deal with administrative procedures, human resources, and organizational structure (Damanpour et al., 2018).

Corporate innovation is important since it will contribute significantly to future growth and give the organization a competitive advantage. The key to creativity is coming up with novel or unique ideas that the market may use to launch new goods and services or improve existing ones (Štrukelj & Sternad Zabukovšek, 2019).

Companies need administrative innovation to adapt to shifting circumstances and find new opportunities. Innovative administrative techniques can save costs, boost

productivity, improve the standard of services, and increase organizational flexibility. Additionally, administrative innovation can boost innovation and employee engagement, improve the organization's reputation, and guarantee its long-term survival. As a result, businesses that adopt administrative innovation are more likely to maintain their competitiveness and experience long-term success (Leković et al., 2019).

In today's rapidly evolving business world, administrative innovation is crucial. Companies can streamline their operations and stay ahead of the competition by implementing innovative methods and technologies. Exploring innovative procedures, instruments, and systems for administration can increase output and efficiency. Businesses that don't innovate on an administrative level risk becoming irrelevant and stagnant (Kraiczy et al., 2015b).

By altering an organization's organizational structure and operational procedures, administrative innovation seeks to increase its capacity (H. Cho et al., 2019)

Damanpour et al. (2018)Expect that administrative innovation helps businesses achieve their objectives for new product development for a variety of reasons. To build a new environment and adjust to a changing market, such as by launching new goods or services, administrative innovation is first required, administrative innovation is the concept of implementing novel approaches, strategies, and tools in business management. Enhancing the effectiveness and efficiency of a company's administrative operations is the aim of administrative innovation. This kind of innovation is especially crucial in the fast-paced business world of today, where businesses must contend with intense competition and mounting demand to reduce costs and boost efficiency

A business is well-positioned to acquire a competitive edge, lower costs, and boost profitability if it can successfully apply administrative innovation. Additionally, administrative innovation is crucial for businesses to adjust to and keep up with the dynamic business environment. It was said by (Birkinshaw et al., 2008).

"Innovative management practices can bring significant benefits to organizations, including increased productivity, improved customer satisfaction, and enhanced financial performance."(Sull, 2009b).

Administrative innovation is a set of procedures, practices, and actions aimed at enhancing the organizational environment as a whole and stimulating creative

performance by encouraging staff to approach issues and make decisions in unique ways (Rahmah et al., 2020)

Product innovation, concentrating on how new products differ from existing products, as well as the degree to which new products differ from competitors' products, the percentage of new product sales out of total sales, and the organization's position with customers in relation to new products, all of which are dependent on the organization's position with customers in relation to new products (Roy ,2018).

Process innovation based on studies, focused on the level of introducing machinery, equipment, work practices, and new technologies required for product manufacturing (H. Wang et al., 2022).

Administrative innovations are those that have an administrative component and have an impact on the social structure of the organization. They are therefore more challenging to quantify in comparison to, say, product advances (Tanninen et al., 2008).

administrative innovation is essential to any business since it increases the efficacy and efficiency of the administrative systems. It enables firms to respond to stakeholder demands and the constantly shifting business environment. Organizations can improve their communication channels, streamline their operations, strengthen their capacity for decision-making, and increase their bottom line through administrative innovation. However, for administrative innovation to succeed, a supportive environment that encourages creativity, experimentation, and risk-taking is necessary. An organization's executives are crucial in fostering an innovative culture and supporting the adoption of new concepts. In order to advance the innovation agenda, businesses must invest in the development of innovative leaders (Yusr ,2016).

Administrative innovation's difficulties:

- Employee Reticence to Change: If employees believe that new administrative methods pose a threat to their job security or daily routines, they may be reluctant to accept them.
- Resource Restrictions: Starting out with initial investments in technology, training, and process reform is frequently necessary for implementing administrative innovation.

- Organizations must strike a balance between preserving stability and seeking innovation in order to prevent upsetting crucial operations(De Francesco, 2010).

2.4.3. Technological Innovation

2.4.3.1. Concept of technological innovation

Establishes the groundwork for any research undertaking, and it is essential. It describes the scope and technique used to accomplish those goals, as well as the study's history, motivation, and objectives. Economic growth and industry transformation in many sectors have been fueled by technological innovation. Technology is becoming more accessible as it develops, which has sparked a new wave of innovation in the business world. Several earlier studies have empirically investigated this relationship between technology innovation and firm innovation (Aerts & Crispeels, 2022).

B. Wang et al. (2016) recommend that businesses should collaborate with their suppliers to get the most of their technology resources. Alliance partners are frequently the most significant source of fresh concepts and knowledge that lead to technological advancements and performance improvements.

The process of developing and integrating new or enhanced technologies into products, services, processes, or business models that increase the value of the offerings to customers and stakeholders is known as technological innovation. To create innovative concepts, designs, prototypes, and commercial solutions that help firms compete more successfully in the global marketplace, it entails applying scientific knowledge, resources, and investments (Dmitriev et al., 2014).

Technological innovations are considered to arise in the technological cores of companies and relate to goods and services as well as production procedures and operations that are connected to the organization's core activities (Saaksjarvi, 2003). According to (Yang et al., 2012) company's lifeblood is technological innovation. That's because technology keeps businesses one step ahead of their rivals by accelerating innovation, raising productivity, and cutting expenses,deep learning-based research on technological innovation enterprises' performance prediction. Mobile computing and wireless communications.

According to Bazan.(2019) technological innovation comprises a range of activities, including research and development, invention, engineering, testing, implementation, and diffusion of innovations. It can lead to significant improvements in productivity, quality, efficiency, speed, customization, and cost reduction, and can enhance the firm's ability to respond to changing market dynamics, customer needs, and regulatory constraints. By embracing technological innovation, organizations can generate new revenue streams, reduce operational risks, optimize resource utilization, and sustain long-term economic growth.

2.4.3.2. Definitions of Technology Innovation

Since there were numerous definitions of this idea that were all substantively equivalent, we shall award them as follows:

Differentiate incremental (exploitative) and radical innovation based on the level of "radicality" Additionally, it is common to divide innovations into technological and non-technological categories (Rahmah et al., 2020). In other words, the dissemination of fresh technical knowledge regarding a new or improved technique of conducting business, for instance, there may be a connection between technological innovation and the production process, operational procedures, or goods and services of a company. Technology-enhanced creation of new items, services, and processes, as well as the introduction of new technical knowledge, are both seen as instances of technological innovation. (Smajlović et al., 2019).

Technology is defined as "theoretical and applied knowledge, skills, and artifacts that can be applied to the development of products and services, as well as their production and delivery systems."(Hadjimanolis, 1997). In order to advance technology, new concepts must be developed and implemented in order to improve operations, the production process, goods, and services (Damanpour et al., 2018).

2.4.3.3. Importance of Technological Innovation

Increasing global competitiveness, shortening product lifecycles, increasing technological capability, and ever-changing customer preferences force firms to innovate Innovative activities are usually perceived as a valuable capability of an

organization, because they are needed to develop new business models, products and procedures, crucial to achieving sustainable competitive advantage (Omri, 2020).

The establishment and development of new enterprises and industries, as well as the expansion and survival of current firms and industries, have all been impacted by technological innovation. This broad variety of consequences has attracted more attention and discussion. claimed that the development of value for a company should be the major goal of technology management. The ability of a company to develop competitive advantages in the market, or more specifically in its competitive domains, is linked to value creation (Erturk, 2014).

2.4.3.4. Classification of Technological Innovation

Numerous categories have been used to categorize technological advancement. The division of innovations into product and process innovations is the most popular. While process innovations "involve the machinery, procedures, and systems used in the production of the goods," The term "product innovations" refers to newly released goods that are intended to fill a market or user need. The distinction between gradual (or ordinary) and radical (new, essential, or fundamental) improvements is another crucial typology. The latter refer to breakthroughs that have a significant economic impact and frequently disrupt existing sectors while also creating new ones. such elementary innovations "(Hadjimanolis, 1997). In other words, (Smajlović et al., 2019) classified technological innovation as Link the development and use of new technologies to product and process innovation, and categorize them as technical innovations.

2.4.3.5. Product Technical Innovation

It is possible to define product technical innovation as "instigating changes in product specifications and characteristics, in order to meet some desires and satisfy some needs in a better way, and aims to display products in the market."(Kok & Biemans, 2009).

It is distinguished by innovation in terms of the goods on the market Innovation can be found in both the functions a product performs and the circumstances under which it is used. Also known as: Introducing new or strengthened goods or services, obtaining

the appropriate markets for them, and demonstrating their commercial viability. Another way to describe it is as follows It is the institution's production or introduction of a new product to the market that is distinct from existing products in terms of its characteristics, components, and ease of consumption for the consumer (Varadarajan & Kaul, 2018).

product's technological innovation occurs throughout its production and marketing since doing so enables the product to acquire new and improved features and showcase them to the consumer. This innovation also makes use of novel components, alternative raw materials, and design principles. As a result, the three parts of the product's technological innovation are as follows: Innovating the functional composition of the product, such as by coming up with a new formula or drastically altering the existing one. enhancing the product's technological maquillage and connecting it to its technical features. creating the components or qualities that the product is represented by in the form in which it is presented(Kline & Rosenberg, 2010).

2.4.3.6. Process Technological Innovation

It can be stated as follows: Every modification or renewal of production techniques attempts to lower production costs and enhance the technical method's performance, which leads to favorable outcomes in terms of profitability, output volume, and lower cost per unit produced. It is described as: it is the adoption of new methods for the product as well as the exploitation and development of processes or procedures in the industry. Also included in the definition is the phrase "changing the method of production to a new method that was not before or changing the method of providing services or delivering products."

We deduce from it that the technological innovation of the process is the innovation that aims to enhance the technical and financial performance of the production process, whether by investing in new technology that is based on contemporary methods of production and mastering the use of existing tools, while integrating expertise and conducting training courses like streamlining production models and deepening technical knowledge. and enhancing individual performance A change in the products may need a change in the way they are produced since the relationship between technical innovation in the process and that of the product is intertwined.(Forrest, 1991).

technological innovation plays a significant role in fostering firm innovation. Furthermore, firms that leverage technological advancements tend to enjoy competitive advantages and increased profitability compared to firms that fail to adopt new technologies. The study of overall innovation includes technological innovation. It especially focuses on technology and how to properly incorporate it into products, services, and operations. Therefore, it is possible to think of technology as a body knowledge that serves as the foundation for research, design, development, manufacturing, and marketing (Gui et al., 2024).

3. RESEARCH METHODOLOGY

3.1. Introduction

This chapter explains the methodology used to achieve the research; objectives of this chapter is to gives a full description of the research methodology used in carrying out this research. The previous chapter provided a full demonstration of the main concepts that this research mainly focuses on, such as top management team behavioral, strategic agility, firm innovation.

The main parts of this chapter are research design, research hypotheses, sample selection, data collection procedures and data analysis. The research adopted descriptive analytical method in the study of the three variables of research using the applied method and field research, with the use of several methods and statistical treatments related to the research subject

3.2. Methodology of the Field Study and Its Procedures

3.2.1. Research Design

A methodical technique to examining phenomena through the collection and analysis of numerical data is known as quantitative research. It is a well-defined methodology that places a strong emphasis on objectivity and the application of statistical methods to make inferences.

By using particular methodologies and procedures, research design in quantitative studies aims to provide a systematic and controlled approach to data collection. By identifying the research objectives, choosing suitable samples, creating the data collection tools, and deciding on the data analysis methods, it ensures the validity and reliability of the study. An effective research design enables researchers to produce accurate and objective results, advancing scientific understanding (Apuke, 2017).

An exhaustive description and analysis of a certain event or topic are the goals of a descriptive-analytical study, which is a type of research methodology. For the purpose of providing a thorough understanding of the topic under investigation, this sort

of study entails gathering information from a variety of sources, including surveys, observations, and interviews. A descriptive-analytical study's main objective is to give a complete analysis of the data gathered, enabling researchers to come to relevant conclusions and take appropriate action (Loeb et al., 2017).

This study adopted a descriptive-analytical study serves as a framework through which researchers evaluate and interpret data in order to more fully comprehend a particular occurrence in the large terrain of research technique. The nature of the current study with its variables and dimensions necessitates resorting to the use of two approaches that complement each other in order to achieve the goals and test hypotheses, which are descriptive and analytical.

The descriptive approach refers to a description of all the variables of the study and the theoretical review of the topics that were mentioned through it, as well as the most important responses of other researchers on the relevant topic by referring to the most important sources such as a verity numbers of books, doctoral and master's theses related to the research title and its variables and its dimensions and field of application, scientific and academic research in reliable scientific journals. As for the analytical approach, in light of it, in order to clarify the degree of the relationship and influence between the variables and the dimensions, it is possible to achieve the practical test of the information and knowledge of the study's variables and topics, analyze them, and then arrive at results that demonstrate the degree to which the assumptions about the existence of a logical connection between those variables are true. and the in this study used the questionnaire survey as a tool to collect data and information related to its variables.

3.2.2. The Variables and its Dimensions

- The first variable: the Independent Variable (Top Management Team Behavioral) that was measured in the light of a scale that includes three sub-dimensions (1. Participative Behavior 2. Information Exchange 3. Participation in Decision- Making).

- The second variable: the Mediating variables (Strategic Agility) that was measured in the light of a scale that includes three sub-dimensions (1. Strategic Sensitivity 2. Leadership Unity 3. Resource Fluidity).
- The third variable: the Dependent Variable (Firm Innovation), which was measured in the light of a scale that includes tow sub-dimensions (1. Administrative innovation 2. Technological innovation).

Thus, the researcher resorted to encoding the measures (variables, sub-dimensions, and their measurement paragraphs) to facilitate the task of reading and dealing with them in the use of statistical analysis methods.

3.2.3. Research Questions

To fill in knowledge gaps, look into connections, or comprehend phenomena. The design of the study is influenced by the research questions, which also assist researchers concentrate their efforts on gathering and analyzing pertinent data. This study's problem statement can be summarized in the form of the following questions:

- Can the top management team behavioral contribute to improving the firm innovation through strategic agility?
- What is the level of the top management team behavioral of the firms' boards of directors in the study sample in the field of information exchange, cooperation, and participatory decision-making?
- Were the study sample firms able to achieve firm innovation? Which activities has attracted the attention of the boards of the top management team of companies more than others? do these companies differ in their innovation?
- To what extent do the study sample firms possess the strategic agility that enables them to deal with Changes taking place in their external environment, whether by way of strategic sensitivity, leadership unity, and resource fluidity. Did these firms differ in their level of strategic agility?
- Can strategic agility mediate the relationship between the level of the top management team behavioral of Iraq's oil firms and the level of firm innovation?

3.3. Research Population and Sample

The target population for this study is the oil sector, specifically the companies working in oil fields, the oil industry has played a significant role in the economic development of Erbil, Kurdistan region. has experienced substantial economic growth in large part to the oil industry. firms engaged in the exploration, production, refining, and distribution of crude oil and its byproducts are referred to as oil firms. These businesses are essential to the economy because they extract and refine oil, a significant source of energy and a vital component of many different sectors. Oil businesses have a long history in the Kurdistan region - Erbil, with their operations going back many years. Understanding these companies' definitions and functions is crucial to understanding how they affect the economy and development of the area.

There are three main groups of companies, a research sample, randomly selected according to the specializations in which they work, and the questionnaire was distributed randomly to collect a data. It should be noted that the process in the field of oil begins with certain steps and the most important specializations are the companies in the field of oil that were chosen as follow:

3.3.1. Description of the Specializations of the Research Sample Companies

Group one: exploration and geological survey companies Oil extraction

Oil company operations and success depend heavily on exploration, which is a fundamental idea in this industry. The methodical process of looking for and finding new oil and gas reserves can be summed up by the term. Geological surveys, exploratory well drilling, and data analysis are all required to locate possible oil and gas resources in unexplored regions. It is impossible to overstate the importance of exploration for oil firms because it has a direct bearing on their capacity to find new reserves, boost output, and maintain ongoing operations. Oil businesses can increase their resource base through exploration, reduce the risk of depleting their existing reserves, and adjust to shifting market conditions. We may further investigate its function and assess its effects on the long-term growth and profitability of these businesses by comprehending the idea of exploration and its significance within the framework of oil firms.

Group tow: oil distribution companies

The act of moving crude oil and its refined products from the locations of production to final consumers constitutes distribution, which is a crucial part of how oil companies conduct their business. Distribution in the context of oil firms entails a complicated web of tasks, such as marketing, storage, and transportation. The effective and secure delivery of oil and its derivatives to diverse markets is made possible by transportation. Storage facilities are essential to the distribution process because they act as a buffer between production and consumption, enabling the oil industry to modify supply in response to market demand. Additionally, marketing initiatives are crucial in promoting and selling oil goods to customers, making distribution both a tactical and physical operation. In essence, distribution in the context of oil firms refers to a variety of actions taken to supply oil and its derivatives to consumers in an effective manner.

Group three: companies of oil sales and logistics services

The firms that provide logistics and oil sales services are essential to the world's oil industry. These businesses are experts in the buying, selling, and distribution of oil and its byproducts to diverse clients and marketplaces. Understanding market demands, negotiating contracts, and managing sales of crude oil, refined petroleum products, and natural gas are all part of the oil sales component. The logistics services component, on the other hand, is concerned with the effective delivery, storage, and transportation of these oil products. This entails organizing the flow of products between various geographic areas and markets as well as managing tangible assets like pipelines, storage tanks, and shipping vessels. To fulfill the energy needs of people, businesses, and nations all over the world, the enterprises in this industry are tasked with ensuring a smooth and flawless supply chain operation.

3.3.2. The Structure in the Oil Companies

The size, operational nature, and corporate culture of an oil firm will all influence the organizational structure, as they will in any other place. However, one of the following organizational models is frequently used by most oil companies:

Oil firms are organized according to specific functions or divisions, such as exploration, production, refining, marketing, finance, and human resources, in a

functional structure. Employees are subject to the functional managers of their respective departments, each of which is in charge of its own specialty area. Specialization and resource exploitation are made possible by this structure, although coordination and communication across different functional areas may face difficulties, and the second most used Oil firms are divided into divisions according to geographical areas, product categories, or client segments in a divisional structure. In order to support its unique operations, each division has its own functional departments that work as a semi-autonomous unit. This organizational structure allows for a sharper focus on regional or specialized demands, yet it may lead to function duplication among divisions, third part Oil businesses organize their activities around particular projects or contracts when using a project-based structure. Resources are allocated to projects as needed, and each project is handled as a distinct entity with its own project team. Although this structure encourages flexibility and adaptation to project objectives, it may lead to resource limitations and difficulties managing numerous projects at once.

It's crucial to keep in mind that the particular organizational structure of oil businesses in Erbil might change depending on elements like the company's size, operational range (exploration, production, services, etc.), and corporate strategy. Additionally, if a firm expands, diversifies its operations, or adapts to market dynamics and industry developments, the organizational structure of oil corporations may change over time, Accordingly, the sample was chosen very carefully and based on the organizational structure of the companies, and also with the help of my opinion of the foreign experts who work for them.

3.3.3. Descriptive of Study Sample and Sample Size

The research community included of the top management teams in the oil companies in Erbil, who were randomly selected from experts, consultants, advisors, general directors and assistant directors, which they playing critical roles in there companies and affects the direction and successful and strategic future , According to (Lohrke et al., 2004)The top management teams of firms are now essential to the success of organizations in today's increasingly complicated and competitive business climate. These teams, which are made up of top executives in important decision-making roles, are important for fostering strategic vision, establishing corporate objectives, and

guaranteeing the rapid and successful execution of company initiatives. Organizational strategy formulation and implementation is a crucial task for top management teams. These teams create thorough strategic plans that outline the direction of the company's future development and performance by meticulous examination of market trends, industry dynamics, and internal capabilities.

For this reason, the researcher targeted the top management teams in their companies for their role and importance in resolving the objectives and hypotheses of the research by answering the survey questions.

The searcher chooses 20 companies as a sample and should be noted that there is proximity 400 individuals work as top management teams as a population that suitable for answer the questions which was chosen by researcher. To do this study (216) forms of the questionnaire answered and was suitable for analyze.

3.3.4. Descriptive the Study Sample Demographically

Demographic and professional information of the research community: The statistical analysis of the demographic information of the research community was carried out through the statistical program to identify.

On the demographic distribution and the percentage of each characteristic (Gender, age, academic qualification, job position, job duration), the researcher conducted the analysis at the level of (216) observations of top management teams in the companies surveyed. shows the results as follows:

3.3.4.1. Gender Analysis

Table 3.1. gives information related to the gender of respondents The total number of respondents was 216 employees. Based on that information 73.1% of respondents are male and 26.9 % of respondent’s female. This is because of various factors, the most significant of which may be that women have significant family duties, which may be a hindrance.

Table 1: Gender

		Frequency	Percent
Valid	Male	158	73.1
	Female	58	26.9
	Total	216	100.0

3.3.4.2. Age Analysis

The age group (41-60) represents the largest percentage of the research community, as it reached (43.05%), while the second and third percentages, respectively, and they represent the age groups (31-40 years), the percentage of (%37.5), and (25-30) years, the percentage (%19.4) respectively, It is noted from this the diversity of the age groups of the members of the research community, as the ratios indicate the presence of an element of experience with the element of the youth category, and this indicates a good combination of the diversity of ideas as show in the table (3.2).

Table 2: Age

		Frequency	Percent
Vvalid	25 - 30 years	42	19.4
	31- 40 years	81	37.5
	41-60years	93	43.0
	Total	216	100.0

3.3.4.3. Educations

Table 3.3 Releases information about education level of respondents, nearly half of the participants had Post graduate degree. Their number 62.0%, Bachelor degree holders 34.7%, The other groups were technical diploma with 3.2% and secondary degree or lower.

Table 3: Educations

		Frequency	Percent
Valid	**Technical Diploma**	7	3.2
	Bachelor	75	34.7
	Postgraduate	134	62.0
	Total	216	100.0

3.3.4.4. Position

Table 3.4. explained information's about position level of respondents 20.4% assistant director 30.6% general director, consultant 26.9%, advisor 22.2%.

Table 4: Position

		Frequency	Percent
Valid	**Assistant Director**	44	20.4
	General director	66	30.6
	Consultant	58	26.9
	Advisor	48	22.2
	Total	216	100.0

3.3.4.5. Service Duration

Table 3.5. give information about service duration of respondent's service duration were considered and divided to two groups. The first group was for those employees who had less than 15 years of service 46.3 % The number for the first group was much higher, The second group and 53.7%.for 15 years or more.

Table 5: Service duration

		Frequency	Percent
Valid	**Less than 15 years**	100	46.3
	15 years or more	116	53.7
	Total	216	100.0

3.4. Research Instrument and Source of Data Collection

The research tools for this study are questionnaire survey in order to collect quantitative data from the sample of the study, depending on the survey's design and intended audience, several data sources may be used in survey research. According to (Hox & Boeije, 2005) Primary Data Collection is essential to study. For a specific research study, this entails gathering original data directly from people or organizations.

The questionnaire is a popular research instrument that enables researchers to get information from people and collect data. Its goal is to meticulously compile data from respondents in order to discover insights, recognize trends, and make judgments. An

organized series of questions known as a questionnaire is used to assess a target population's attitudes, opinions, actions, and other traits. A set of prepared response possibilities are often provided to respondents in closed-ended inquiries, which are the norm (Malhotra, 2006).

In this survey research, the main data collection techniques are questionnaires to gather information from respondents for surveys, questionnaires with a list of structured questions are frequently used. These questionnaires distributed in a variety two way, including surveys that are printed on paper, and internet surveys, the questionnaire depended on Likert scale with five points (1. Strongly Disagree 2. Disagree, 3. Neither Agree nor Disagree, 4. Agree, and 5. Strongly Agree).

The Likert scale, which asks respondents to rank their level of agreement or disagreement with a statement on a five-point scale, is one style of closed-ended question that is frequently employed. The advantage of the Likert scale is that it enables statistical comparison and measurable data analysis. It does, however, have some drawbacks, such as the potential for response bias and the constrained diversity of responses. To use the questionnaire and Likert scale as a research tool effectively, researchers must be aware of their goals and constraints.(Joshi et al., 2015)

The research sample was selected, which included 216 individuals from different administrative levels from the top management team. These individuals hold senior positions in their companies, such as (Assistant Director, general director, consultant, advisor)

The questionnaire was prepared by the researcher in order to obtain the required information for the purpose of achieving the research objectives. In order to prepare the questionnaire, previous researches which was applied before depended, the questionnaire were relied upon as follows:

The first part: Demographic part which contains (Gender, age, academic qualification, job position, job duration) depended on the master thesis applied in oil sector in Erbil city in 2017 (Ahmed, n.d.)

The second part: included independent variable the behavioral of the top management team with its three dimensions contain of (9) parts (Participatory

behavior(3questions), information exchange(3questions) participation in decision-making(3questions) (as its paragraphs were formulated based on a study) (Najah, 2014).

The third part: included mediating variable the strategic agility with its three dimensions contains of (9) parts (strategic sensitivity(3questions), leadership unity(3questions), resource fluidity (3questions) (as its paragraphs were formulated by researcher based on a study) (Reed, 2020).

The fourth part: included dependent variable firm innovation with its tow dimensions contain of (6) parts (administrative innovation (3questions), technological innovation (3 questions) (as its paragraphs were formulated by researcher based on a study) (Abdel Wahab, B. (2012).

3.5. Reliability Test

3.5.1. Cronbach's Alpha

In order to determine relatability of the parts and variable of the study researcher depended on Cronbach alpha: according to (Taber, 2018) To ascertain if the components within a dimension may be merged into a single composite score, researchers use Cronbach's Alpha. The components are highly connected and can be consistently merged if the Alpha value is high (for example, above 0.7 or 0.8). The scale may need to be further refined if the Alpha value is low, on the other hand, as this indicates that the items may not be consistently measuring the same construct, explain the Table 3.6 explain Cronbach's Alpha reliability for the internal Consistency.

The values of the Cronbach alpha coefficient for the main research variables and their sub-dimensions ranged between (0.920- 0.950). These values are considered acceptable in descriptive studies as they are high values compared to the standard Cronbach alpha values of (0.70). And as shown in Table (3-6). This confirms the consistency between the components of the scale and thus the stability of the required in the event of repeating the test.

Table 6: explain Cronbach's Alpha reliability for the internal Consistency.

Variables	Cronbach's Alpha(a)	N. Of Items
Top Management Team Behavioral (TMTB)	0.950	9
Strategic Agility (STA)	0.945	9
Firm Innovation (FIN)	0.920	6
Total		24

Table 3.7 shows that the reliability for all variables is 0.922 that mean that the Consistency of all Variables very high Here it is noted that the values of honesty were excellent and high within the sample answers, and thus the study tool and its standards became valid for the final application, as they are characterized by accuracy, stability, and high honesty.

Table 7: Cronbach's Alpha reliability for all Variables

N. Of Ítems	N. Of Case	Cronbach Alpha(a)
24	216	0.922

As show in the table (3.8) The values of Cronbach's alpha coefficient for the study's main variables and its sub-dimensions ranged between (0 .896 - 0.841). These values are acceptable, reliable, and have an excellent level of stability in descriptive studies, being high values compared to the standard Cronbach's alpha values. also noted that the values of the structural validity coefficient were excellent and high. Within the sample answers, and thus the study tool and its standards became valid for final application, as they are characterized by accuracy, stability, and high validity.

Table 8: Cronbach's Alpha Reliability for The Internal Consistency of Dimensions

Dimension	Cronbach's Alpha(a)	N. Of Items
1.Participative Behavior	.862	3
2 Information Exchange	.864	3
3. Participation in Decision- Making	.896	3
1.Strategic Sensitivity	.894	3
2.Leadership Unity	.842	3
3.Resource Fluidity	.869	3
1. Administrative innovation	.841	3
2. Technological innovation.	.861	3

Total	24

Researchers can confirm that their scales are valid and trustworthy for measuring the intended constructs by looking at the internal consistency of the dimensions using Cronbach's Alpha. This enables more accurate and robust data processing and interpretation.

3.6. Data Analysis

For field researchers to reach meaningful findings and comprehend the intricate dynamics of the study area, the process of data collection and analysis is essential. Data must be categorized and meticulously evaluated in order to spot patterns and trends once it has been collected using a variety of techniques, including surveys, questionnaires the statistical techniques used to analyze the data divided into four groups, as follows:

After collecting data, the researcher started to analyze the data. The step of data analysis done through statistical program.

The primary way by which it is possible to establish the truth of hypotheses through the results of statistical analysis and processing tools is the selection of appropriate statistical tools for data analysis and processing and hypothesis testing and various analytical methods, as well as follow:

3.6.1. The Tools for Test Reliability and Validity Are as Follows

- Cronbach's Alpha to measure the internal consistency.
- Confirmative factor analysis (CFA): to confirm the structural validity of the scales and ensure their Suitability for their theoretical premises.
- Exploratory Factor Analysis (EFA) Test: to determine relationships (between observed variables and factors).
- Bartlett's test, also known as Bartlett's test of homogeneity of variances, is a statistical test used to assess whether the variances of multiple groups or samples are equal.
- The Kaiser-Mayer-Olkin (KMO) measure is a statistical test used in factor analysis to assess the adequacy of the sample for performing the analysis.

- Stability coefficient: to verify the stability of the scales and their accuracy in measuring variables in the field without complication or interference.
- Internal consistency coefficient: to verify the extent of harmony and consistency between the paragraphs and the dimensions they represent.

3.6.2. Descriptive Statistical Tools, as Follows

- Percentages: for the purpose of determining the percentage of agreement answers on the main and sub-research variables, which represent the result of dividing the partial value by the total value multiplied by 100.
- Arithmetic Mean: to determine the level of response to the paragraphs and to know the level of the variables in the field.
- Standard Deviation: To find out the level of dispersion of the sample's answers from the arithmetic mean.
- Coefficient of difference: It is one of the measures of dispersion, as it is used to compare the degrees of dispersion of two or more groups of values from their arithmetic mean, and in the form of a percentage that facilitates the possibility of comparison because it is not defined by certain units of measurement and is extracted by calculating the percentage of the product of dividing the standard deviation by the arithmetic mean.

3.6.3. Analytical Statistical Tools Including the Following

- Pearson correlation coefficient: It is used to determine the strength and type of effect between two variables. It is a direct positive, an inverse negative, or zero, and its value ranges between (1+) (1-) and is expressed mathematically according to the law.
- Path Analysis: It is used to determine the level of indirect influence relationships between research variables.

3.7. Limitation and Difficulties

An organized framework to direct the research process is provided by research methodology, which acts as a road map for researchers. It makes sure that research projects are carried out methodically, ethically, and rigorously, resulting in reliable and valid findings that enhance knowledge in a variety of domains.

There are difficulties and limitations that the researcher encountered while doing this research in the data collection stage.

- The geographical location of the oil companies and the very strict security restrictions, which necessitated obtaining approval for the purpose of distributing the questionnaire in order to take information from the selected household.
- The selected sample was from the top management team in the companies, the research sample, which includes, and because of the assumption of several positions by part of the selected sample, it was difficult to obtain information in a timely manner.
- Among the difficulties is that most of the experts who work in the field of oil are foreigners, and this constituted another obstacle.

4. DATA ANALYSIS

4.1. Introduction

Structural procedures are an urgent necessity to verify the reliability of the research standards at the level of the application environment. Thus, this part includes some necessary tests for testing the measurement tool in order to ensure its ability to measure and its suitability for the reality of the oil companies in Erbil sample test. Coding and characterizing the study scales, Exploratory factor analysis (EFA), Confirmatory Factor Analysis (CFA) Test, test validity and test of stability and internal consistency, as follows:

4.2. Coding and Characterizing the Study Scales

The study includes three main variables:

- The first variable: the Independent Variable (Top Management Team Behavioral) that was measured in the light of a scale that includes three sub-dimensions (1. Participative Behavior 2. Information Exchange 3. Participation in Decision- Making).
- The second variable: the Mediating variables (Strategic Agility) that was measured in the light of a scale that includes three sub-dimensions (1. Strategic Sensitivity 2. Leadership Unity 3. Resource Fluidity).
- The third variable: the Dependent Variable (Firm Innovation), which was measured in the light of a scale that includes tow sub-dimensions (1. Administrative innovation 2. Technological innovation).

Thus, the researcher resorted to encoding the measures (variables, sub-dimensions, and their measurement paragraphs) to facilitate the task of reading and dealing with them in the use of statistical analysis methods as show in table (4.1).

Table 9: Coding and characterization of the study measures

Sequence	Variables	Sub- Dimensions	Symbol	N. of items
1	**Top Management Team Behavioral (TMTB)**	1. Participative Behavior	PB	3
		2. Information Exchange	INFE	3
		3. Participation in Decision- Making	PINDM	3
2	**Strategic Agility (STA)**	1.Strategic Sensitivity	STS	3
		2.Leadership Unity	LU	3
		3.Resource Fluidity	RF	3
3	**Firm Innovation (FIN)**	1. Administrative innovation	ADIN	3
		2. Technological innovation.	TEIN	3

4.3. Exploratory Factor Analysis (EFA) Test

- The exploratory factor analysis mainly aims to represent the information available among a large number of paragraphs associated with a smaller number of factors or components, meaning a greater reduction of paragraphs to group them on a few key dimensions without losing a large amount of information organized in the original paragraphs (Stevens, 2012).
- Measurement of concordance of the sample as a whole is obtained using both Bartlett's tests And the Kaiser-Mayer-Olkin (KMO) index, which should not be less than (0.5) according to the (KMO) test.
- Eigenvalue: The sum of the squares of the saturations of all the variables on each factor of the matrix separately, and it represents the amount of variance that the factor contributes to, and it is specified as shown in the program by the value of one, which is according to the Kaiser criterion, so that if the potential root is greater than one, we accept the factor, and if it is less, we reject it.
- And determine the significance of the test by relying on the significance of the (chi-square value).
- Factor Loading: Correlation coefficient or covariance between the variable or statement and the factor or component and should be more than (30%) to be a significant and approved function within the behavioral and social studies.

In order to adopt the development of building standards at the level of the measurement paragraphs for each dimension and in consideration of the observations and modifications made by the arbitrators that support the development of standards, the researcher will use this method within the context of the current study at the level of the three variables as follows:

4.3.1. Exploratory Factor Analysis of Top Management Team Behavioral Variable

This scale includes (9) paragraphs divided into three main dimensions. The extent of its validity is tested in measuring the variable of the top management team behavioral, as it is clear from the table (4-2) that the suitability of the number of sample members has reached (0.947) It is a statistical value (KMO), which is greater than (0.50), that is an acceptable value, which indicates that the sample is suitable for conducting factor analysis.

The degree of correlations between the scale's elements can be confirmed by the use of the (Bartlett's test) scale, as it is clear that the significance level of the (Chi-Square) value has reached (0.000), which is less than (0.05), This shows the correlation matrix Since it is not a unit matrix, the relationships between the scale's elements play a crucial role.

Table 10: Statistical value (KMO) and (Bartlett's) test of the top management team behavioral scale

KMO and Bartlett's Test[a]		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.947
Bartlett's Test of Sphericity	Approx. Chi-Square	1631.172
	df	36
	Sig.	.000

In terms of the major component analysis, it aids in figuring out how many fundamental factors (components) are used to split the scale's paragraphs, The (Eigenvalue), which were identified in the analysis by more than one correct one, the percentage of variance and the cumulative percentage of the explained variance, which must be more than (60%) for the main variable, that is, for the factors combined.

It is evident from table (4.3) that the analysis of the primary components chose three main variables to describe the fundamental aspects of the top management team's conduct, under which the scale-related paragraphs are grouped. Its (Eigenvalue) were more than one true, the cumulative percentage of the variance explained by the three factors (71.628) It exceeds the prescribed ratio of (0.60) indicating that there is statistical significance for the scale.

Table 11: The total explained variance of top management team behavioral

Total Variance Explained						
Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.447	71.628	71.628	6.447	71.628	71.628
2	.522	5.803	77.431	.522	5.803	77.431
3	.421	4.673	82.104	.421	4.673	82.104
4	.361	4.015	86.120	.361	4.015	86.120
5	.325	3.616	89.735	.325	3.616	89.735
6	.290	3.221	92.957	.290	3.221	92.957
7	.255	2.834	95.791	.255	2.834	95.791
8	.190	2.108	97.898	.190	2.108	97.898
9	.189	2.102	100.000	.189	2.102	100.000

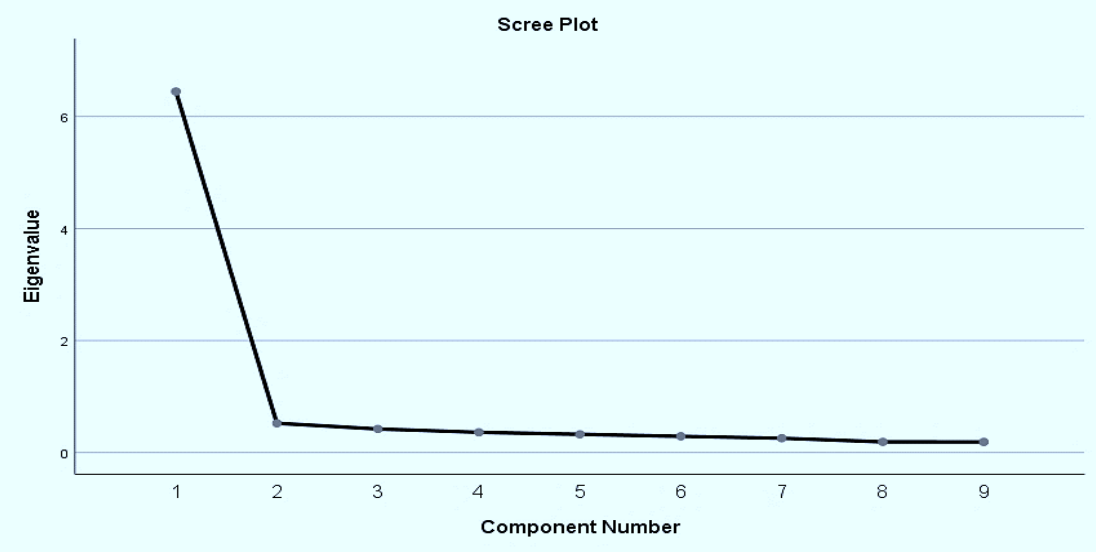

Figure 3: Cumulus map of the underlying roots

Figure 4.1 Shows the cumulus map of the potential roots, which represents the graph in which the value of the potential roots of the scale paragraphs (vertical axis) and the number of paragraphs (horizontal axis) is evident.

Table 12: saturation ratios for the top management team behavioral scale paragraphs

Dimensions	Component		
	1	2	3
Participative Behavior	.776		
Participative Behavior	.850		
Participative Behavior	.867		
Information Exchange		.835	
Information Exchange		.834	
Information Exchange		.868	
Participation in Decision- Making			.856
Participation in Decision- Making			.895
Participation in Decision- Making			.831

4.3.2. Exploratory Factor Analysis of Strategic Agility Variable

This scale includes (9) paragraphs divided into three main dimensions. The extent of its validity is tested in measuring the variable of the Strategic Agility, as it is clear from the table (4.5) that the suitability of the number of sample members has (0.919) It is a statistical value (KMO), which is greater than (0.50), that is, it is an acceptable value, which indicates that the sample is suitable for conducting factor analysis. As for the extent to which there are correlations between the items of the scale, this can be verified through the (Bartlett's test) scale, as it is clear that the significance level of the (Chi-Square) value has reached (0.000), which is less than (0.05), which indicates that the correlation matrix It is not a unit matrix, which makes the relationships between the items of the scale a significant function

Table 13: Statistical value (KMO) and (Bartlett's) test of the strategic agility scale

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.919
Bartlett's Test of Sphericity	Approx. Chi-Square	1569.852
	df	36
	Sig.	.000

In terms of the major component analysis, it aids in figuring out how many fundamental factors (components) are used to split the scale's paragraphs, The (Eigenvalue), which were identified in the analysis by more than one correct one, the percentage of variance and the cumulative percentage of the explained variance, which must be more than (60%) for the main variable, that is, for the factors combined.

It is evident from the table (4.6) that the analysis of the primary components chose three main variables to describe the fundamental aspects of the senior management team's conduct, under which the scale-related paragraphs are grouped. Its (Eigenvalue) were more than one true, the cumulative percentage of the variance explained by the three factors (69.404) It exceeds the prescribed ratio of (0.60) indicating that there is statistical significance for the scale.

Table 14: The total variance that explained by the strategic agility scale

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.246	69.404	69.404	6.246	69.404	69.404
2	.598	6.639	76.044	.598	6.639	76.044
3	.458	5.091	81.134	.458	5.091	81.134
4	.449	4.989	86.123	.449	4.989	86.123
5	.339	3.766	89.889	.339	3.766	89.889
6	.286	3.177	93.066	.286	3.177	93.066
7	.267	2.966	96.032	.267	2.966	96.032
8	.225	2.499	98.531	.225	2.499	98.531
9	.132	1.469	100.000	.132	1.469	100.000

Figure 4.2 Shows the cumulative map of the potential roots, which represents the graph in which the value of the potential roots of the scale paragraphs (vertical axis) and the number of paragraphs (horizontal axis) is evident.

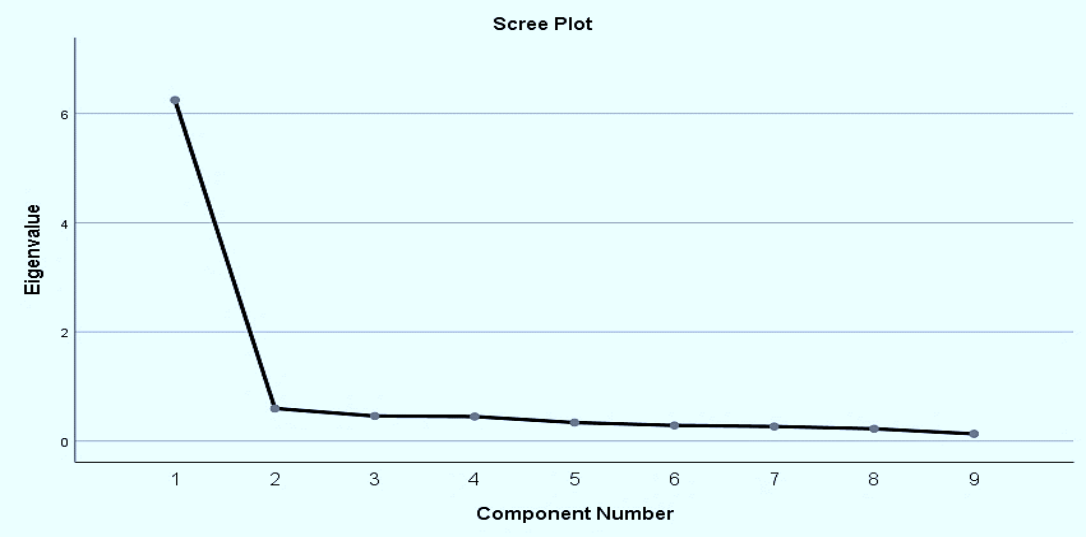

Figure 4: Roots of strategic sgility scale

About What is related to the saturation percentages for the items of the strategic agility scale, which express the square of the simple correlation coefficient between each item with the three factors extracted according to the results of the factorial analysis. It recorded high percentages that exceeded the percentage specified for the significant significance of (0.30), which is as shown in the table 4.7 and according to the factors. The three produced by the exploratory factor analysis.

Table 15: Saturation ratios for the strategic agility scale paragraphs

	Component		
	1	**2**	**3**
Strategic Sensitivity	0.822		
Strategic Sensitivity	0.877		
Strategic Sensitivity	0.817		
Leadership Unity		0.813	
Leadership Unity		0.845	
Leadership Unity		0.834	
Resource Fluidity			0.831
Resource Fluidity			0.833
Resource Fluidity			0.824

4.3.3. Exploratory factor analysis of firm innovation variable

This scale includes (6) paragraphs divided into three main dimensions. The extent of its validity is tested in measuring the variable of the Firm Innovation, as it is clear from the table (4-8) that the suitability of the number of sample members has (0.917) It is a statistical value (KMO), which is greater than (0.50), that is, it is an acceptable value, which indicates that the sample is suitable for conducting factor analysis. As for the extent to which there are correlations between the items of the scale, this can be verified through the (Bartlett's test) scale, as it is clear that the significance level of the (Chi-Square) value has reached (0.000), which is less than (0.05), which indicates that the correlation matrix It is not a unit matrix, which makes the relationships between the items of the scale a significant function.

Table 16: (KMO) and (Bartlett's) test of the firm innovation scale

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.917**
Bartlett's Test of Sphericity	Approx. Chi-Square	**886.606**
	df	**15**
	Sig.	**0.000**

In terms of the major component analysis, it aids in figuring out how many fundamental factors (components) are used to split the scale's paragraphs, The (Eigenvalue), which were identified in the analysis by more than one correct one, the percentage of variance and the cumulative percentage of the explained variance, which must be more than (60%) for the main variable, that is, for the factors combined.

It is evident from the table (4.9) that the analysis of the primary components chose three main variables to describe the fundamental aspects of the senior management team's conduct, under which the scale-related paragraphs are grouped. Its (Eigenvalue) were more than one true, the cumulative percentage of the variance explained by the three factors (71.827) It exceeds the prescribed ratio of (0.60) indicating that there is statistical significance for the scale.

Table 17: The total explained variance of the firm innovation

Total Variance Explained						
Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.310	71.827	71.827	4.310	71.827	71.827
2	.475	7.918	79.744	.475	7.918	79.744
3	.428	7.140	86.884	.428	7.140	86.884
4	.317	5.287	92.171	.317	5.287	92.171
5	.245	4.088	96.259	.245	4.088	96.259
6	.224	3.741	100.000	.224	3.741	100.000

Figure 4.3 Shows the cumulative map of the potential roots, which represents the graph in which the value of the potential roots of the scale paragraphs (vertical axis) and the number of paragraphs (horizontal axis) is evident.

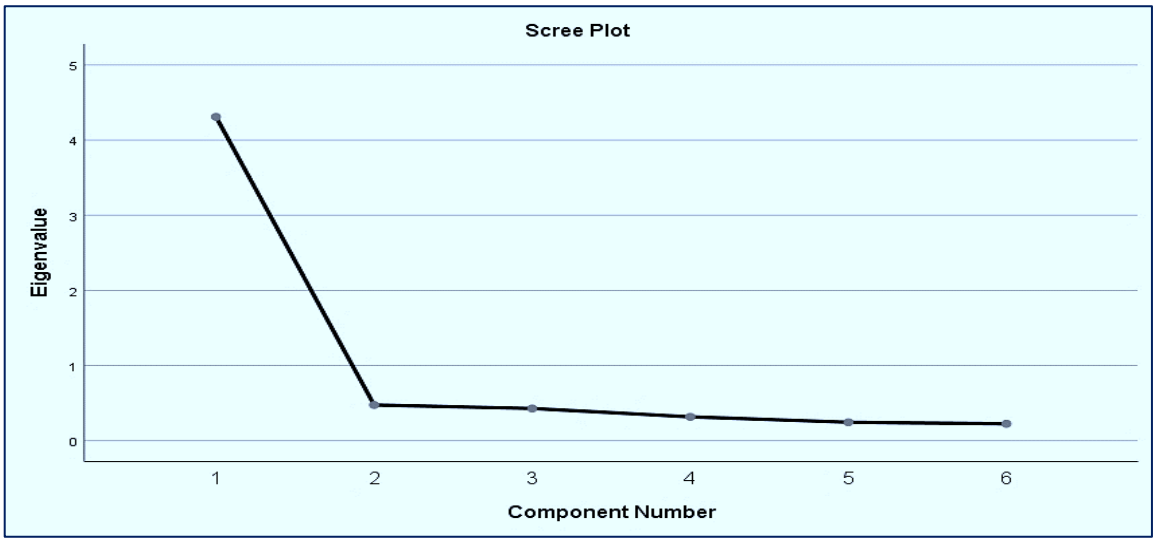

Figure 5: Roots of firm innovation scale

About What is related to the saturation percentages for the items of the strategic agility scale, which express the square of the simple correlation coefficient between each item with the three factors extracted according to the results of the factorial analysis. It recorded high percentages that exceeded the percentage specified for the significant significance of (0.30), which is as shown in the table (4.10) and according to the factors. The three produced by the exploratory factor analysis.

Table 18: Saturation percentages for the items of the (Firm Innovation) scale

Component Matrix[a]		
Dimensions	**Component**	
	1	2
1. Administrative innovation	.782	
2. Administrative innovation	.877	
3. Administrative innovation	.861	
1. Technological innovation.		.799
2. Technological innovation.		.861
3. Technological innovation.		.899

4.4. Confirmatory Factor Analysis (CFA) Test

Confirmatory factor analysis is one of the important and most powerful statistical methods for testing the nature of relationships between the various latent structures. In contrast to exploratory factor analysis, confirmatory factor analysis is based on testing pre-established hypotheses about the relationship between each of the observed and latent variables. Factorial analysis is also considered Exploratory (CFA) is an analytical tool suitable for developing measures, re-validating them, estimating the validity of their construction, in addition to evaluating the variance of their factors across different groups and time periods (Brown, 2015). Confirmatory factor analysis (CFA), also referred to as structural equation modeling (SEM), is crucial for confirming the accuracy of model and path studies. There has been a lot of interest in various applications in the subject of setting standards since the 1990s, particularly in the fields of education and psychology (Russell, 2002), Two criteria need to be confirmed in order to assess the structural model produced by confirmatory factor analysis.

- Parameter Estimates: represent the standard regressive weights or saturation ratios, which are the values shown on the arrows that link the dimensions to the paragraphs that measure them, as the parameter estimates are acceptable and feasible if they exceed Its value is (0.40).

- Model Fit Indices: Model conformity indicators are used to assess how closely the structural model created using the sample data adheres to the established standards and the framework used to create the scale, or to confirm that the data obtained is consistent with the fictitious model created for measurement in accordance with specific criteria.

Follow some conformity indicators will be relied upon, for which the extent of acceptance can be determined through the table (4-11).

Table 19: Structural model matching indicators (Shlaka & Jassem, 2022)

S	Pointers	Matching quality rule
1	**The ratio between x2 values and df degrees of freedom**	CMIN/DF < 5
2	**(CFI) Comparative Fit Index**	CFI > 0.90
3	**IFI The Incremental Fit Index**	IFI > 0.90
4	**TLI The Tucker-Lewis Index)**	TLI > 0.90
5	**(RMSEA) Root Mean Square Error of Approximation**	RMSEA < 0.08

4.4.1. Confirmatory Factor Analysis of the Top Management Team Behavioral Variable

Figure (4-4) shows that the approved scale for measuring the of the top management team behavior variable consists of (9) items distributed on three sub-dimensions, with (3) items for, Participative behavior (3) items information exchange, and (3) Participation in decision-making. It turns out that all standard parameter estimates have exceeded the accepted that was set for them, which is (0.40), which are significant ratios, because all the values of the critical ratio (C.R.) appearing in the table (4-11) are substantial values, which show that these parameters can be used and that they are accurate. The indications of model conformity all met the requirements outlined in the acceptance rule after three change indicators were made. As a result, the structural model has achieved a high degree of conformity to the sample's responses.

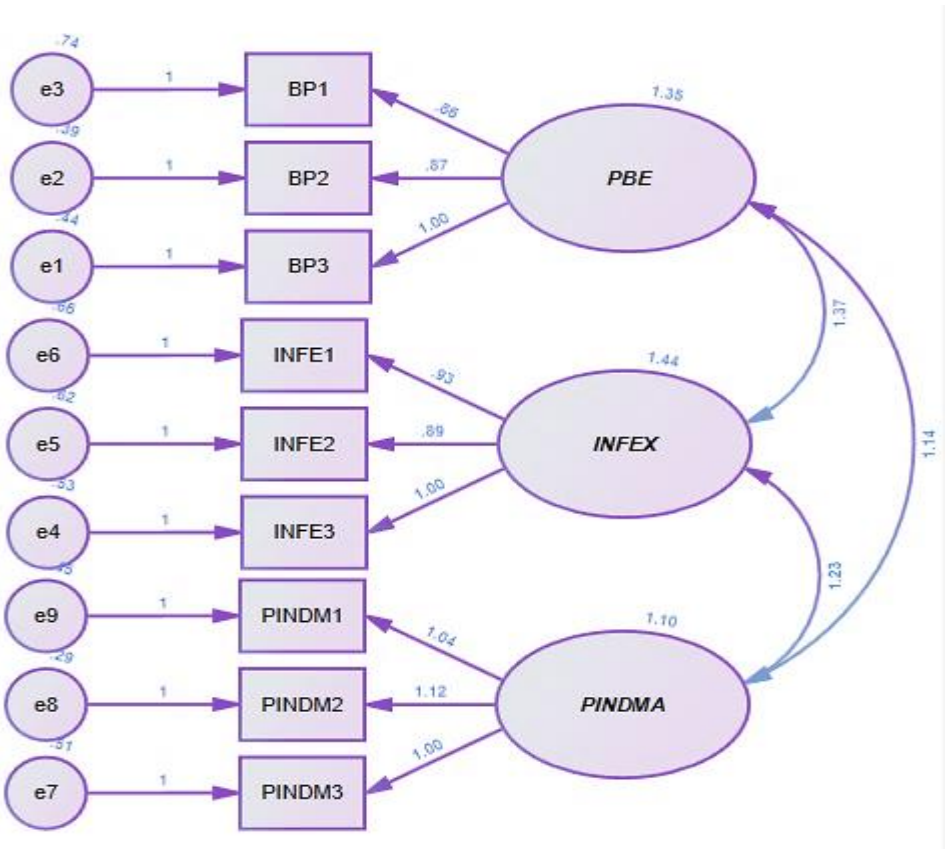

Figure 6: Confirmatory factor analysis of the top management team behavioral variable

Table 20: Parameters of confirmatory factor analysis of the top management team behavioral variable scale

Paths			Standardized Regression Weights	Estimate	S.E.	C.R.	P
PB3	**<---**	**Participative Behavior**	.867	1.000			
PB2	**<---**	**Participative Behavior**	.849	.868	.053	16.360	***
PB1	**<---**	**Participative Behavior**	.755	.855	.064	13.423	***
INFE3	**<---**	**Information Exchange**	.855	1.000			
INFE2	**<---**	**Information Exchange**	.805	.890	.060	14.877	***
INFE1	**<---**	**Information Exchange**	.808	.926	.062	14.984	***
PINDM3	**<---**	**Participation In Decision- Making**	.827	1.000			
PINDM2	**<---**	**Participation In Decision- Making**	.908	1.120	.066	16.945	***
PINDM1	<---	Participation In Decision-Making	.851	1.037	.068	15.281	***

4.4.2. Confirmatory Factor Analysis of the Strategic Agility Variable

Figure (4-6) shows that the approved scale for measuring the behavior variable of the senior management team consists of (9) items distributed on three sub-dimensions, with (3) items for, Strategic Sensitivity (3) items for Leadership Unity, and (3) items for Resource Fluidity. It turns out that all standard parameter estimates have exceeded the accepted that was set for them., which is (0.40), which are significant ratios, because all the values of the critical ratio (C.R.) appearing in the table (4-20) are substantial values, which show that these parameters can be used and that they are accurate. The indications of model conformity all met the requirements outlined in the acceptance rule after three change indicators were made. As a result, the structural model has achieved a high degree of conformity to the sample's responses.

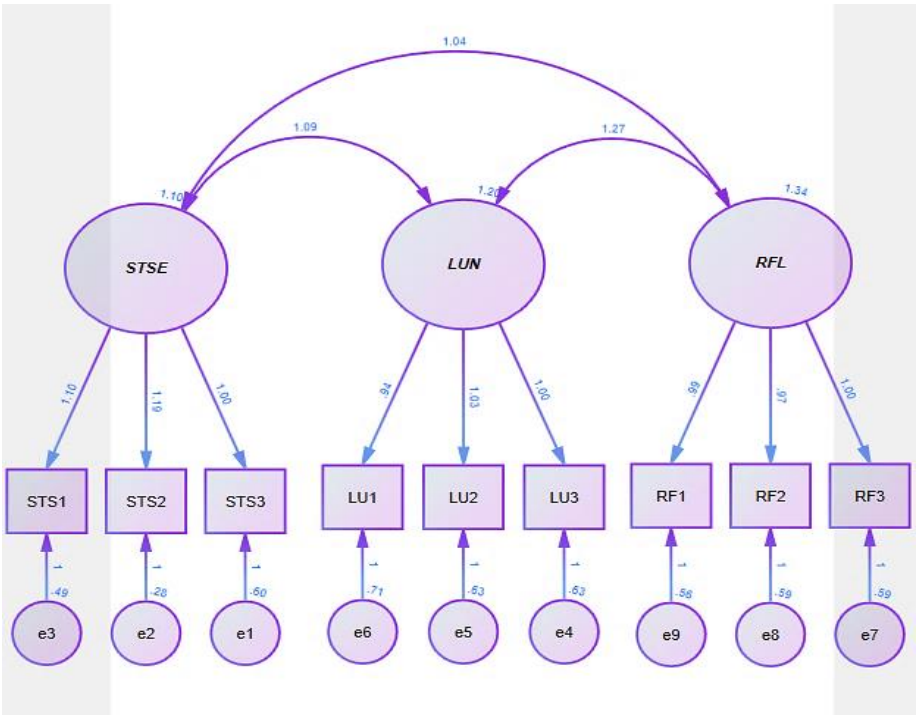

Figure 7: Confirmative factor analysis of the strategic agility variable

Table 21: Parameters of confirmatory factor analysis of the strategic agility variable measure

Paths			Standardized Regression Weights	Estimate	S.E.	C.R.	P
STS3	<---	**Strategic Sensitivity**	.806	1.000			
STS2	<---	**Strategic Sensitivity**	.921	1.191	.074	16.122	***
STS1	<---	**StrategicSensitivity**	.856	1.100	.075	14.626	***
LU3	<---	**Leadership Unity**	.810	1.000			
LU2	<---	**Leadership Unity**	.817	1.028	.072	14.182	***
LU1	<---	**Leadership Unity**	.775	.939	.071	13.157	***
RF3	<---	**Resource Fluidity**	.832	1.000			
RF2	<---	**Resource Fluidity**	.824	.965	.067	14.422	***
RF1	<---	**Resource Fluidity**	.835	.987	.067	14.729	***

4.4.3. Confirmatory Factor Analysis of the Firm Innovation Variable

Figure (4-6) shows that the approved scale for measuring the behavior variable of the senior management team consists of (6) items distributed on three sub-dimensions, with (2) items for, Strategic Sensitivity (2) items for Leadership Unity. It turns out that all standard parameter estimates have exceeded the accepted % that was set for them., which is (0.40), which are significant ratios, because all the values of the critical ratio (C.R.) appearing in the table (4-21) are substantial values, which show that these parameters can be used and that they are accurate. The indications of model conformity all met the requirements outlined in the acceptance rule after three change indicators were made. As a result, the structural model has achieved a high degree of conformity to the sample's responses.

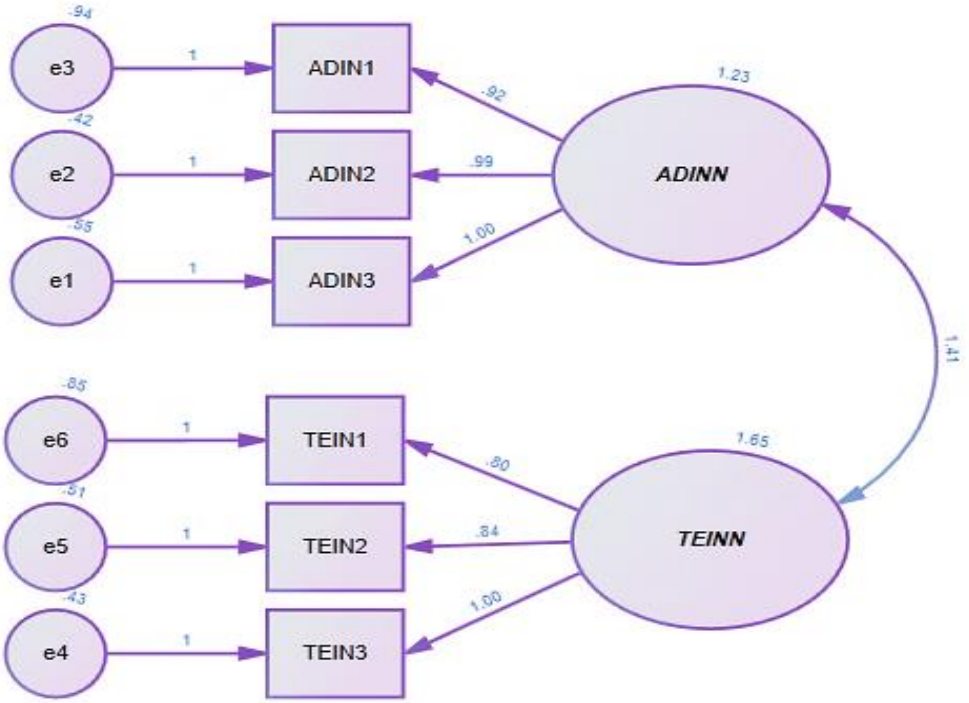

Figure 8: Confirmatory factor analysis of the of the firm innovation variable

Table 22: Parameters of confirmatory factor analysis of the firm innovation variable scale

		Paths	Standardized Regression Weights	Estimate	S.E.	C.R.	P
ADIN3	**<---**	**Administrativeinnovation**	.831	1.000			
ADIN2	**<---**	**Administrative innovation**	.863	.994	.064	15.501	***
ADIN1	**<---**	**Administrative innovation**	.723	.916	.077	11.974	***
TEIN3	**<---**	**Technological innovation**	.890	1.000			
TEIN2	**<---**	**Technological innovation**	.834	.840	.051	16.405	***
TEIN1	**<---**	**Technological innovation**	.746	.805	.060	13.491	***

4.5. Structural Stability and Structural Validity of the Measuring Instrument

This test is used to measure the degree of consistency of the respondents' answers to all the questions in the scale and to the extent that each question measures the same concept, these questions are linked to each other, and the most common tests are to measure the degree of correlation between the components of the scale (Taherdoost,

2016). To verify the consistency of the measurement tool, the research adopted the most common method, which is Cronbach alpha, whose value is considered reliable whenever it exceeds (0.70) at the level of behavioral research (Tavakol & Dennick, 2011). These values are acceptable in descriptive studies as they are high values compared to Cronbach's alpha standard values of (0.70). And as shown in Table (4-21). This confirms the consistency between the components of the scale and thus the stability of the required in the event of repeating the test.

Table 23: Stability coefficients and structural validity at the level of the main variables and their sub-dimensions

The Main Variables	Sub-Dimensions	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
Top Management Team Behavioral	Participative Behavior	.862	.865
	Information Exchange	.864	.865
	Participation In Decision- Making	.896	.896
Strategic Agility	Strategic Sensitivity	.894	.894
	Leadership Unity	.842	.842
	Resource Fluidity	.869	.869
Firm Innovation	Administrative innovation	.841	.844
	Technological innovation	.861	.861

4.6. Internal Consistency Test

Internal consistency means the extent to which each paragraph of the questionnaire is consistent with the field to which this paragraph belongs. the strength of the correlation and the extent of its significance in this context (Naser & Al Shobaki, 2016). Thus, this test aims to verify the extent to which there is internal (correlation) consistency between the variables and dimensions of the current study with its paragraphs, and the researcher relied on using the (Pearson) correlation coefficient to find out the significant correlations between those variables, dimensions and their paragraphs, as the significant correlations indicate the strength of the approved measure.

Table (4-16) shows the values of the correlation coefficients between all the items of the scale, its variables and dimensions, as the values of the test results shown in Table (4-16) show that there are significant correlations at a significant level (0.01) between the variables and items on the one hand and the dimensions and items on the

other hand, It ranged between (0.626** - 0.846**) at a significant level (0.01), while the correlation coefficients between variables and standard items ranged between (0.737 - 0.478) at a significant level (0.01), and this indicates a high internal consistency among all Dimensions and their paragraphs.

Table 24: The internal consistency between the paragraphs of the scale, variables and dimensions:

The main variables	Sub- Dimensions	Dimension code	Paragraph Consistency with Dimension	Paragraph Consistency with Variable	Significant Level
Top managemet team behavioral	Participative behavior	PB1	.726**	.780**	0.01
		PB2	.711**	.847**	0.01
		PB3	.559**	.866**	0.01
	Information exchange	INFE1	.582**	.838**	0.01
		INFE2	.641**	.836**	0.01
		INFE3	.631**	.869**	0.01
	Participation In Decision- Making	PINDM1	.594**	.854**	0.01
		PINDM2	.618**	.892**	0.01
		PINDM3	.566**	.830**	0.01
Strategic Agility	Strategic sensitivity	STS1	.720**	.822**	0.01
		STS2	.798**	.875**	0.01
		STS3	.681**	.815**	0.01
	Leadership unity	LU1	.618**	.813**	0.01
		LU2	.679**	.845**	0.01
		LU3	.627**	.835**	0.01
	Resource fluidity	REF1	.596**	.832**	0.01
		REF2	.567**	.833**	0.01
		REF3	.596**	.826**	0.01
Firm Innovation	Administrative innovation	ADIN1	.719**	.791**	0.01
		ADIN2	.617**	.870**	0.01
		ADIN3	.581**	.858**	0.01
	Technological innovation	TEIN1	.544**	.806**	0.01
		TEIN2	.617**	.856**	0.01
		TEIN3	.644**	.898**	0.01

4.7. Description and Statistical Analysis of the Study Variables

4.7.1. Introduction

This section includes presenting the results of the statistical analysis of the data collected through the study sample for the purpose of measuring the main variables of the study and its sub-dimensions and determining the results of descriptive statistics based on some statistical indicators such as (arithmetic mean, standard deviation, coefficient of difference, and relative importance) based on the outputs Microsoft Excel & SPSS programs), as follows: In order to determine the level of the study variables and

their availability according to the answers of the sample members in private companies of oil , the study sample, as follows:

4.7.2. Description and Diagnosis of the top Management Team Behavioral Variable: This Variable Consists of Three Sub-Dimensions, as Follow

4.7.2.1. Participative Behavior Dimension

Table 4.17 shows the results of the descriptive statistical analysis of the Participative Behavior dimension It was measured in three items (PB3-PB1) as the total arithmetic mean for this dimension was (3.113), the standard deviation (1.284), and the coefficient of relative difference (41.34%), and relative importance (57.75%) this indicates that the agreement of the sample The research on the paragraphs of this dimension was high, which confirms the interest of the top administrations of these companies in Participative behavior and coordination of activities among them in a cooperative manner in terms of cooperation in the implementation of scientific and administrative tasks and engagement to achieve integration of efforts on a regular basis to achieve goals and face challenges in light of the changing conditions in the contemporary educational environment. The first paragraph has got its content (When a firm board member is busy with something, he takes the initiative other members to help him lighten his burden) the highest, with a weighted arithmetic mean (2.93), a standard deviation of (1.319), With a relative difference coefficient of (45.02%) and a relative importance of (61.38%), this indicates that the level of responses to this paragraph was high. While the second paragraph got its content (The flexibility of the faculty council members makes their work even more easier) the lowest weighted arithmetic mean, which amounted to (3.21) a standard deviation of (1.343), with a relative coefficient of difference of (41.83%), and with a relative importance of (55.83%) Which indicates the need to enhance the state of flexibility more among the members of the senior management team of the oil companies, the study sample in a larger way.

Table 25: Descriptive statistics for participative behavior dimension

Items	Mean	Std. Deviation	Variation Coefficient%	Relative importance%	Items arrange
When a firm board member is busy with something, he takes the initiative other members to help him lighten his burden	2.93	1.319	45.02%	61.38%	1
The flexibility of the faculty council members makes their work even more ease.	3.20	1.190	37.18%	56.01%	2
Firm board members are willing to help each other with complex tasks.	3.21	1.343	41.83%	55.83%	3
Overall average for Participative Behavior	3.113	1.284	41.34%	57.75%	_

4.7.2.2. Information Exchange Dimension

Table 4.18 shows the results of the descriptive statistical analysis of the information exchange dimension that was measured in three items (INFE3- INFE1) as the total arithmetic mean for this dimension was (3.20), the standard deviation (1.37), and the coefficient of relative difference (42.92%), and relative importance (63.98%) .This indicates that the agreement of the members of the research sample on the paragraphs of this dimension was high, which confirms that the departments of the companies in the research sample are interested in the dimension of information exchange between members of the Council of Companies to facilitate the work of scientific departments and administrative divisions and to build bridges of communication between members of the top management team to transfer scientific and administrative information of all kinds to achieve The best benefit from it in the management of scientific and administrative affairs and decision-making processes and improving the nature of activities and performance in the final outcome. This is what the researcher sought through repeated field visits and interviews with a group of managers, members of top management teams, their assistants, and heads of departments in these colleges. And discussing them to reach realistic solutions that enable them to keep pace with environmental changes and challenges.

The second paragraph, whose content (The solutions proposed by the members of the firm Council for the problems presented are very good and realistic) got the highest average, as it reached with a weighted arithmetic mean (3.21) a standard deviation of (1.332), With a relative difference coefficient of (41.50%) and a relative

importance of (64.17%), this indicates that the level of responses to this paragraph was high. While the first paragraph which its content (The ideas exchanged between members of the firm board are of good quality) got the lowest weighted arithmetic mean, which amounted to (3.19), with a standard deviation of (1.38), with a relative coefficient of difference of (43.26%), and with a relative importance of (63.80%) Although this paragraph had the lowest arithmetic mean, it still enjoyed a high level of responses, according to the answers of the sample.

Table 26: Descriptive statistics for information exchange dimension

Items	Mean	Std. Deviation	Variation Coefficient%	Relative importance%	Items arrange
The ideas exchanged between members of the firm board are of good quality	3.19	1.38	43.26%	63.80%	3
The solutions proposed by the members of the firm Council for the problems presented are very good and realistic	3.21	1.332	41.50%	64.17%	1
The mutual dialogue between the members of the corporate board results in the presentation of innovative and creative ideas	3.2	1.408	44.00%	63.98%	2
Overall average for Information Exchange	3.20	1.37	42.92%	63.98%	_

4.7.2.3. Participation in Decision- Making Dimension

Table (4-19) shows the results of the descriptive statistical analysis of the information exchange dimension that was measured in three items (PINDM3- PINDM1) as the total arithmetic mean for this dimension was (3.18), the standard deviation (1.28), and the coefficient of relative difference (40.32%), and relative importance (63.64%), This indicates that the agreement of the research sample on the paragraphs of this dimension was high, which confirms the research sample's interest in active and serious decision-making, as participation is a useful way for ideas, opinions, and proposals to interact and cross-pollinate in order to make mature decisions about the work practices of the research sample companies and talk about potential solutions to problems that frequently arise, especially with regard to the quality of services obtained from strategic

decision-making at the level , The first paragraph, whose content (Firm board members have the authority to inform one another of events that influence their work), got the highest arithmetic mean, as it reached (3.25), with a standard deviation of (1.28), with a relative coefficient of difference of (39.38%), and a relative importance of (65.00%).While the second paragraph whose content (The ideas exchanged between members of the firm board are of good quality) got the lowest arithmetic mean, reaching (3.09), with a standard deviation of (1.296), with a relative coefficient of difference of (41.94%), and a relative importance of Although this paragraph had the lowest arithmetic mean, it still enjoyed a high level of responses, according to the answers of the respondents.

Table 27: Descriptive statistics for participation in decision- making dimension

Items	Mean	Std. Deviation	Variation Coefficient%	Relative importance%	Items arrange
Firm board members have the authority to inform one another of events that influence their work.	3.25	1.28	39.38%	65.00%	1
Members of the company council are acutely aware of both the difficulties posed by their jobs and the needs of their fellow members	3.09	1.296	41.94%	61.76%	3
Firms board members are keen to discuss and not ignore the ideas and expectations of other members	3.21	1.272	39.63%	64.17%	2
Overall average for Participation in Decision- Making	3.18	1.28	40.32%	63.64%	_

4.7.2.4. Description and Diagnosis of the Behavioral Integration Variable of the top Management team as a Whole

Table 4.20 includes the descriptive statistics of the behavioral integration variable of the senior management team and its overall dimensions, as table (4-20) shows the results of the descriptive statistics of the behavioral integration variable of the top management team, which is measured by three field dimensions the total arithmetic mean for this variable was (3.16) the value of the standard deviation was (1.31) and the coefficient of difference was (41.53%), and the achieved relative importance

was (61.79%). These statistical results indicate that the behavioral integration variable of the senior management team has gained a high degree of importance according to the answers of the respondents, which indicates that the departments of the oil companies in the city of Erbil, the research sample, care greatly about the level of behavioral integration among its members, in terms of encouraging the exchange of information. And experiences and the transfer of skills among its members and seeks to encourage cooperative behavior among them in particular in the performance of administrative duties and how to solve problems in addition to the belief in their participation in decision-making and interest in their proposals, opinions and comments about procedures for completing work and how to achieve goals

In order to arrange the importance of the dimensions of the independent variable, the behavioral integration of the senior management team, the coefficient of difference was used depending on the arithmetic mean and standard deviation, and the table (4-26) shows this at the level of oil companies in the city of Erbil. The research sample was arranged as follows (Information Exchange, Participation in Decision- Making, and Participative Behavior, according to the answers of the sample.

Table 28: Descriptive statistics for top management team behavioral variable

Items	Mean	Std. Deviation	Variation Coefficient%	Relative importance%	Items arrange
Participative Behavior	3.113	1.284	41.34%	57.75%	3
Information Exchange	3.20	1.37	42.92%	63.98%	1
Participation In Decision- Making	3.18	1.28	40.32%	63.64%	2
Overall	3.16	1.31	41.53%	61.79%	

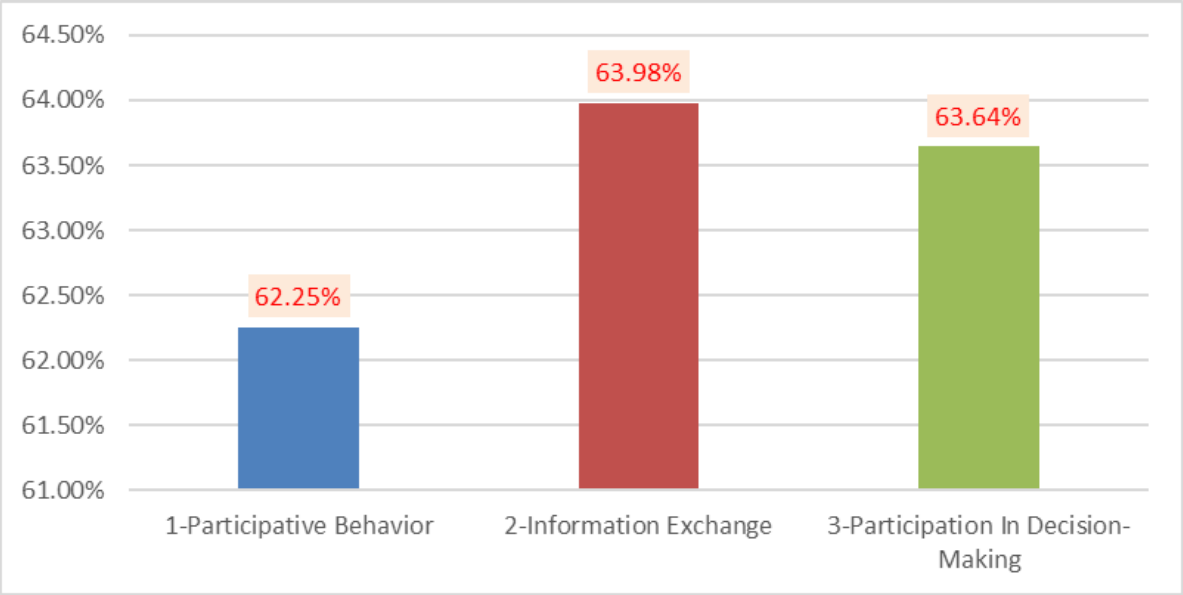

Figure 9: Graphic representation of top management team behavioral dimensions

4.7.3. Description and Diagnosis of Strategic Agility

This variable consists of four sub-dimensions, as follows:

4.7.3.1. Description and Diagnosis of the Dimension of Strategic Sensitivity

Table (4-21) shows the results of the descriptive statistical analysis of the Strategic Sensitivity dimension that was measured in three items (STS3- STS1) as the total arithmetic mean for this dimension was (3.08), the standard deviation (1.34), and the coefficient of relative difference (43.62%), and relative importance (61.57%), this indicates that the agreement of the study sample on the paragraphs of this dimension was high, which demonstrates that the study sample is interested in sensing the environmental factors and societal circumstances that are constantly changing and have an impact on the overall performance of the oil companies, the study sample in particular, and it seeks to adapt and adapt to these changes in order to deal with the circumstances. and ensuring that services are provided at the highest standard necessary. The second paragraph, whose content (my firm recognizes the need to try new business models), got the highest arithmetic mean, as it reached (3.22), with a standard deviation of (1.362), with a relative coefficient of difference of (42.30%), and a relative importance of (64.35%) This shows that this paragraph received a lot of reactions .While the first paragraph whose content (my firm anticipates future customer needs) got the

lowest arithmetic mean, reaching (2.95), with a standard deviation of (1.353) with a relative coefficient of difference of (45.86%), and a relative importance of (59.07%) ,Although this paragraph had the lowest arithmetic mean, it still enjoyed a high level of responses, according to the answers of the sample.

Table 29: Descriptive statistics for Strategic Sensitivity dimension

Items	Mean	Std. Deviation	Variation Coefficient%	Relative importance%	Items arrange
My firm anticipates future customer needs.	2.95	1.353	45.86%	59.07%	3
My firm recognizes the need to try new business models	3.22	1.362	42.30%	64.35%	1
My firm adopts new ways of doing business from other companies.	3.06	1.307	42.71%	61.30%	2
Overall average for Strategic Sensitivity	3.08	1.34	43.62%	61.57%	

4.7.3.2. Leadership Unity Dimension

Table 4.22 shows the results of the descriptive statistical analysis of the Strategic Sensitivity dimension that was measured in three items (LU3- LU1) as the total arithmetic mean for this dimension was (3.09), the standard deviation (1.36), and the coefficient of relative difference (%5.535), and relative importance (62.50%), this indicates that the agreement of the study sample on the paragraphs of this dimension was high, which confirms that the study sample is genuinely interested in growing its leadership skills and that it seeks to rely on fostering a culture of cooperation and teamwork among its leaders and how they interact and share knowledge among one another to enhance the transfer of skills. enhancing the leadership team's scientific and field credentials and learning how to turn experience into useful behaviors. The third paragraph, whose content (My organization's leaders open up about their underlying motivations, including their hopes, prejudices, and anxieties), got the highest arithmetic mean, as it reached (3.19), with a standard deviation of (1.358), with a relative coefficient of difference of (42.57%), and a relative importance of (63.70%) This shows that this paragraph received a lot of reactions .While the first paragraph whose content (The managers are aligned around a common interest through a compelling mission, aspirational vision, shared values, and emotion) got the lowest arithmetic mean, reaching

(2.95), with a standard deviation of (1.332) with a relative coefficient of difference of (45.15%), and a relative importance of (61.30%) ,Although this paragraph had the lowest arithmetic mean, it still enjoyed a high level of responses, according to the answers of the sample.

Table 30: Descriptive statistics for leadership unity dimension

Items	Mean	Std. Deviation	Variation Coefficient%	Relative importance%	Items arrange
The managers are aligned around a common interest through a compelling mission, aspirational vision, shared values, and emotion.	2.95	1.332	45.15%	61.30%	3
The managers of operate as an integrated, interdependent, value- creating team.	3.12	1.384	44.36%	62.50%	2
The leaders of my organization reveal their underlying motives including aspirations, biases, and fears.	3.19	1.358	42.57%	63.70%	1
Overall average for Leadership Unity	3.09	1.36	44.03%	62.50%	-

4.7.3.3. Resource Fluidity Dimension

Table (4-23) shows the results of the descriptive statistical analysis of the Strategic Sensitivity dimension that was measured in three items (RF3- RF1) as the total arithmetic mean for this dimension was (3.10), the standard deviation (1.37), and the coefficient of relative difference (44.31%), and relative importance (61.70%), this indicates that the agreement of the study sample on the paragraphs of this dimension was high, It demonstrates that the study sample is concerned with how to distribute and redistribute its resources in accordance with the needs of the organizational structure, levels of the organization, and the circumstances that surround them. Additionally, it aims to gain from the distribution of its organizational resources and the potential to transfer them in accordance with the need to make the best investment in order to increase the overall positive aspects and decrease the negative aspects that may arise from errors in resource allocation or their inconsistency with the needs of organizational formations. The third paragraph, whose content (In the firm underlying business systems and processes are modular and easily changed), got the highest arithmetic mean, as it

reached (3.16), with a standard deviation of (1.393), with a relative coefficient of difference of (44.08%), and a relative importance of (62.31%) This shows that this paragraph received a lot of reactions .While the first paragraph whose content (Resources in firms are easily accessed across firm's boundaries) got the lowest arithmetic mean, reaching (3.06), with a standard deviation of (1.37) with a relative coefficient of difference of (44.77%), and a relative importance of (61.11%) ,Although this paragraph had the lowest arithmetic mean, it still enjoyed a high level of responses, according to the answers of the sample.

Table 31: Descriptive statistics for resource fluidity dimension

Items	Mean	Std. deviation	Variation coefficient%	Relative importance%	Items arrange
Resources in firms are easily accessed across firm's boundaries	3.06	1.37	44.77%	61.11%	3
The elements of my organization (e.g., departments, lines of business) are loosely coupled and flexible.	3.08	1.358	44.09%	61.67%	2
In the firm underlying business systems and processes are modular and easily changed.	3.16	1.393	44.08%	62.31%	1
Overall average for resource fluidity	3.10	1.37	44.31%	61.70%	-

4.7.3.4. Description and Diagnosis of the Overall Strategic Agility Variable

This paragraph includes descriptive statistics for the strategic agility variable and its overall dimensions, as table (4-24) shows the results of the descriptive statistics for the strategic agility variable, which is measured in three field dimensions, as the total arithmetic mean for this variable was (3.09) the value of the standard deviation was (1.36) and the coefficient of difference was (43.99%), and the achieved relative importance was (61.92%). These statistical results indicate that the study sample cares deeply about the level of its strategic agility and the ability to move to different scenarios to respond to and adapt to the change of environmental and societal conditions surrounding it, as shown by these statistical results, which show that the strategic agility variable has gained a high degree of importance according to the responses of the respondents. As for the arrangement of the dimensions of strategic agility in the field at

the level of the study sample companies, they were arranged as follows (resource fluidity, leadership unity, Strategic Sensitivity), respectively, according to the answers of the sample members, and as shown in Table (4-24) This is from: It would enhance its role in forecasting and preparing for change

Table 32: Descriptive statistics for strategic agility Variable

Dimensions	Mean	Std. deviation	Variation coefficient%	Relative importance%	Items arrange
strategic sensitivity	3.08	1.34	43.62%	61.57%	3
leadership unity	3.09	1.36	44.03%	62.50%	1
resource fluidity	3.10	1.37	44.31%	61.70%	2
Overall average for strategic agility variable	3.09	1.36	43.99%	61.92%	

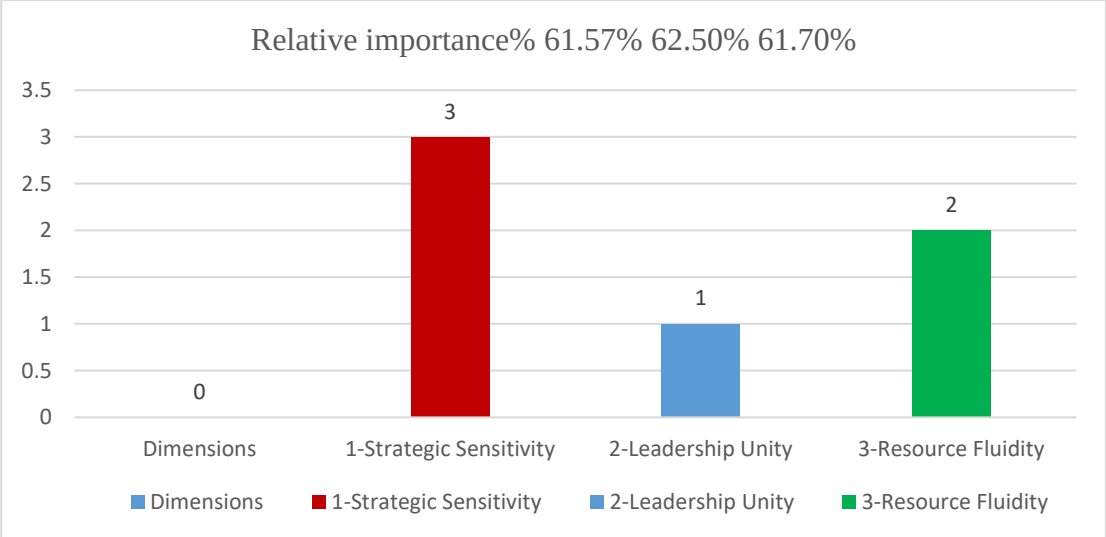

Figure 10: Graphical representation of Strategic Agility dimensions

4.7.4. Description and diagnosis of firm innovation

4.7.4.1. Administrative Innovation Dimension

Table 4.25 shows the results of the descriptive statistical analysis of the Strategic Sensitivity dimension that was measured in three items (ADIN3– ADIN1) as the total arithmetic mean for this dimension was (3.16), the standard deviation (1.34), and the coefficient of relative difference (42.49%), and relative importance (63.24%), this

indicates that the agreement of the study sample on the paragraphs of this dimension was high, This supports that the importance of oil companies, the study sample, has a good application rate for administrative innovation, and that the departments in these companies are able to produce, innovate and develop new services, which improves their performance and production. The third paragraph, whose content (The company introduced new policies in the area of recruitment, bonuses and incentives), got the highest arithmetic mean, as it reached (3.27), with a standard deviation of (1.338), with a relative coefficient of difference of (40.92%), and a relative importance of (65.46%) This shows that this paragraph received a lot of reactions .While the second paragraph whose content (The company introduced new policies in the area of recruitment, bonuses and incentives) got the lowest arithmetic mean, reaching (3.01), with a standard deviation of (1.281) with a relative coefficient of difference of (42.56%), and a relative importance of (60.28%) ,Although this paragraph had the lowest arithmetic mean, it still enjoyed a high level of responses, according to the answers of the sample.

Table 33: Descriptive statistics for administrative innovation dimension

Items	Mean	Std. Deviation	Variation Coefficient%	Relative importance%	Items arrange
The company has introduced radical changes in its organizational structures.	3.2	1.408	44.00%	63.98%	2
The company made extreme changes in the use of computer systems in its administrative operations.	3.01	1.281	42.56%	60.28%	3
The company introduced new policies in the area of recruitment, bonuses and incentives.	3.27	1.338	40.92%	65.46%	1
Overall average for administrative innovation	3.16	1.34	42.49%	63.24%	_

4.7.4.2. Technological Innovation Dimension

Table (4-27) shows the results of the descriptive statistical analysis of the Strategic Sensitivity dimension that was measured in three items (TEIN3– TEIN1) as the total arithmetic mean for this dimension was (3.16), the standard deviation (1.38),

and the coefficient of relative difference (43.57%), and relative importance (63.18%), this indicates that the agreement of the study sample on the paragraphs of this dimension was high, This supports that the administrative departments in the oil companies, the research sample, are able to produce and innovate new services and constantly use the best new technological techniques to carry out various work tasks. The second paragraph, whose content (The business has developed new strategies to construct, change, and enhance its service operations), got the highest arithmetic mean, as it reached (3.23), with a standard deviation of (1.295), with a relative coefficient of difference of (40.09%), and a relative importance of (64.63%) This shows that this paragraph received a lot of reactions .While the first paragraph whose content (The company introduced new policies in the area of recruitment, bonuses and incentives) got the lowest arithmetic mean, reaching (3.12), with a standard deviation of (1.445) with a relative coefficient of difference of (46.31%), and a relative importance of (62.41%) ,Although this paragraph had the lowest arithmetic mean, it still enjoyed a high level of responses, according to the answers of the sample.

Table 34: Descriptive statistics for Technological innovation dimension

Items	Mean	Std. Deviation	Variation Coefficient%	Relative importance%	Items arrange
The company has made changes in the design and delivery of its services in line with the quality of modern technologies.	3.13	1.387	44.31%	62.50%	2
The business has developed new strategies to construct, change, and enhance its service operations.	3.23	1.295	40.09%	64.63%	1
The company has introduced new technologies to improve its services compared to competitors.	3.12	1.445	46.31%	62.41%	3
Overall average for Technological innovation	3.16	1.38	43.57%	63.18%	_

4.7.4.3. Description and Diagnosis of the Overall Firm Innovation Variable

This paragraph includes descriptive statistics for the firm innovation variable and its overall dimensions, as table (4-28) shows the results of the descriptive statistics for the firm innovation variable, which is measured in three field dimensions, as the total arithmetic mean for this variable was (3.16) the value of the standard deviation was

(1.36) and the coefficient of difference was (43.03%), and the achieved relative importance was (63.21%). These statistical results indicate These statistical findings, which demonstrate that the firm innovation airable has increased to a high degree of importance based on the responses of the respondents, demonstrate that the study sample cares passionately about the level of its firm innovation and the capacity to move to various scenarios to respond to and adapt to the change of environmental and societal conditions surrounding it. As for the arrangement of the dimensions of firm innovation in the field at the level of the study sample companies, they were arranged as follows (Administrative innovation, technological innovation), respectively, according to the answers of the sample members, and as shown in Table (4-28) This is from: It would enhance its role in forecasting and preparing for change.

Table 35: Descriptive statistics for firm innovation Variable

Dimensions	Mean	Std. Deviation	Variation Coefficient%	Relative importance%	Items arrange
Administrative innovation	3.16	1.34	42.49%	63.24%	**1**
Technological innovation	3.16	1.38	43.57%	63.18%	**2**
Overall average for firm innovation variable	3.16	1.36	43.03%	63.21%	

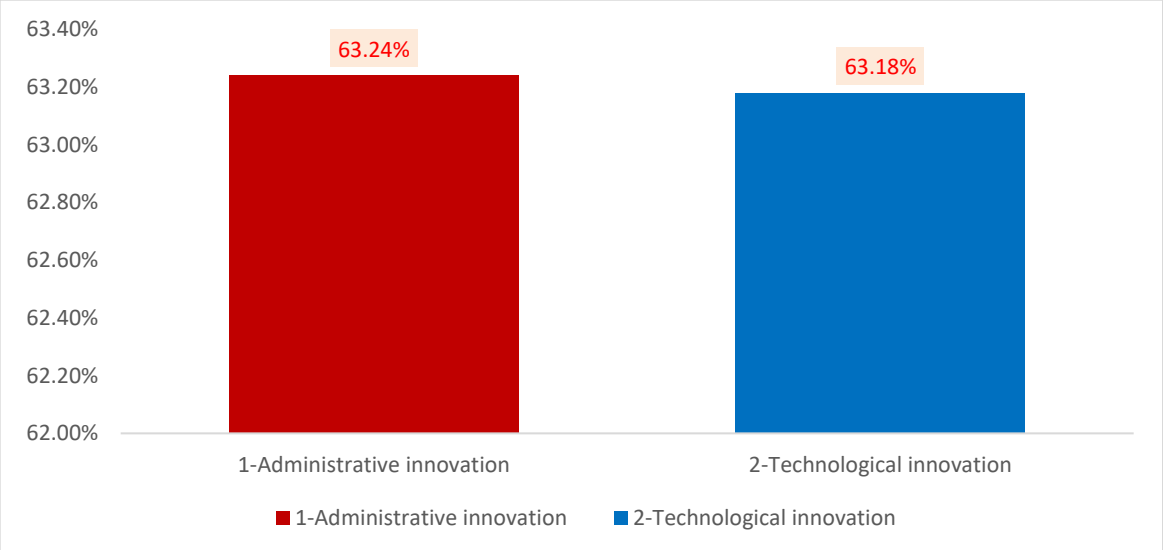

Figure 11: Graph for firm innovation dimensions

4.8. Study hypotheses test

4.8.1. Introduction

Examining the nature and degree of direct influence relationships between the variables, testing the modified role in light of the previously stated hypotheses, and taking into account the responses of the sample individuals and at the level of the oil companies, the study sample, are all included in this topic.

The researcher used the Pearson correlation coefficient to test the four main hypothesis, as it is used to determine the strength and type of relationship between two variables, and the Testing of particular hypotheses about the links between variables is possible with path analysis. This can support or contradict theoretical presumptions.

4.8.2. Research Hypotheses

Specific assertions or predictions regarding the anticipated differences or correlations between variables in a research study are known as research hypotheses. The research questions generate hypotheses, which offer a framework for evaluating and examining the data. They act as speculative explanations or forecasts that direct the study process and aid scientists in coming to conclusions about the data gathered.

The following hypothesis and sub-hypotheses are developed with the specific objectives established out above:

H1. top management team behavioral has positive effect on firm innovation.

H1a.participatory behavior has positive effect on administrative innovation.

H1b: participatory behavior has positive effect on technology innovation.

H1c: information exchange has positive effect on administrative innovation.

H1d: information exchange has positive effect on technology innovation.

H1e: participation in decision making has positive effect on administrative innovation.

H1f: participation in decision making has positive effect on technology innovation.

The Second Hypothesis:

H2. top management team behavior has positive effect on firm innovation.

H2a: participatory behavior has positive effect on strategic sensitivity.

H2b: participatory behavior has positive effect on leadership unity.

H2c: participatory behavior has positive effect on resource fluidity.

H2d: information exchange has positive effect on strategic sensitivity.

H2e: information exchange has positive effect on leadership unity.

H2f: information exchange has positive effect on resource fluidity.

H2g: participation in decision making has positive effect on strategic sensitivity.

H2h: participation in decision making has positive effect on leadership unity.

H2i: participation in decision making has positive effect on resource fluidity

Third Hypotheses:

H3: strategic agility has positive effect on firm innovation.

H3a: strategic sensitivity has positive effect on administrative innovation.

H3b: strategic sensitivity has positive effect on technology innovation.

H3c: leadership unity has positive effect on administrative innovation.

H3d: leadership unity has positive effect on technology innovation.

H3e: resource fluidity has positive effect on administrative innovation.

H3f: resource fluidity has positive effect on technology innovation.

H4: strategic agility has a mediation role in the effect of top management team behavior on firm innovation.

4.8.3. Research Model for the Study

It provides an overview of the main ideas, factors, and connections examined in a research study. The research model aids in the formulation of research questions, the development of hypotheses, and the choice of relevant research methodologies and procedures for data analysis.

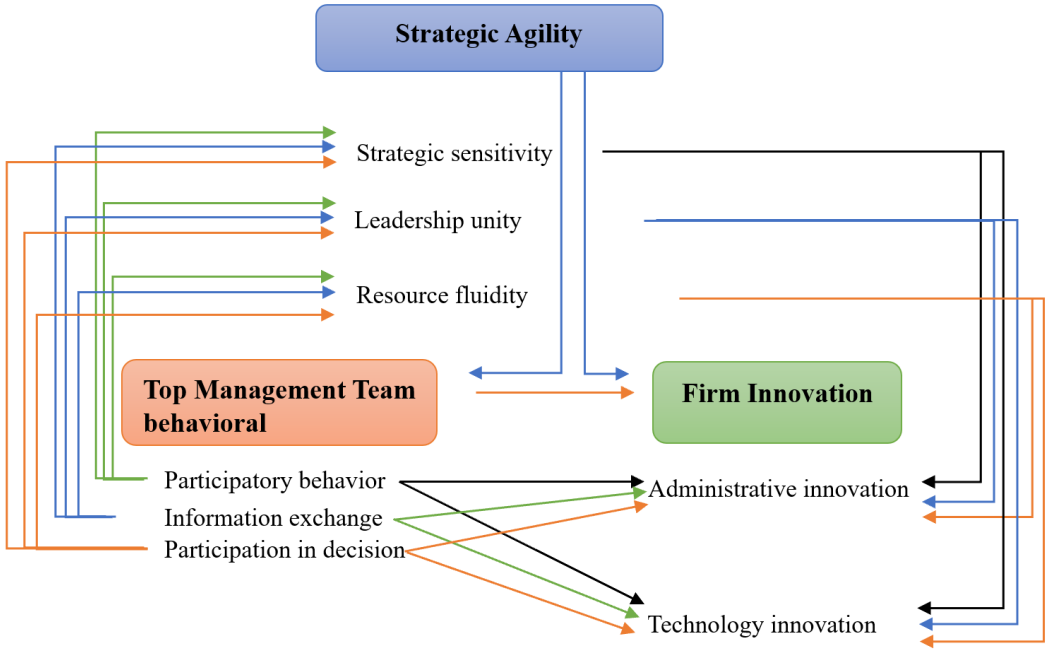

Figure 12: Research Model

4.9. Pearson Correlation Coefficients

Beginning with the bivariate correlations between the independent variable, the mediator variable, and the dependent variable, perform a correlation analysis. Calculate other suitable correlation measures, such as Pearson's correlation coefficients. If there is a significant correlation between all three variables, this may point to a mediating link.

A Statistical measure of the strength relationship between the relative movements of two variables, in this part we go further for our analysis and to know about the impacts of the independent variables on dependent variable, the inter-related correlation of the dependent and independent variables. Correlation coefficients (Pearson) appear between the variables of the current study and include an abbreviation (.Sig), which refers to the test of significance of the correlation coefficient by comparing the calculated value of (t) with the tabular one without showing its values, in addition to indicating the type of test (tailed), When the correlation coefficient has the sign (**), it means that the correlation coefficient is significant at the level (0.01) and with a confidence level (99), whereas the sign (*) means that the correlation coefficient is significant at the level (0.05) and with a confidence level (95%). Positive correlation ($r > 0$), Negative correlation ($r < 0$), No correlation ($r \approx 0$).

4.10. Direct Impact Hypothesis Testing

Psychologists and quantifiers have a larger chance of merging behavioral or cognitive findings based on numerous elements or components from diverse social, behavioral, and health sciences thanks to the continuously improving measurement and analytic methods. Thus, using structural equation modeling (SEM) to discover and investigate the nature of linkages can be a viable choice. based on hypotheses or knowledge discovered from earlier research between a collection of factors(Hwang et al., 2021). The structural equation modeling technique is also a very effective method in terms of representing the direct and indirect effects of the underlying variables on the factors measured in the hypothetical model. Thus, this technique is distinguished as the opposite of regression analysis, as it allows the inclusion of measurement errors in the analyzes because ignoring measurement errors can lead to biased parameter estimates. between the two variables, which exacerbates the problem without solving it (Sardeshmukh & Vandenberg, 2017). Thus, it is a modern advanced technique to determine the level of direct influence between variables, and it will be adopted for the purpose of testing the main influence hypotheses, path analysis enables academics to understand complex systems' underlying dynamics better and to make more educated decisions based on actual data.

4.10.1. Test of the First Main Hypothesis

H1: Top Management Team Behavioral has positive effect on Firm Innovation.

The results of Table (4-28) indicate that there is a strong, positive and significant correlation between top management team behavioral and firm innovation as the value of the correlation coefficient between them was (0. 816), and this value indicates the strength of the positive relationship between these two variables at a significant level (0.01).

Based on the foregoing, this relationship can be explained by the fact that the departments of the research sample companies are more interested in the dimensions of the top management team behavioral in terms of focusing on exchanging information and the importance of participative behavior in performing tasks and duties and believing in the importance of participating in decision-making through developmental proposals for work and this would achieve advanced levels of firm innovation.

Table 36: Shows the Pearson Correlation between independent variable Top Management behavioral and dependent Variable Firm innovation.

Correlations						
		FIN	**BP**	**INFE**	**PINDM**	**Top**
FIN	**Pearson Correlation**	1	.741**	.765**	.808**	.816**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	216	216	216	216	216

**. Correlation is significant at the 0.01 level (2-tailed).

4.10.2. Test of the First Sub-Hypothesis

H1a: participatory behavior has positive effect on administrative innovation.

Figure 4.12 shows that there is a positive and significant effect of the behavior dimension of the top management team behavioral on the innovation of companies, as we note that the value of the standard impact coefficient has reached (0.13), and this means that the dimension of cooperative behavior affects the innovation of companies by (13%) on the oil companies in Erbil, the study sample. This means that changing one unit deviation from the behavior of the senior management team in the study sample company will lead to a change in corporate innovation by (13%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-35) is (1.598) a significant value at a significant level of (0.001) means that accept these hypotheses, that participatory behavior has a positive effect on administrative innovation. According to the aforementioned, this relationship can be explained by the fact that the oil companies in Erbil, the research sample, place a strong emphasis on the spirit of cooperation and harmony in order to provide top-notch services and raise the level of administrative activities supporting the activities of primary focus, which in turn strengthens the efforts of departments in raising the level of innovation of companies. This result emphasizes how crucial collaborative efforts and are to fostering administrative innovation, particularly in the context of Erbil's oil businesses.

H1b: participatory behavior has positive effect on technological innovation.

Figure 4.12 shows that there is a positive and significant effect of the behavior dimension of the senior management team on the firm innovation, as noted that the value of the standard impact coefficient has reached (0.20), and this means that the dimension of cooperative behavior affects the innovation of firms by (20%) on the oil firms in Erbil, the study sample. This means that changing one unit deviation from the participatory

behavior in the study sample company will lead to a change in firm innovation by (20%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-35) is (2.241) is a significant value at a significant level of (0.001) means that accept these hypotheses, that participatory behavior has a positive effect on technology innovation. Innovation frequently faces less opposition in companies that promote participatory behavior.

H1c: information exchange has positive effect on administrative innovation.

Figure 4.12 shows that there is a positive and significant effect of the information exchange on the administrative innovation, as noted that the value of the standard impact coefficient has reached (0.20), and this means that the dimension of cooperative behavior affects the innovation of firms by (20%) on the oil firms in Erbil, the study sample. This means that changing one unit deviation from the of the information exchange in the study sample company will lead to a change in firm innovation by (20%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-35) is (2.241) it is a significant value at a significant level of (0.001) means that accept these hypotheses, that participatory behavior has a positive effect on administrative innovation.

H1d: information exchange has positive effect on technological innovation.

Figure 4.12 shows that the value of the standard impact coefficient has reached (0.13), and this means that the information exchange affects the innovation of firms by (13%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the information exchange in the study sample company will lead to a change in firm innovation by (13%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-35) is (0.179) it is higher than significant level of (0.001) means that reject these hypotheses, and information exchange doesn't have positively affected technological innovation.

H1e: participation in decision making has positive effect on administrative innovation.

Figure 4.12 shows that there is a positive and significant effect of the information exchange on the technological innovation, as noted that the value of the standard impact coefficient has reached (0.50), and this means that the information exchange affects the

innovation of firms by (50%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participation in decision making in the study sample company will lead to a change in firm innovation by (50%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-35) is (5.930) it is a significant value at a significant level of (0.001) means that accept these hypotheses, and participation in decision making has positive effect on administrative innovation.

H1F: participation in decision making has positive effect on technological innovation.

Figure 4.12 shows that there is a positive and significant effect of the participation in decision making has positive effect on technological innovation, as noted that the value of the standard impact coefficient has reached (0.53), and this means that the information exchange affects the innovation of firms by (53%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participation in decision making in the study sample company will lead to a change in firm innovation by (53%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-35) is (5.746) it is a significant value at a significant level of (0.001) means that accept these hypotheses, and participation in decision making has positive effect on technological innovation.

Table 37: Test paths and parameters of top management team behavioral effect on firm innovation

Paths			Std. regression weights	Estimate	S.E.	C.R.	P	Result
participatory behavior	<---	**administrative innovation**	.503	.133	.083	1.598	***	accept
participatory behavior	<---	**technology innovation**	.324	.202	.090	2.241	***	accept
informative exchange	<---	**administrative innovation**	.213	.205	.088	2.334	***	accept
informative exchange	<---	**technology innovation**	.128	.128	.095	1.342	.179	reject
participation in decision	<---	**administrative innovation**	.500	.501	.085	5.930	***	accept
participation in decision	<---	**technology innovation**	.505	.527	.092	5.746	***	accept

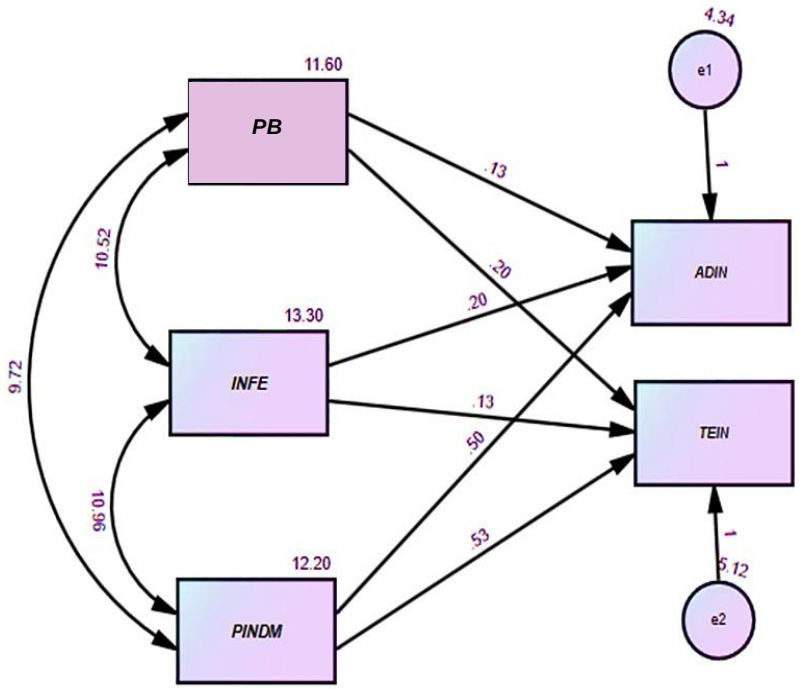

Figure 13: Impact of top management team behavioral on firm innovation

4.10.3. Second Main Hypothesis

H2: Top management team behavior has positive effect on strategic agility.

The results of Table (4-36) indicate that there is a strong, positive and significant correlation between top management team behavioral and strategic agility as the value of the correlation coefficient between them was (.814**), and this value indicates the strength of the positive relationship between these two variables at a significant level (0.000).

Table 38: The Pearson Correlation between independent variable top management behavioral and dependent variable strategic agility

Correlations						
		STA	**BP**	**INFE**	**PINDM**	**Top**
STA	**Pearson Correlation**	1	.745**	.770**	.794**	.814**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	216	216	216	216	216

4.10.4. Test the Second Sub-Hypothesis

H2a: Participatory behavior has positive effect on strategic sensitivity.

Figure 4.13 shows that there is a positive and significant effect of participatory behavior effect on strategic sensitivity, as noted that the value of the standard impact coefficient has reached (0.9), and this means that the information exchange affects the strategic agility by (9%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (9%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-37) is (2.011) it is a significant value at a significant level of (0.001) means that accept these hypotheses, and participation in decision making has positive effect on technological innovation.

H2b: Participatory behavior has positive effect on leadership unity.

Figure 4.13 shows that there is a positive and significant effect of participatory behavior effect on leadership unity, as noted that the value of the standard impact coefficient has reached (01.9), and this means that the participatory behavior affects the strategic agility by (19%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (19 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-37) is (2.058) it is a significant value at a significant level of (0.001) means that accept these hypotheses, and participatory behavior has positive effect on leadership unity.

H2c: Participatory behavior has positive effect on resource fluidity.

Figure 4.13 shows that there is a positive and significant effect of participatory behavior effect on resource fluidity, as noted that the value of the standard impact coefficient has reached (0.30), and this means that the participatory behavior affects the strategic agility by (30%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (30 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-

37) is (3.042) it is a significant value at a significant level of (0.001) means that accept these hypotheses, and participatory behavior has positive effect on leadership unity.

H2d: information exchange has positive effect on strategic sensitivity.

Figure 4.13 shows that there is a positive and significant effect of informative exchange effect on strategic sensitivity, as noted that the value of the standard impact coefficient has reached (0.33), and this means that the informative exchange affects the strategic agility by (33%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (33 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-37) is (3.687) it is a significant value at a significant level of (0.001) means that accept these hypotheses, and information exchange has positive effect on strategic sensitivity.

H2e: information exchange has positive effect on leadership unity.

Figure 4.13 shows that there is a positive and significant effect of informative exchange effect on leadership unity, as noted that the value of the standard impact coefficient has reached (0.45), and this means that the informative exchange affects the strategic agility by (33%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (33 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-37) is (3.687) it is a significant value at a significant level of (0.001) means that accept these hypotheses, and information exchange has positive effect on leadership unity.

H2f: information exchange has positive effect on resource fluidity.

Figure 4.13 shows that the value of the standard impact coefficient has reached (0.7), and this means that the information exchange affects the strategic agility by (7%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the information exchange in the study sample company will lead to a change in strategic agility by (7%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-37) is (.694) it is higher than significant level of (.488) means that reject these hypotheses, and information exchange doesn’t have positively affected strategic agility.

H2g: participation in decision making has positive effect on strategic sensitivity.

Figure 4.13 shows that there is a positive and significant effect of participation in decision making effect on strategic sensitivity, as noted that the value of the standard impact coefficient has reached (0.45), and this means that the participation in decision making affects the strategic agility by (45%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (45 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-37) is (5.089) it is a significant value at a significant level of (0.000) means that accept these hypotheses, and information exchange has positive effect on resource fluidity.

H2h: participation in decision making has positive effect on leadership unity.

Figure 4.13 shows that there is a positive and significant effect of informative exchange effect on strategic sensitivity., as noted that the value of the standard impact coefficient has reached (0.38), and this means that the information exchange affects the strategic agility by (38%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (38 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-37) is (3.974) it is a significant value at a significant level of (0.001) means that accept these hypotheses, and participation in decision making has positive effect on leadership unity.

H2i: participation in decision making has positive effect on resource fluidity

Figure 4.13 shows that there is a positive and significant effect of participation in decision making effect on resource fluidity, as noted that the value of the standard impact coefficient has reached (0.46), and this means that the information exchange affects the strategic agility by (46%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (46 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-37) is (4.591) it is a significant value at a significant level of (0.000) means that

accept these hypotheses, and participation in decision making has positive effect on resource fluidity.

Table 39: Parameters and Pathways of the impact of top management team behavioral effect on strategic agility

paths			STD. Regression Weights	Estimate	S.E.	C.R.	P	Result
Participatory Behavior	<---	**Strategic sensitivity**	.081	.087	.086	2.011	***	A
Participatory Behavior	<---	**leadership unity**	.184	.192	.093	2.058	***	A
Participatory Behavior	<---	**resource fluidity**	.276	.296	.097	3.042	***	A
Informative Exchange	<---	**Strategic sensitivity**	.335	.335	.091	3.687	***	A
Informative Exchange	<---	**leadership unity**	.235	.229	.099	2.322	***	A
Informative Exchange	<---	**resource fluidity**	.071	.071	.103	.694	.488	R
Participation In Decision	<---	**strategic sensitivity**	.427	.445	.088	5.089	***	A
Participation In Decision	<---	**leadership unity**	.372	.377	.095	3.974	***	A
Participation In Decision	<---	**resource fluidity**	.435	.456	.099	4.591	***	A

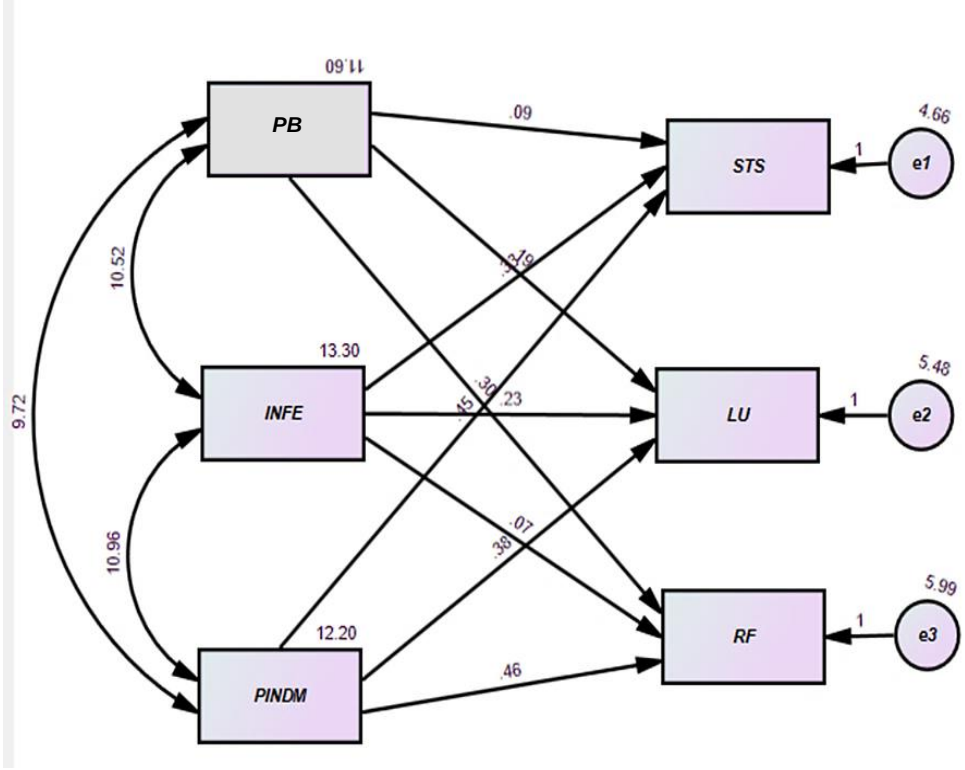

Figure 14: Impact of top management team on strategic agility

4.10.5. Third Main Hypothesis

H3: Strategic agility has positive effect on firm innovation.

The results of Table 4.38 indicate that there is a strong, positive and significant correlation between Strategic Agility and firm innovation as the value of the correlation coefficient between them was (0. .868**), and this value indicates the strength of the positive relationship between these two variables at a significant level (0.01).

Table 40: The Pearson Correlation between mediating variable Strategic Agility and dependent Variable Firm innovation.

Correlations						
		FIN	**STS**	**LU**	**RF**	**STA**
FIN	**Pearson Correlation**	1	.848**	.808**	.781**	.868**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	216	216	216	216	216
**. Correlation is significant at the 0.01 level (2-tailed).						

H3a: Strategic sensitivity has positive effect on administrative innovation.

Figure 4.14 shows that there is a positive and significant effect of administrative innovation effect on strategic sensitivity., as noted that the value of the standard impact coefficient has reached (0.46), and this means that the information exchange affects the firm innovation by (46%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (46 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-39) is (7.334) it is a significant value at a significant level of (0.001) this means that accept these hypotheses, and strategic sensitivity has positive effect on administrative innovation.

H3b: strategic sensitivity has positive effect on technology innovation.

Figure 4.14 shows that there is a positive and significant effect of strategic sensitivity effect on technology innovation, as noted that the value of the standard impact coefficient has reached (0.54), and this means that the information exchange affects the firm innovation by (54%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (54 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-39) is (8.125) it is a significant value at a significant level of (0.001) this means that accept these hypotheses, and strategic sensitivity has positive effect on administrative innovation.

H3c: leadership unity has positive effect on administrative innovation.

Figure 4.14 shows that there is a positive and significant effect of leadership unity effect on administrative innovation, as noted that the value of the standard impact coefficient has reached (0.54), and this means that the information exchange affects the firm innovation by (54%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (54 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-39) is (2.209) it is a significant value at a significant level of (0.001) this means that

accept these hypotheses, and leadership unity has positive effect on administrative innovation.

H3d: leadership unity has positive effect on technology innovation.

Figure 4.14 shows that there is a positive and significant effect of leadership unity effect on administrative innovation, as noted that the value of the standard impact coefficient has reached (0.18), and this means that the information exchange affects the firm innovation by (18%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (18 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-39) is (2.129) it is a significant value at a significant level of (0.001) this means that accept these hypotheses, and leadership unity has positive effect on technology innovation.

H3e: resource fluidity has positive effect on administrative innovation.

Figure 4.14 shows that there is a positive and significant effect of leadership unity effect on administrative innovation, as noted that the value of the standard impact coefficient has reached (0.29), and this means that the information exchange affects the firm innovation by (29%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (29 %). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-39) is (2.129) it is a significant value at a significant level of (0.001) this means that accept these hypotheses, and resource fluidity has positive effect on administrative innovation.

H3f: resource fluidity has positive effect on technological innovation

Figure 4.14 shows that there is a positive and significant effect of leadership unity effect on administrative innovation, as noted that the value of the standard impact coefficient has reached (0.17), and this means that the information exchange affects the firm innovation by (17%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the participatory behavior in the study sample company will lead to a change in Strategic Agility by (17 %). This value is

considered significant because the value of the critical ratio (C.R.) shown in Table (4-39) is (2.372) it is a significant value at a significant level of (0.000) this means that accept these hypotheses, and resource fluidity has positive effect on technological innovation.

Table 41: Parameters and Pathways of the impact of strategic agility effect on firm innovation.

paths			STD. Regression Weights	Estimate	S.E.	C.R.	P	Result
Strategic Sensitivity	<---	**Administrative Innovation**	.474	.445	.062	7.334	***	A
Strategic Sensitivity	<---	**Technology Innovation**	.541	.541	.067	8.125	***	A
Leadership Unity	<---	**Administrative Innovation**	.178	.405	.080	2.209	***	A
Leadership Unity	<---	**Technology Innovation**	.177	.511	.085	2.129	***	A
Resource Fluidity	<---	**Administrative Innovation**	.256	.245	.068	3.628	***	A
Resource Fluidity	<---	**Technology Innovation**	.173	.233	.072	2.372	***	A

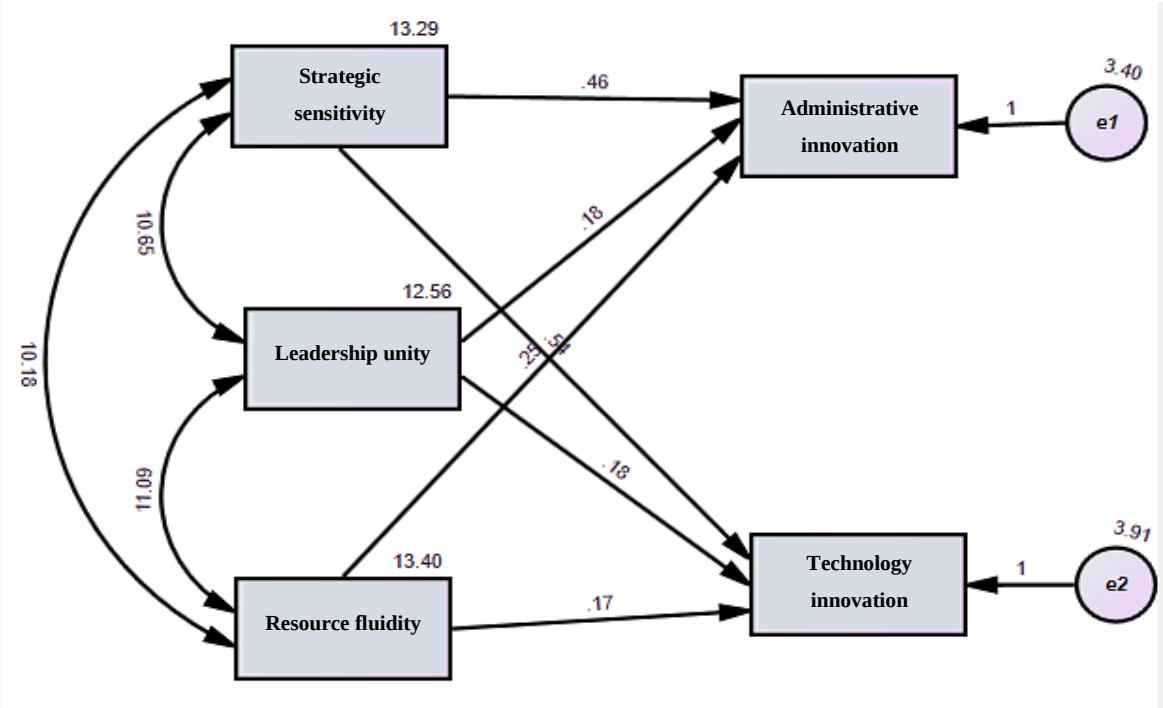

Figure 15: Impact of strategic agility on firm innovation

4.10.6. Four Main Hypothesis

H4: Strategic Agility Has a Mediation Role in The Effect of Top Management Team Behavioral on Firm Innovation.

Figure 4.15 shows that there is a positive and significant effect of strategic agility has a mediation role in the effect of top management team behavioral on firm innovation, as noted that the value of the standard impact coefficient of the effect of the strategic agility on top management team behavioral has reached (0.80), and this means that the strategic agility affects the top management team behavioral by (80%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the strategic agility in the study sample company will lead to a change in top management team behavioral by (80%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-34) is (20.544) it is a significant value at a significant level of (0.000).

The value of the standard impact coefficient of the effect of the strategic agility on firm innovation has reached (0.41), and this means that the firm innovation effects on the strategic agility by (41%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the strategic agility in the study sample company will lead to a firm innovation by (41%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-34) is (11.245) it is a significant value at a significant level of (0.000).

The value of the standard impact coefficient of the effect of the top management team behavioral on firm innovation has reached (0.22), and this means that the top management team behavioral affects the firm innovation by (22%) in the oil firms in Erbil, the sample of the study. This means that changing one unit deviation from the of the top management team behavioral in the study sample company will lead to a firm innovation by (22%). This value is considered significant because the value of the critical ratio (C.R.) shown in Table (4-34) is (5.989) it is a significant value at a significant level of p-value (0.000).

Table 42: Parameters and Pathways of the impact of top management team behavioral on firm innovation by mediating role of strategic agility

PATHS			STD. Regression Weights	Estimate	S.E.	C.R.	P-value	Result
Strategic Agility	<---	**Top management Behavioral**	.814	.800	.039	20.544	***	accepted
Strategic Agility	<---	**Firm Innovation**	.606	.411	.037	11.245	***	accepted
Top Management Behavioral	<---	**Firm Innovation**	.323	.223	.037	5.989	***	accepted

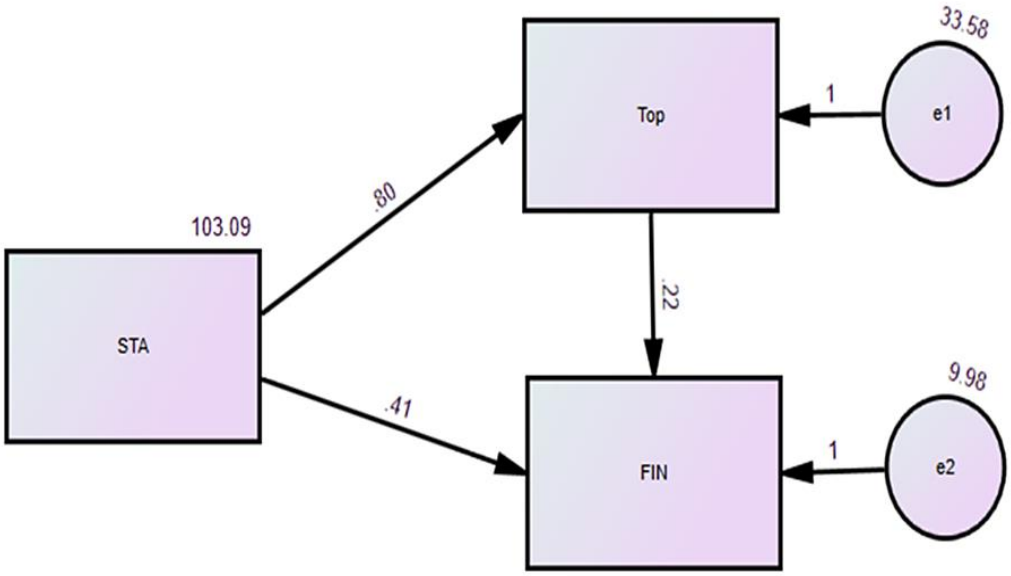

Figure 16: Impact of top management team behavioral on firm innovation by mediating role of strategic agility.

The appropriate decision can be determined about the extent to which the main and sub-hypotheses are supported or rejected in light of the results achieved from testing them, as shown in Table (4-35).

The Main and sub-hypothesis as the following table shows only two sub-hypotheses reject, and they are Information Exchange with Technology Innovation and resource fluidity because the P-value is (0.179,0.488) is greater than (0.05) that why we reject these two sub- hypotheses, and we accepted the others.

Table 43: Decision to support and reject the hypotheses.

	Hypothesis	Decision	Std. Regression Weights	P-Value
H1.	top management team behavioral has positive effect on firm innovation	Supported	.323	***
H1a.	participatory behavior has positive effect on administrative innovation	Supported	.503	***
H1b.	participatory behavior has positive effect on technology innovation	Supported	.324	***
H1c.	Information exchange has positive effect on administrative innovation	Supported	.213	***
H1d.	information exchange has positive effect on technology innovation	Rejected	.128	.179
H1e.	participation in decision making has positive effect on administrative innovation.	Supported	.500	***
H1f.	participation in decision making has positive effect on technology innovation	Supported	.505	***
H2.	top management team behavior has positive effect on strategic agility	Supported	.814	***
H2a.	participatory behavior has positive effect on strategic sensitivity	Supported	.081	***
H2b.	participatory behavior has positive effect on leadership unity	Supported	.184	***
H2c.	participatory behavior has positive effect on resource fluidity	Supported	.276	***
H2d.	informative exchange has positive effect on strategic sensitivity	Supported	.335	***
H2e.	informative exchange has positive effect on leadership unity	Supported	.235	***
H2f.	informative exchange has positive effect on resource fluidity	Rejected	.071	.488

H2g.	participation in decision making has positive effect on strategic sensitivity	Supported	.427	***
H2h	participation in decision making has positive effect on leadership unity	Supported	.372	***
H2i.	participation in decision making has positive effect on resource fluidity	Supported	.435	***
H3.	strategic agility has positive effect on firm innovation	Supported	.606	***
H3a.	strategic sensitivity has positive effect on administrative innovation	Supported	.474	***
H3b.	strategic sensitivity has positive effect on technology innovation	Supported	.541	***
H3c.	leadership unity has positive effect on administrative innovation	Supported	.178	***
H3d.	leadership unity has positive effect on technology innovation	Supported	.177	***
H3e.	resource fluidity has positive effect on administrative innovation	Supported	.256	***
H3f.	resource fluidity has positive effect on technology innovation	Supported	.173	***
H4.	strategic agility has a mediation role in the effect of top management team behavior on firm innovation	Supported	.581	***

CONCLUSION

Conclusion based on analytical data:

In conclusion, enhancing firm innovation through strategic agility is of great importance to firms, especially in the highly competitive oil sector in Erbil city. The top management team plays a significant role in driving this process by promoting a culture of innovation, encouraging risk-taking, and promoting a collaborative work environment.

Conclusion

- In the result of this study found that the behaviors of top management teams have a positive effect on firm innovation in oil firms in Erbil. The positive effect relationship between the independent and dependent variables made it evident that there is harmony between the variables, which has a favorable impact on the research's overall. Through a participative behavior and information exchange and participative in decision making, it was clear that these behavioral aspects, with varying degrees, have an impact on the orientation towards innovation and internal communication that facilitated innovation within the companies. Also, this study result has revealed that top management team behavioral has a positive impact on innovation in oil firms in Erbil.

Through the survey of 216 members of top management teams of the companies' study sample by using Pearson correlations between top management team behavioral and firm innovation (0. 816), that is mean that the first hypothesis accepted and by using the Test of Paths Analysis for all the dimensions , and to getting the result of testing of sub hypothesis of top management team behavioral are significant and has positive effect on dimensions of firm innovation by the critical ratio (C.R.) (1.598 ,2.241,2.334 ,5.930,5.746) that is mean that According to the aforementioned, this relationship can be explained by the fact that the oil companies in Erbil, the research sample, place a strong emphasis on the spirit of cooperation and harmony in order to provide top-notch services and raise the level of administrative activities supporting the activities of primary focus, which in turn strengthens the efforts of departments in raising the level of innovation of companies, Innovation frequently faces less opposition in companies that promote participatory behavior, The exchange of information facilitates the

identification of possible dangers and the creation of creative administrative solutions to lessen them, only the information exchange which has a negative effect on technological innovation with C.R (1.342) according to the respondent form survey sample , the reason behind that is The potential loss of important intellectual property is one of the main effects of information exchange on technological progress in Erbil's oil firms. When members share information, there is always a chance that proprietary information could be leaked or used improperly by rivals or other parties. Deterring businesses from investing in novel technologies or goods might stifle innovation, sharing sensitive information may also have legal repercussions because businesses could be held responsible if their intellectual property is misappropriated. Overall, information exchange may carry hazards that outweigh any potential benefits, necessitating Erbil's oil businesses to take further precautions. participation in decision-making positively influences administrative innovation by encouraging problem-solving, enabling swift change, and fostering a pleasant workplace atmosphere. This collaborative strategy is helpful in handling the changing environment, Participation in decision-making guarantees that technology projects are in line with the oil company's overarching business objectives and plans.

According to the results of the second hypothesis It is obvious that top management team behavioral is crucial for fostering strategic agility in the Erbil oil sector. The study has demonstrated that TMT behavioral can boost companies' capacity to respond to changes in the market environment, build a culture of innovation and creativity, and favorably influence the formulation and implementation of plans that are in line with market needs. Therefore, firms involved in the Erbil oil sector ought to concentrate on enhancing TMT behavioral by fostering an open and transparent culture, fostering employee empowerment, and spending money on leadership training courses. Through the survey of 216 members of top management teams of the company's study sample by using Pearson correlations between top management team behavioral and strategic agility (0.814) that is means the second main hypothesis accepted, and by using the Test of Paths for all the dimensions , and to getting the result of testing of sub hypothesis of top management team behavioral are significant and has positive effect on dimensions of strategic agility by the critical ratio (C.R.) (2.011, 2.058, 3.04, 3.687, 2.322, 0.694, 5.089, 3.974, 4.591) all the sub hypothesis accepted and Participatory behavior enhance strategic sensitivity through encouraging group consciousness,

matching deeds to company objectives, and encouraging flexibility in the face of change, participatory behavior enhance leadership unity by building unity and trust in order to provide united leadership direction and effectiveness, Participatory behavior enhances resource fluidity through encouraging cooperative resource allocation and use, maximizing effectiveness and flexibility, there is a significant effect of Information exchange on strategic sensitivity by offering perceptions, coordinating activities, and improving flexibility in response to shifting outside circumstances, Information exchange promotes leadership unity bringing leaders together and building unity to enable well-coordinated decision-making and strategic guidance, expect (information exchange has positive effect on resource fluidity) rejected explanation of that The test results for the investigation information exchange and resource fluidity in Erbil oil companies produced some intriguing outcomes. The calculated test revealed that increased information sharing within the top management team had a detrimental impact on resource fluidity. This shows that an abundance of information can cause confusion and decreased production in the oil industry. Oil corporations may see some information or resources as strategic assets that provide a competitive edge. Businesses may restrict information sharing in an effort to keep control over these resources and stop others from learning from their mistakes or obtaining vital skills. However, more investigation is required to fully comprehend the mechanisms underlying this link and to create practical mitigation measures for its detrimental consequences on resource flexibility in oil companies, Participation in decision-making enhances strategic sensitivity by encouraging awareness, flexibility, and cooperative alignment across oil companies, Participation in decision-making fosters leadership unity through a common goal, and well-executed decisions , participation in decision-making procedures within Erbil's oil industry fosters cooperation, openness, and flexibility. This encourages constructive resource fluidity, which promotes efficient resource allocation and usage and industry innovation.

- The analysis of the study's findings on strategic agility and firm innovation in the Erbil oil firms sheds crucial light on the interrelationship between these two factors. The correlation between strategic agility and firm innovation that has been found to be positive emphasizes the need for businesses to include agility in their plans if they want to stay competitive in the volatile oil sector. The consequences of these findings are especially pertinent in light of the industry's

constant changes, including as shifting laws and fluctuating oil prices. Businesses may better adapt to these changes and spur innovation by using strategic agility to plan effectively, communicate effectively, and react to market needs. These results imply that strategic agility ought to be given priority in future studies.

Through the survey of 216 members of top management teams of the company's study sample by using Pearson correlations between top management team behavioral and strategic agility (0.868), and by using the Test of Paths Analysis for all the dimensions, and to getting the result of testing of sub hypothesis of strategic agility are significant and has positive effect on dimensions of firm innovation by the critical ratio (C.R.) (7.334,8.125,2.209,2.129,3.628,2.372) all the sub hypothesis accepted this mean that the strategic agility through strategic sensitivity , leadership unity, resource fluidity has very strong effect on firm innovation through administrative innovation, technological innovation in firm oil in Erbil, The results of this study obviously show that strategic agility is a key engine of innovation in Erbil's oil sector. Companies in this area will be able to keep ahead of the curve and remain competitive by having the flexibility to adapt to changes in the market and act swiftly in response to new technologies and consumer needs. As a result, decision-makers in the oil sector in Erbil ought to concentrate on building a culture of strategic agility inside their firms, spending money on the tools and resources required to support agility and keeping a close eye on market and sector changes. Undoubtedly, doing so will be essential for businesses looking to innovate, expand, and survive in a sector that is becoming more volatile and unpredictable, Strategic sensitivity increases an organization's awareness of external changes and improves its capacity to innovate and adjust administratively in response to changing contexts, which in turn boosts competitiveness and long-term success, Recognizing and comprehending market trends and technology developments are key components of strategic sensitivity. By empowering firms to synchronize their goals, this knowledge creates an atmosphere that is favorable for technological innovation and competitive advantage, The promotion of harmony and cohesion through leadership unity fosters collaboration and idea exchange, all of which have a good effect on administrative innovation inside the company, A collaborative culture that welcomes risk-taking and a range of viewpoints is fostered by leadership unity, and this helps to create an atmosphere that is favorable to technological innovation and progress in oil

firms in Erbil according to the results , also the results show . Resource fluidity makes it easier to allocate resources nimbly, which encourages experimentation and adaptation and promotes administrative innovation by making effective use of available resources and being flexible, Resource fluidity enables flexible allocation, supporting technology experimentation and adaptation, promoting innovation by optimizing resource use, and fostering technological advancements.

- The study's findings provide persuasive evidence that, in the context of Erbil, strategic agility is essential in mediating the relationship between top management team behavioral and firm innovation. According to the findings, companies looking to improve their innovation performance should work to develop agile strategies that can quickly adapt to environmental changes and ease the adoption of creative ideas. Additionally, it emphasizes the significance of developing an inclusive organizational culture that may promote and reinforce innovative behavior among the top management team. Through the survey of 216 members of top management teams of the company's study sample by using Pearson correlations between top management team behavioral and strategic agility (0.868), and by using the .Test of Paths Analysis for three variable to investigate the impact of mediating variable , and to getting the result of testing of the hypothesis of strategic agility are significant and has positive effect on of firm innovation by the critical ratio (C.R.) (20.544,11.245,5.989) It is clear from this that there is a direct relationship between the variables and its impact is strong and direct it is a significant value at a significant level of p-value (0.000).the effect of strategic agility on the top management team behavioral is positive and significant, and the effect of strategic agility on firm innovation is positive and significant, and also the effect of the of the top management team behavioral on firm innovation is positive and significant and remains at a high level after adding the mediating variable strategic agility. This is evidence and proof of the strength of the influence of the study variables on each other and their importance in terms of application.
- The result show that the most important factor that contributes to firm innovation through top management team involvement is the participative in decision making in firm oil, which obtain a higher degree impact as instrumental in

achieving firm innovation. Team members are more likely to have a sense of ownership over the companies' goals and initiatives when they feel included in the decision-making process.

- Through the results, it was noticed that there is a bias in the sharing of information among the members of the top management team in the oil companies in Erbil, and the reason for this is due to the fear of privacy information that is related to sensitive topics related to the future of the companies.
- The level of innovation of the companies studied in the study sample varies according to the strength of the influence of the dimensions mentioned.
- According to the results the study of the behavioral of the top management team and firm innovation in Erbil reveals that strategic agility is a key mediator of this relationship. The results show that businesses with more creative top management teams can better leverage their innovative behaviors to achieve firm innovation.

Recommendation

The scientific necessity requires completing the research aspects related to the applied conclusions, by presenting a number of suggestion and recommendations that represent mechanisms or proposals that can be relied upon to enhance knowledge, or address field problems related to the researched variables, and the most prominent of them can be clarified as follows:

- Firms cannot nurture innovation without a supportive team atmosphere, participative behaviors, information sharing, and participative strategic decision-making. It is advised that oil businesses make investments in top management teams to cultivate these habits in order to stimulate innovation and succeed in a highly competitive environment.
- In order to recognize and distinguish new development opportunities and make them fully compatible with the requirements of the accelerating external environment in general and the local community in particular, it is essential to emphasize the development and maintenance of the information exchange

process at the level of companies as well as at the level of departments and divisions.

- Top management teams in oil companies need to give share information in a high priority and implement significant improvements. To encourage everyone to contribute without reservation or fear, they must
  - Establishing an open channel for feedback and communication will guarantee that all team members participate in crucial debates that influence the course of the company.
  - In order to enable a fair platform for all perspectives to be heard, management should make sure that diversity and representation are taken into account when choosing team members.
  - Top management needs to give team members opportunity for relevant training and development so they may gain the knowledge and skills they need to improve effectively. To avoid conflicts and maintain responsibility, it is crucial to create clear expectations, roles, and responsibilities. Top management teams in oil companies can promote a culture of collaboration, and boost companies innovation by putting these recommendations into practice.
- Firms in Erbil are advised to put strategic agility first in order to raise the overall degree of corporate innovation. To do this, it would be a good idea to put together a team that is only responsible for looking for new opportunities and creating adaptable business plans. Firms should also encourage top management teams to display traits that foster innovation and creativity, such as being receptive to replacement perspectives and willing to take measured risks. Overall, a dedication to strategic agility can aid Erbil businesses in being innovative and fostering long-term success.
- there are many geopolitical and economic risks in the current oil landscape, making strategic sensitivity essential for oil corporations. Understanding market dynamics, adjusting to change, and taking proactive steps to reduce risk are all part of embracing strategic sensitivity. Building trusting connections with stakeholders, such as governments, investors, and suppliers, is another

requirement. These tactics enable businesses to reduce potential shocks and take advantage of new trend-related possibilities.

- Oil producers in Erbil must keep in mind how crucial it is to strike a balance between economic growth and environmental protection and seek to make sure that oil is produced sustainably. The oil sector in Erbil can succeed and continue to make a substantial contribution to the expansion and prosperity of the region with a comprehensive approach to development.
- In order to keep the leadership of oil companies united, it is crucial to foster a culture of respect and trust among executives. Leaders must foster an environment where mutual respect and trust are highly valued and where people may voice their viewpoints without fear of retaliation. that Erbil's oil companies keep up of market developments and rules and interact with stakeholders to minimize risks and enhance revenue creation. This suggestion can help oil companies maintain resource fluidity and achieve long-term sustainable growth.
- Oil companies will be able to access deeper oil sources that were previously deemed uneconomical because to technical advancements. Oil firms in Erbil can position themselves for long-term success and sustainability in a field that is become more competitive by adopting technological innovation.
- Since technological advances and advancements in the oil industry are always changing, researchers must keep up with the most recent discoveries. Collaboration with business experts and access to cutting-edge research facilities are required for this.
- The study's finding has significant results for decision-makers and business experts who want to encourage innovation in the oil and gas industry in Erbil and elsewhere. Firms can acquire a competitive edge in an increasingly dynamic and complicated business environment by appreciating the need of investing in the behavioral development of the senior management team and promoting an innovative culture.

Recommendation for Future Studies

Based on the findings of the present study, there are several recommendation for future studies.

- To improve the generalizability of the findings, it would be useful to repeat the study with larger samples or in additional industries.
- There are gaps in theoretical framework that need to be filled in by upcoming research. The neglect of the effect of TMT behavioral on various forms of innovation is one of the major gaps. Most studies solely look at product innovation, ignoring organizational and process innovation. Studies that look at how the connection between TMT behavior and innovation varies across industries are also required. Last but not least, future study should examine the mediating and moderating factors that influence the relationship between TMT behavior and innovation.
- Conduct research to monitor changes over time in TMT behavior, strategic agility, and innovation. This may shed light on how long these relationships will last and how they will change.
- More study is required to examine the precise TMT behaviors that can promote strategic agility across a range of markets and environments the correlation.
- According to the literature, top management can be a key factor in fostering innovation inside businesses, but more study is needed to identify the precise mechanisms and circumstances under which this link is valid, which intends to investigate how top management behavior affects business innovation and how strategic agility functions as a mediating factor.
- Future studies could broaden the scope of this study to include additional sectors and regions, enabling a more thorough comprehension of the connection between top management conduct and innovation.
- Future studies on top management team behavior and strategic agility are advised to examine how individual traits like gender and cultural diversity and the complex facets of TMT behavior affect strategic agility.

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LIST OF TABLES

LIST OF FIGURES

APPENDICES

QESTIONNAIRE

UNIVERSITY OF KARABÜK

College of Administration and EconomicsBusiness Administration

Department PHD student

Date / / /

Number of the form ( )

Dear Sir/ Madame Greetings

We would like to take some of your precious time. The questionnaire you are holding in your hands is completed for the purpose of a scientific research described in the PHD thesis titles The Impact of Top Management Team (TMTB) behavioral on Firm innovation Through the Mediating Role of Strategic Agility in Oil firms in Erbil-Iraq. Could you please answer the following questions? All you need to do is to tick (√) the variant of statement that corresponds with your point of view. Note that your answers will be used for scientific purposes only, so we hope for your sincere cooperation.

Thank you.

Yours faithfully,

Main Notes:

- We hope you to read all the questions attentively and reflect over your position carefully.
- There is no correct or incorrect reply; we just need your opinion on the proposed issue.
- Please answer all the questions. If you miss one of them at least, the analysis will be considered invalid.

- Please describe the extent of your agreement to each paragraph ticking (∨) the corresponding box, which gives the needed accuracy and your description of the situation, as the evidence that it really exists.

Section A: Personal data: Please fill in the following data or select the desired statement.

Sequence	Factors	Classification	✓
1	**Gender**	Male	1
		Female	2
		25 - 30 years	2
		31- 40 years	3
		41-60years	4
3	**Educational**	Technical Diploma	1
		Bachelor	2
		Post graduate	3
4	**Position**	Assistant Director	1
		general director	2
		consultant	3
		advisor	4
		Other	5
5	**Service duration**	Less than 15 year	1
		15 years or more	2

SECTION B

Please tick (√) the position in the answer box that reflects your opinion on the issue the most closely the top management team: The level of interaction between the members ofthe top management team is described by exchange. Where the information is provided, is accurate and timely, and is involved in making decisions and the client in a cooperativeway to achieve firm innovation.

(1)	(2)	(3)	(4)	(5)
Strongly Disagree	**Disagree**	**Undecided**	**Agree**	**Strongly Agree**

A. Independent Variable (Top Management Team Behavioral) (Najah, 2014).					
1. Participative Behavior					
1. When a firm board member is busy with something, he takes the initiative other members to help him lighten his burden.	1	2	3	4	5
2. The flexibility of the faculty council members makes their work even more ease.					
3. Firm board members are willing to help each other with complex tasks.					
2. Information Exchange	1	2	3	4	5
1. The ideas exchanged between members of the firm board are of good quality					
2. The solutions proposed by the members of the firm Council for the problems presented are very good and realistic					
3. The mutual dialogue between the members of the corporate board results in the presentation of innovative and creative ideas.					
3. Participation In Decision- Making	1	2	3	4	5
1. firm board members are powerful to keep each other informed of activities that affect their work					
2. The members of the firms Council have a clear awareness of the difficulties that arise as a result of the Council's activity as well as the needs of its members.					
3. Firms board members are keen to discuss and not ignore the ideas and expectations of other members.					
B. Mediating variables (Strategic Agility) (Reed, 2020)					
1.Strategic Sensitivity					
1. My firm anticipates future customerneeds.	1	2	3	4	5
2. My firm recognizes the need to trynew business models					
3. My firm adopts new ways of doingbusiness from other companies.					
2.Leadership Unity	1	2	3	4	5
1. The managers are aligned around a common interest through a compelling mission, aspirational vision, shared					

values, and emotion.					
2. The managers of operate as an integrated, interdependent, value-creating team.					
3. The leaders of my organization reveal their underlying motivesincluding aspirations, biases, and fears.					
3.Resource Fluidity	1	2	3	4	5
1. Resources in firms are easilyaccessed across firm's boundaries.					
2. The elements of my organization(e.g., departments, lines of business) are loosely coupled and flexible.					
3. In the firm underlying business systems and processes are modular andeasily changed.					
C. Dependent Variable (Firm Innovation) (**Abdel Wahab, B. (2012).** **1. Administrative innovation.**					
1. The company has introduced radical changes in its organizational structures.	1	2	3	4	5
2. The company made extreme changes in the use of computer systems in its administrative operations.					
3. The company introduced new policies in the area of recruitment, bonuses and incentives.					
2. Technological innovation.	1	2	3	4	5
1. The company has made changes in the design and delivery of its services in line with the quality of modern technologies.					
2. The company has devised new ways to build, modify and improve its service operations.					
3. The company has introducednew technologies to improve its services compared to competitors.					

CURRICULUM VITAE

Shno Noori Ahmed DZAEE. She holds a bachelor's degree in business administration in Erbil, Iraq, and a master's degree at Gaziantep University in Turkey, specializing in business administration, and began her doctoral studies in business administration at Karabuk University in Turkey.