The Impact of Artificial Intelligence Techniques in Chameleon Leadership: An exploratory study of the opinions of a sample of senior and middle management in a group of private banks in Babil and Diwaniyah Governorates

Firas Adnan Abbas	Ahmed Hameed Kareem	Sarmad Sami Shammran	Ahmed Firas Adnan
Firas.a.abbas@qu.edu.iq	Ahmed.ha@albayan.edu.iq	Sarmdsami290@gmail.com	Af22099@auis.edu.krd
University of Al-Qadisiyah	Al-Bayan University	University of Al-Qadisiyah	American University of Iraq

Corresponding Author: Firas Adnan Abbas   Ahmed Hameed Kareem   Sarmad Sami Shammran   Ahmed Firas Adnan

Abstract : The current study addressed one of the most important issues facing organizations with chameleon or changing leadership behavior, which is the lack of full benefit from the applications of artificial intelligence techniques. The main research problem was to understand the impact of applying artificial intelligence techniques in the management of organizations with chameleon leadership, and the extent of the contribution of artificial intelligence applications in diagnosing and addressing administrative and technical obstacles in strategies and leadership with the aim of achieving high performance. In this context, the main objective of the study was to build a conceptual framework for the application of artificial intelligence techniques in chameleon leadership behaviors, specifically in the organizations of the research sample. To achieve the objectives of the study, the researcher followed the descriptive method with the analytical approach that suits the nature of the problem. An exploratory study was also conducted on the research sample using a questionnaire as a tool for data collection. The study concluded with the development of a reliable scale for the application of artificial intelligence techniques in organizations with chameleon leadership. Artificial intelligence techniques consist of two dimensions: (expert systems, and neural networks), while chameleon leadership consists of two dimensions represented in (external control, and relativistic beliefs).
_____

Keywords: Artificial intelligence techniques, Chameleon leadership.

Introduction: The increase in the diversity and complexity of operations, especially under the great expansion in the activities practiced by organizations, including universities, has led to increased pressures on them to adopt methods and tools that include the use of approaches to achieve high levels of performance. And because achieving that requires these organizations to monitor and control their performance, this requires the organizations to use artificial intelligence techniques to improve their outputs. Since the different programs and specializations provided by organizations under great development are among the most important programs that need quality assurance and continuous development in order to improve them, because of their special importance in the advancement of organizations, survival, and increased growth. The application of artificial intelligence techniques leads to strengthening the future of these organizations. With the recent spread of artificial intelligence, organizations are working on transforming not only their organizational design but also the operational input and output processes of the recruitment process. Artificial intelligence techniques provide a great advantage by improving their strategies and tasks and expanding the diversity of the workforce group. However, this expansion does not necessarily equal an increase in the quality of performance. In addition, what is seen in practical practice is that artificial intelligence techniques in talent acquisition provide a delicate balance between the strategy and leadership that organizations use and advanced technologies. This balance creates an effect in control and beliefs. Artificial intelligence techniques play a role in the process of talent acquisition. We claim that the recent spread of artificial intelligence techniques within organizations transforms not only the organizational design but also the operational processes of all operations and strategies.

First Topic: Research Methodology

First: Research Problem

The researcher followed a systematic approach in defining and diagnosing the research problem in this study, relying on the results of similar previous studies, as well as professional and field experience, in addition to conducting an unstructured field survey in the research sample, in order to identify the most important obstacles and difficulties

facing organizations in improving their performance and achieving competitive advantage to become pioneering organizations. The researcher concluded that there is a clear shortcoming in the use of artificial intelligence techniques in all aspects of the departments of the organizations in the research sample, in addition to the absence of highly specialized and advanced computer systems in application software, and the way they work in the form of cells that evaluate inputs and estimate weights. Despite technological development in various fields, there is still a deficiency in the use of artificial intelligence techniques and their applications such as expert systems and neural networks. The absence of technical knowledge and sufficient experience in using the computer to carry out a specific task makes the use of modern techniques in carrying out this task difficult and complex.

In light of the above, the current research attempts to find successful solutions to overcome these obstacles by harnessing the power of artificial intelligence techniques to enhance and develop the performance of the departments of organizations and ultimately transform them into high-performance organizations. Based on the above, the research problem can be formulated in the following main question:

To what extent are artificial intelligence techniques used in exploring and analyzing the impact of achieving chameleon leadership?

● Q1: How do artificial intelligence techniques affect the leader's ability to adapt and change his leadership style (chameleon leadership)?

● Q2: What are the opportunities and challenges associated with using artificial intelligence to enhance chameleon leadership?

Q3: What are the most prominent artificial intelligence techniques that can affect leadership practices?

Second: Research Objectives

The research into artificial intelligence techniques is proving to be very relevant, when examining the chameleon leadership style in today's companies. Coming from the research questions, this study will set out to see how AI is affecting the way chameleon leaders operate, and ask the people who are being studied what they think of the use of AI. Based on the research questions, this study seeks to achieve the following objectives:

1. One of the main things the study will be doing is identifying the level of impact that AI is having on achieving chameleon leadership.

2. To determine the level of perceptions of the research sample regarding the use of artificial intelligence techniques.

Third: Research Significance

Our research has given theoretical and practical suggestions to how leaders can use AI to make themselves more adaptable and agile, and puts into the spotlight the brand-new set of skills that managers need in the AI age. AI techniques and chameleon leadership are relatively modern ideas in the world of contemporary management, both on the theoretical and practical levels. The discussion and dialogue around these topics continue, especially as developments and innovations in AI and leadership are ongoing. Therefore, studying these two topics and linking them in research is of great importance from the researcher's perspective. For this reason, they are addressed together, and the significance of the study can be summarized in the following aspects:

1. The current research extends previous studies that focused on artificial intelligence techniques in general, adding to the academic accumulation in the field. It aims to understand the applications of AI techniques in the organizations of the research sample, which are rarely studied or attempted to be applied in a changing environment. The novelty in addressing the topics of artificial intelligence techniques and chameleon leadership together in the private   sector.

Identifying the foundations, principles, and requirements necessary to utilize artificial intelligence techniques as investment-oriented tools that can be employed to advance organizations relying on top management leadership.

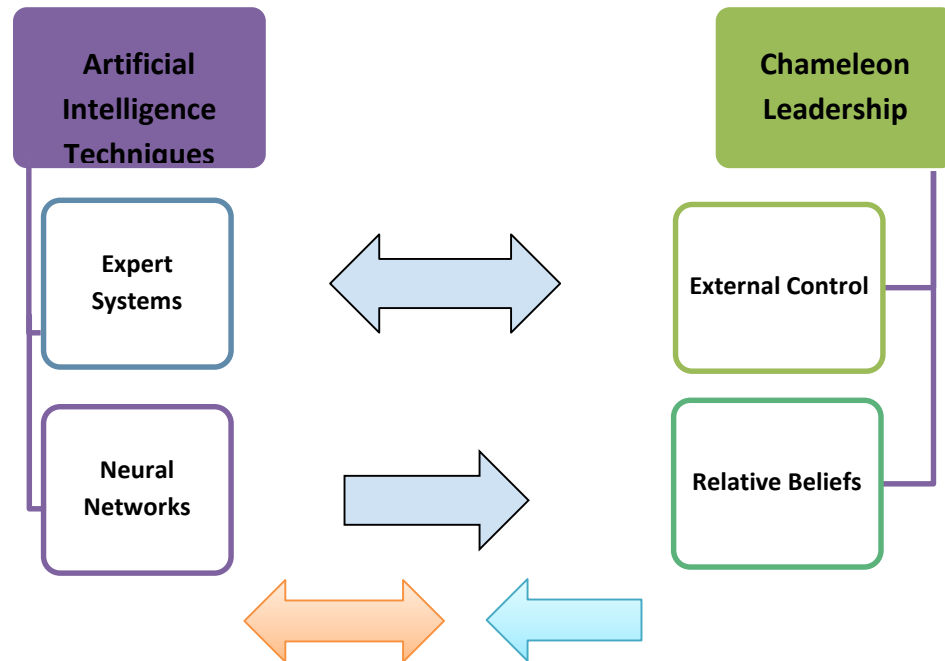**Fourth: Research Hypothetical Framework**

Figure (1): The Hypothetical Framework of the Research

Fifth: Research Hypotheses

The research includes two main hypotheses: the first relates to correlation, and the second pertains to direct effect, as follows:

First Main Hypothesis: There is a statistically significant correlation between artificial intelligence techniques and their dimensions and chameleon leadership. From this, the following sub-hypotheses arise:

1. **First Sub-Hypothesis:** There is a statistically significant correlation between the expert systems dimension and chameleon leadership.

2. **Second Sub-Hypothesis:** There is a statistically significant correlation between the neural networks dimension and chameleon leadership.

Second Main Hypothesis: Artificial intelligence techniques have a statistically significant effect on chameleon leadership. From this, the following sub-hypotheses arise:

1. **First Sub-Hypothesis:** There is a statistically significant effect of the expert systems dimension on chameleon leadership.

Second Sub-Hypothesis: There is a statistically significant effect of the neural networks dimension on chameleon leadership.

Sixth: Research Population and Sample

The population consisted of 200 individuals working in the senior and middle management of a group of private banks in Babil and Diwaniyah Governorates. A comprehensive survey method, known for its accuracy and high credibility, was used. The researcher distributed 200 questionnaires to managers, assistants, and heads of departments and branches within the research population. Out of these, 185 questionnaires were returned. After reviewing the returned questionnaires, it was found that 21 were invalid for statistical analysis. Therefore, the researcher relied on 179 valid questionnaires for the analysis.

Chapter Two

Theoretical Framework

First: Artificial Intelligence Techniques

1- Concept of Artificial Intelligence Techniques

The term "Artificial Intelligence" was first introduced at Dr. Art Mouth's seminar in 1956, and since the introduction of this term, researchers have worked on developing a set of principles and theories, expanding this concept. The essence of artificial intelligence "is the simulation of the thinking process to acquire information, and the simulation of human thinking can be implemented in two ways: first, structural simulation, which can imitate the structural mechanism of the brain and create a machine similar to the human brain." The second type is called functional

simulation, which simulates the functional aspect and temporarily leaves the internal structure of the human brain (Collins et al., 2021:7).

Artificial intelligence relies on the development of modern systems through which data is stored in the computer to create a primary database for this science, in the same way it is stored in the human mind based on daily learning and acquired experience. Then, specialized programs are developed that allow the computer to use this data logically when dealing with decision-making problems. Examples of artificial intelligence include robots and personal computers that interact with humans, execute voice commands, and other applications (Kumar et al., 2023:230). Researchers view artificial intelligence techniques as a branch of computer science that depends on designing intelligent systems capable of performing tasks carried out by humans in a similar manner, approximating the known characteristics of human intelligence in behavior. The principle of operation in artificial intelligence relies on matching patterns that can be formed by describing objects, events, and processes using their attributes and logical and computational relationships (Laszlo, 2019:4; Hmoud).

Artificial intelligence techniques are considered one of the ways of thinking (algorithms) that enable the computer to solve problems, relying on intelligent computer programs and systems programmed in one of the programming languages, represented in the computer memory and capable of simulating human intelligence. Most of these programs write and represent data, and the language performs search operations (Paschen et al., 2020:149). Artificial intelligence techniques are defined as a set of digital processes that simulate human intelligence. The adoption of various artificial intelligence applications by sports organizations has contributed to faster and easier interaction with beneficiaries, expanding this base to include large numbers of beneficiaries around the clock. "Expert systems, artificial neural networks, genetic algorithms, intelligent agents, simulation systems, robots, and automation have replaced human resources" (Pothen, 2022:2).

Artificial intelligence techniques are also defined as the ability to represent computational models in various fields, identifying the fundamental relationships between their elements, and then tracking the responses suitable for events and situations in that field. In other words, artificial intelligence techniques are the ability to create advanced models that humans are capable of inventing and developing (Guzman & Lewis, 2020:3).

2- Importance of Artificial Intelligence

Artificial Intelligence plays a crucial role in helping companies operate in a complex and competitive environment, where significant pressures exist to survive in the market. In terms of customer retention, the main elements of satisfaction, trust, commitment and perceived value are the backbone of a company's success in today's market. In today's landscape, companies such as Google, Facebook and Apple, using their major data-driven approach, show that continuous focus on customers and modern technology can flip the way standard services are done.

Artificial intelligence is now being regarded as the game-changer in the market that has the capacity to upend traditional markets and has been welcomed as an innovative tool. By using today's cutting-edge technologies, companies can create more adaptable and agile structures and processes that result in better customer service, cut costs and accelerate innovation (Valavanidis, 2023:3).

Decision-makers can operate more efficiently as the AI gives them the space to do so, when using artificial intelligence. Coming hotfooting back and forth between checking on the AI and other tasks is no longer necessary. AI can quickly sort out the mundane tasks, such as data entry, analysis, organisation and updates, freeing up time for human beings to concentrate on things that need a human touch. Now, people can pour their energy into interpreting the results, checking how they stack up against real-world situations and then making decisions (Pothen, 2022:4).

When it comes to high-performance organisations, AI has the ability to help private and public entities and their staff reach new heights, and that's the reason why these organisations are constantly on the lookout for AI solutions that can fuel their progress. Coming from the perspective of a high-performance organisation, the goal is to outdo the competition and satisfy customers' needs, and with the aid of AI applications these results can be guaranteed. Hence, as a result, there is a growing reliance on AI to foster development (Ionescu, 2019:6).

Artificial intelligence is the way to go, and companies are weighing the benefits of using AI in the hiring process, when boosting operational performance. However, deploying AI in a way that doesn't sacrifice the human touch is a challenge, and in the realm of talent acquisition, this is especially true. Commonly referred to as chatbots, these software applications simplify text and voice communications, and can pose a risk if we don't make sure they don't replicate or exacerbate existing prejudices. For years, chatbots have been used to provide customers with a quick way to get answers, or learn about what is on offer. For speeding up transactions, AI plays a big part by taking over tasks such as document review. By doing so, it not only reduces costs, but also the time that people wait (Zhang et al., 2020:1).

3- Dimensions of Artificial Intelligence

A. Expert Systems

In relation to artificial intelligence, expert systems are one of the most notable contributions to the field, and are essentially a field where computer programs can be given a vast, structured body of knowledge. These systems can be seen as highly advanced software applications that are built from the ground up to deliver very specialized and precise functions. Expert systems are employed in planning and designing projects, the allocation of operational resources, the prioritization of customer requests and the monitoring and control of processes. The defining feature of expert systems is their capability to capture the expert knowledge within any given domain. With the goal of mimicking the expert's performance to a remarkable level, and their ability to learn can lead them to automate these processes to the level of exceptional speed.(Obaid et al., 2023:4).

Expert systems are also defined as computer software systems that replicate expert procedures used to solve complex problems. Through these systems, expert knowledge is transferred to the expert systems so users can benefit from it in problem-solving (Alshadoodee et al., 2022:3581). Expert systems are described as knowledge-based information systems that use specialized and complex applications of knowledge, transforming them into advisory experts for end-users. Their primary purpose is to assist humans in the thinking process rather than merely providing information, thereby making humans wiser and more knowledgeable (Khanzode & Sarode, 2020:6).

Expert systems are also defined as the process of knowledge engineering, where the knowledge possessed by experts is programmed into computer systems to accomplish tasks. Additionally, it is considered an engineering science used in creating intelligent machines, particularly in the development of intelligent computer programs (Rospigliosi, 2023:2).

B. Neural Networks

Neural networks are considered one of the most important specialized applications in artificial intelligence. They are an essential and suitable tool for solving problems related to pattern classification and recognition. Operations are conducted through connections, processing units, and links that form computational elements called neurons or nodes. They are termed "neural" so that this information can be made available to users (Botega & da Silva, 2020:1113).

Neural networks are defined as a group of nodes that operate collectively by performing specific types of computations. Each node is represented as a small standard computational unit that operates in parallel, relying on interactions among them. Networks are mathematical models formulated as diagrams or as a simple algorithmic entity that mimics the features found in computer systems that process information and provide solutions to complex problems in a parallel manner through simple components called neurons (Shuford & Islam, 2024:3).

Neural networks are also defined as a method that mimics the functioning of the human brain, referred to as artificial neural networks. They weigh and sum them up and then compare this sum with the initial input, when neurons are fed with inputs. If the sum is satisfactory, the neuron takes its decision, otherwise, it doesn't, and is able to change how it works so that it will understand the input better next time (Khaleel et al., 2023:6).

For understanding neural networks, the mind goes back to the idea of a network of nerves that operate at different levels, think of a stack of layers. Coming from the top down, the basic functioning of the network is largely dependent on how well it learns and connects its component parts (Nyholm, 2024:79). As we talk about neural networks we're referring to systems that mirror the way our nervous system processes information. At the heart of these networks is a highly interconnected architecture that's built to solve problems. Just like the human nervous system, the strength of the connections between individual components in these networks changes in response to shifting input patterns, the results, or in some cases, both (Sujata et al., 2019:704).

Second: Chameleon Leadership

1- Concept of Chameleon Leadership

Organisations are now required to throw away traditional methods of leadership and instead go with something new. Chameleon leadership, when facing the complex and diverse challenges in the fast-paced modern environment. Coming hotfooting into the scene, chameleon leadership is regarded as the best way for companies to navigate and succeed in situations of high uncertainty, and its goal is to prevent the pitfalls that arise when a business doesn't have the competitive edge it needs to get ahead. Chameleon leadership is basically the ability of an organisation to "disguise" itself, having the qualities that allow it to merge with the people it's working with, both inside and out, in order to stay afloat in a world that's changing rapidly (Federico, 2019:3).

Chameleon leadership is defined as the ability of individuals to change their behavior, helping them adapt to rapidly changing environments to achieve desired goals (Hamdoon, 2021:6). The term "chameleon" is often used to describe a behavior, not a fixed personality, and can be a very valuable asset in the right settings, when referring to a person. Chameleon leadership is basically a set of characteristics that help someone integrate perfectly into their environment. Coming from a leadership perspective, a chameleon is able to change its behavior and adapt to the surroundings, basically to get what they want done (Agung et al., 2021:71).

Speaking of the way leaders operate in an organisational setting, the term chameleon leadership is often used to refer to the ability to be adaptable and flexible in the face of changing needs. Coming from a darker side, this sort of leadership is characterised by the way that some leaders will do whatever it takes to stay in power and thrive, without even considering the survival of their colleagues. This behavior influences managers to impose their personal style on subordinates (Abbas, 2024:24). Chameleon leadership is depicted as the ability to adjust tactics, much like a chameleon, to enhance innovative behavior within the organization. It explains the interrelationships among these variables and theoretically examines the cognitive psychological mechanisms that may relate to the effects of external control, relative beliefs, and job security on innovative behavior (Abd Alhosine & Mahmood, 2022:282).

Chameleon leadership is also defined as the ability to change behavioral approaches and adapt to new situations to achieve personal objectives. By adapting easily to the needs of each specific circumstance, flexible leaders are able to lead in diverse ways. Adaptive leaders are described as those capable of quickly adjusting to new situations in most cases (Massoudi, 2022:3). Furthermore, chameleon leadership is defined as a set of varied behaviors employed by leaders, similar to the behavior of a chameleon, to align with a disrupted and changing business environment for survival, growth, and achieving superiority over other organizations (Alabadi & Al-Khakani, 2021:99).

2- Importance of Chameleon Leadership

Chameleon leadership increases the ability of individuals or teams to handle complex and adaptive problems. It addresses and responds to critical issues by identifying and describing internal tensions. This is achieved by applying different leadership styles to accomplish higher objectives generated by the urgent need for activities that provide a competitive advantage, which is essential for organizational survival. When it comes to leadership, Chameleon leadership is the ability to mould one's leadership style to the task at hand, and is in part determined by the nature of the team being led, and the jobs they assign to the leader. Coming hotfooting into a new problem or situation, this adaptable approach is perfect for tasks that need different kinds of leadership, and yet has a very clear set of rules (Pisani, 2019:3). With respect to leadership, Chameleon leadership presents a pragmatic approach that involves adopting the effective practices and attributes of other skilled individuals in the organization. This phenomenon is more prevalent in companies where there is a wide cross-section of diverse, skilled, and influential employees and is more of a reality in high-performing facilities. This leadership concept not only shields organizations, especially in business facilities, from getting involved in situations that might hinder transformation, as such cases. It makes use of techniques that to inhibit bickering between leaders and their teams. The attitude of the leader, being so key in this area, has a ripple effect on how staff interact with each other. The knowledge and expertise of experienced workers significantly impacts Chameleon leadership behavior in various facilities, where such techniques ensure that there are few to no conflicts between either, employees and their colleagues or the employees and their leaders. (Lei et al., 2023:72).

Chameleon leadership can be the way to go, and that's especially true in situations where immediate action is necessary, when a business needs a change. Coming hotfooting into a department and totally rearranging it to give the public better services is no easy task, and can be mind-bogglingly complex, but chameleon leadership makes this kind of transformation possible. What it does is to shake up the whole company culture and get people pumped up, producing brand-new leaders who are completely committed and capable. It's all about reinventing what's needed to create, put into practice, and measure brand-new ideas. Well-known as the sort of leadership that responds to the shifting landscape, chameleon leadership is basically the answer to the problem of organisational stagnation, and it won't work unless there is communication and teamwork between the top brass and their team members. Companies look to their leaders to show the way, and inspire their workers to come up with innovative ideas. (Fawzi, 2018:107). The leadership of Chameleon conveys a vision for organizations and employees clear. Leaders in these organizations communicate a vision aligned with company values and employee values creating a shared sense of purpose which motivates employees to pursue their goals. It encourages the young people to work diligently knowing that their positions are secure. (Harris & Simons, 2020:4).

3- Dimensions of Chameleon Leadership

A – External Control

Individuals are often required to adapt to external world, whereas principles can sometimes be subjective, when making decisions. This leads to the personality trait of chameleon, as it becomes necessary to shape-shift to fit the surroundings. The characteristics that come with chameleon leadership, make it dangerous to become less committed to our chosen values in the moment we change people's surroundings. Seeing or even just hearing about the behaviours, qualities or beliefs of others causes people to feel as though they're meant to be just like them, and this can be very hard to shake off. The chameleon's habit of looking around to figure out what to do, is basically an approach that involves checking in with the people you're dealing with to decide the best course of action, and coming up with decisions that go along with what others want (Fayyad, 2022:187).

When discussing the extent to which we think we can control the events and outcomes in our lives, we can say that people with external control believe that fate, luck and destiny run the show. They tend to avoid taking ownership of their decisions, and instead rely on the situation they're in to figure out what to do next. Coming hotfooting into other people's lives isn't really their thing either, and they don't worry about how their behaviour is affecting others, as long as they get what they want (Sultan & Alhadrawi, 2015:191).

Looking at a person's external control, we see how much they believe they can control the things that happen in their life. Coming from a position of external control, individuals tend to think that luck or destiny plays a huge role in the decisions they make and the outcomes they get, and as a result, they often don't take full responsibility for their actions (Abd Alhosine & Mahmood, 2022:278).

B – Relative Beliefs

Relative beliefs are the cultural and social norms of the society and culture to which one belongs. Relative believers accordingly believe that moral actions and judgments are a result of traditions, social and cultural norms, individual tastes, and habits. Besides, they believe that ethical choices are a function of the environmental conditions around them and can adhere to moral principles which give priority to personal self-interest over the rights of others. Therefore, they are likely to exhibit unstable traits and indulge in self-gains at the expense of others due to a lack of ethical base. Therefore, relative beliefs will most likely lead to unethical choices (Alabadi, 2018:6). Evaluating right and wrong, many people adhere to the concept of relative beliefs. Coming from a position of cultural, societal and self-interest norms can cause individuals to question the 'rules of the game', and more often than not, the want for personal gain can cloud the line of what is fair and ethical. It is usually because there isn't a set of principles that stands in the way of this behaviour, and that the idea of ethics is controlled by what is around us.(Durrah & Kahwaji, 2023:257).

Chapter Three

Practical Aspect

First: Verification of Data Distribution Test

By employing the use of a data test in order to make conclusions, an understanding of the type of distribution of the data is necessary. The test was used for the normal distribution of each variable separately. For normal distribution, parametric tests are utilized; and in case the data are not normally distributed, non-parametric tests are utilized, as described below:

A. Data Distribution Test (Artificial Intelligence Techniques Variable)

In order to test whether data for the variable "Artificial Intelligence Techniques" are normally distributed, the Kolmogorov-Smirnov test has been used. Table (1) and Figure (1) illustrate the data distribution. The test result indicates that the variable "Artificial Intelligence Techniques" significance level is (0.079), which is greater than the statistical significance level of (0.05). This indicates that the test is not statistically significant, meaning the variable "Artificial Intelligence Techniques" is normally distributed and can be examined using parametric statistics.

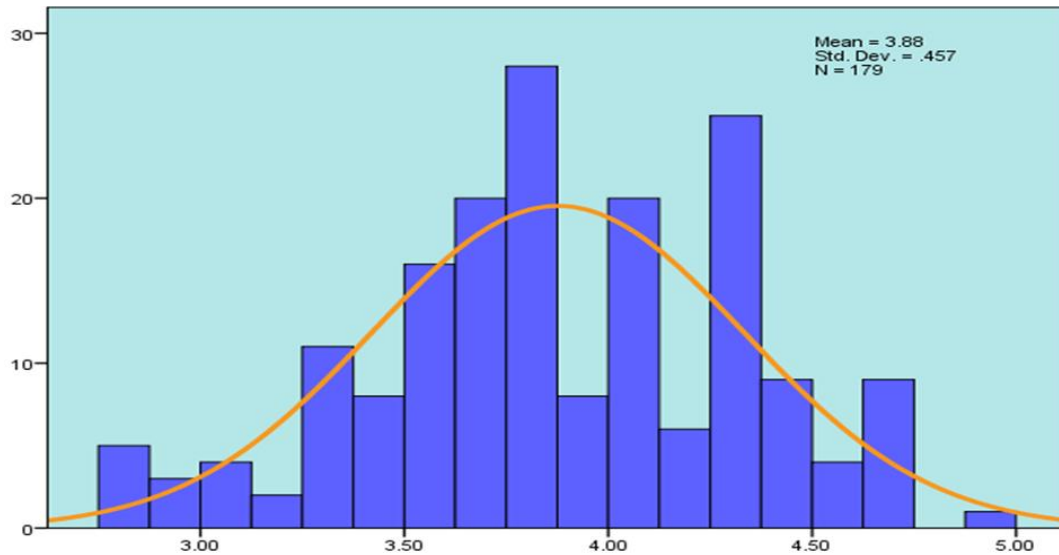| Table (1) Data Test for the Variable "Artificial Intelligence Techniques"			
Artificial Intelligence Techniques	**Kolmogorov-Smirnov Test**		
	Statistics	**Degrees of Freedom**	**Significance**
	.063	179	.079

Figure (1) Histogram of the Data (Variable: Artificial Intelligence Techniques)

B. Data Distribution Test (Chameleon Leadership Variable)

When looking at the distribution of the variable "Chameleon Leadership", the Kolmogorov-Smirnov test was applied, and presented in table 2 and figure 2, the results show that the p-value of Chameleon Leadership variable is 0.059, which is larger than the conventional statistical significance level of 0.05, which leads to the conclusion that the test is not statistically significant. Coming from this, we can say that the "Chameleon Leadership" variable does follow a normal distribution and can be analyzed with parametric statistics.

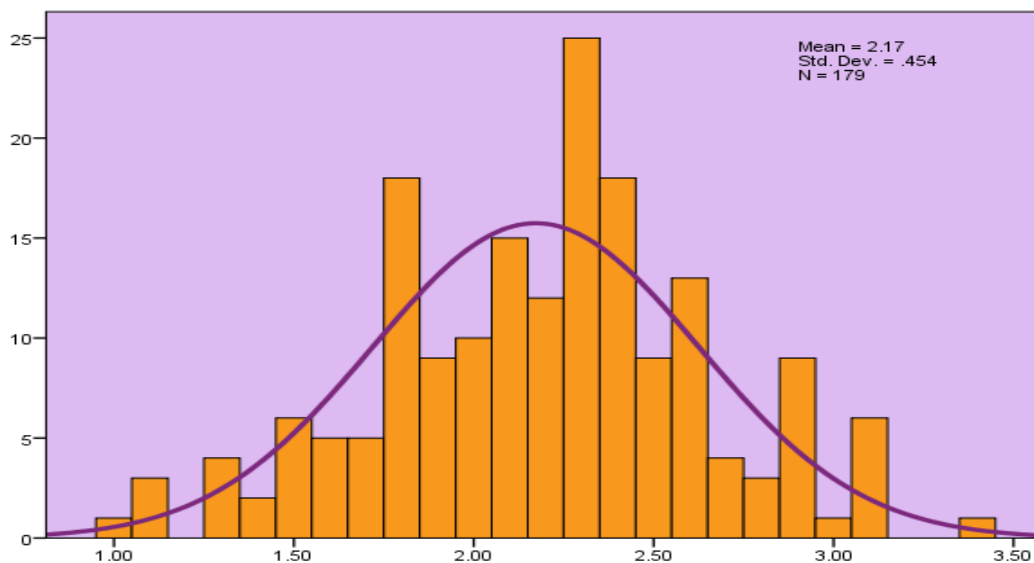| Table (2) Data Test for the Variable "Chameleon Leadership"			
Chameleon Leadership	**Kolmogorov-Smirnov Test**		
	Statistics	**Degrees of Freedom**	**Significance**
	.065	179	.059

Figure (2) Histogram of the Data (Variable: Chameleon Leadership)

2- Construct Validity for Measurement Tool Reliability

In order to evaluate the construct validity for the research dimensions and the variables involved, it will also be required to employ a series of statistical techniques that will produce the result required. Probably the most recognizable of these is the Cronbach's Alpha coefficient that tries to assess the reliability and consistency of the instrument employed for measurement. For Cronbach's Alpha to be of any real benefit, the resultant values must be higher than 75%. Table (3) presents the Cronbach's Alpha coefficients for the study variables and dimensions.

Table (3) Cronbach's Alpha Coefficients for the Study Variables and Dimensions

Variable		Cronbach's Alpha for the Entire Variable	Dimension	Number of Items	Cronbach's Alpha for Each Dimension	Cronbach's Alpha for the Entire Study
Artificial Intelligence Techniques (AIT)		.980	Expert Systems	5	.987	.985
			Neural Networks	4	.984	
Chameleon Leadership (CL)		.982	External Control	5	.983	
			Relative Beliefs	5	.982	

It appears from Table (3) that the Cronbach's Alpha values ranged between (0.982–0.987), which is statistically acceptable in administrative and social research because the values are greater than (0.70). This indicates that the measurement tool demonstrates internal consistency and reliability.

3- Confirmatory Factor Analysis

The study used Confirmatory Factor Analysis to verify the quality of the research measurement. Accordingly, the study included two main variables, and the indicators shown in Table (4) were used to demonstrate the goodness-of-fit indicators for the variables under investigation.

Table (4) shows the goodness-of-fit indicators for the study variables.	
Indicator	**General Rule**
Goodness-of-Fit Indicators	
1. X^2 (Chi-Square)	-
2. Degrees of Freedom (DF)	-
3. Ratio of X^2 to DF (X^2/DF)	(X^2 / Degrees of Freedom) Less than 5
4. Goodness-of-Fit Index (GFI)	Greater than 0.90
5. Root Mean Square Error of Approximation (RMSEA)	Between 0.05 – 0.08
6. Comparative Fit Index (CFI)	Greater than 0.90
7. Tucker-Lewis Index (TLI)	Greater than 0.90
2- Standardized Regression Weights (Standardized Loadings)	**Acceptable Loadings ≥ 0.5**

Source: Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. (2010). "Multivariate Data Analysis" ,7th ed., Prentice Hall, Upper Saddle. , Chan, F., Lee, G., Lee, E., Kubota, C., & Allen, Ch., (2007), "Structural Equation Modeling in Rehabilitation Counseling Research", Rehabilitation Counseling Bulletin, 51:1, 53-66.

The comparison was conducted using the goodness-of-fit criteria for the variables and their items, and all of them met the conditions. **Hair et al. (2010)** recommended using the indicators for the three categories (incremental fit indices, absolute fit indices, and adjustment-for-deficiency indices), and the model is considered acceptable through them. All conditions in the research model are consistent, as shown in **Table (5):**

Table (5) Goodness-of-Fit Results for Confirmatory Factor Analysis				
Fit Category	**Indicator**	**Condition**	**Artificial Intelligence Techniques**	**Chameleon Leadership**

Absolute Fit Indices	Chi-Square to Degrees of Freedom Ratio	CMIN/DF<5	3.255	4.416
Adjustment-for-Deficiency Index	Root Mean Square Error of Approximation (RMSEA)	RMSEA< 0.08	0.079	0.075
	Significance Level (p-value)	P ≤ 0.05	0.000	0.000
Incremental Fit Indices	Comparative Fit Index (CFI)	CFI > 0.90	0.913	0.921
	Tucker-Lewis Index (TLI)	TLI > 0.90	0.910	0.919
	Incremental Fit Index (IFI)	IFI > 0.90	0.904	0.907

Table (5) illustrates the confirmatory factor analysis for the **Artificial Intelligence Techniques** variable according to the **Modification Indices**, which includes two main dimensions consisting of (9) items. It is evident from Table (5) that all items of the Artificial Intelligence Techniques variable have values greater than (0.50), which indicates good **Goodness of Fit** quality. This provides a strong indication for conducting all statistical analyses. Moreover, Table (5), which presents the goodness-of-fit indicators for the model relationships between the dimensions, shows that all indicators were good, and that all model estimates were statistically significant at the level of (0.05). It is also clear that all standardized regression weights for the dimensions of Artificial Intelligence Techniques are equal to or greater than (0.50), which is a good indicator.

Similarly, Table (5) shows the confirmatory factor analysis for the **Chameleon Leadership** variable according to the **Modification Indices**, which consists of two main dimensions including (10) items. It is evident from Table (5) that all items of the Chameleon Leadership variable are greater than (0.50), indicating a good **Goodness of Fit** quality. This also provides a solid indicator for conducting all statistical analyses. Furthermore, Table (5), which represents the goodness-of-fit indicators for the model relationships between the dimensions, shows that all indicators were good and that all model estimates were statistically significant at the (0.05) level. It is also observed that all standardized regression weights for the dimensions of Chameleon Leadership are equal to or greater than (0.50), which is a good indicator.

Second: Descriptive Statistics of the Research Data

1- Artificial Intelligence Techniques (AIT)

The results in **Table (6)** indicate that the mean value of the **Artificial Intelligence Techniques (AIT)** variable reached **(3.66)** with a standard deviation of **(0.75)** and a coefficient of variation of **(20.5%)**, showing a tendency toward agreement and a **high response level**, with a **relative importance of (74%)**. This means that the study sample indicates a **high level of Artificial Intelligence Techniques practices** in the companies under study. Furthermore, the results in **Table (6)** show that the **Expert Systems (AITES)** dimension of Artificial Intelligence Techniques ranked **first**, with a mean of **(3.79)**, a standard deviation of **(0.704)**, and a coefficient of variation of **(20%)**, representing a **relative importance of (76%)**.

When considering the dimensions of the AI, the **Neural Networks (AITNN)** ranked **second**, coming in with a mean score of **(3.53)**, a standard deviation of **(0.79)**, a coefficient of variation of **(21%)** and accounting for **(71%)** of the total **relative importance.**

This indicates that the companies in the study sample possess a **high level of neural network practices** within Artificial Intelligence Techniques.

Table (6) Descriptive Statistical Analysis of the Items and Dimensions of Open Innovation (OPNV)

Item Code	Mean	Standard Deviation	Coefficient of Variation (%)	Relative Importance (%)	Importance Rank
AITES1	4.24	0.449	11%	85%	1
AITES2	4.09	0.527	13%	82%	2
AITES3	3.89	0.678	17%	78%	3
AITES4	3.09	1.192	39%	62%	5
AITES5	3.66	0.676	18%	73%	4
AITES	**3.79**	**0.704**	**20%**	**76%**	**First**
AITNN1	2.35	0.904	39%	47%	4
AITNN2	3.52	0.696	20%	70%	3
AITNN3	4.27	0.658	15%	85%	1
AITNN4	3.98	0.906	23%	80%	2
AITNN	**3.53**	**0.79**	**21%**	**71%**	**Second**

AIT	3.66	0.75	%20.5	%74	***

2- Descriptive Analysis of the Chameleon Leadership Variable (CL)

The results in Table (7) show that the overall mean of the Chameleon Leadership variable reached (4.03) with a standard deviation of (0.528), a high level of agreement, a coefficient of variation of (13%), and a relative importance of (81%).

Furthermore, the table indicates that the dimension of Relative Beliefs (CLRB) ranked first, with a mean of (4.12), a standard deviation of (0.557), a high level of agreement, a coefficient of variation of (14%), and a relative importance of (82%). The second rank was occupied by the External Control dimension (CLEC), with a mean of (3.95), a standard deviation of (0.513), a coefficient of variation of (13%), a relative importance of (79%), and a high level of agreement.

Table (7) Descriptive Statistics Analysis for the Items and Dimensions of Chameleon Leadership (CL)

Item Code	Mean	Standard Deviation	Coefficient of Variation %	Relative Importance %	Importance Ranking	Item Code	Mean	Standard Deviation	Coefficient of Variation %	Relative Importance %	Importance Ranking
CLEC1	3.92	0.6	15%	78%	3	CLRB1	4.06	0.539	13%	81%	3
CLEC2	3.81	0.544	14%	76%	4	CLRB2	3.96	0.573	14%	79%	5
CLEC3	4.2	0.503	12%	84%	1	CLRB3	4.17	0.667	16%	83%	2
CLEC4	3.78	0.729	19%	76%	5	CLRB4	4.02	0.802	20%	80%	4
CLEC5	4.03	0.508	13%	81%	2	CLRB5	4.38	0.506	12%	88%	1
CLEC	3.95	0.513	13%	79%	Second	CLRB	4.12	0.557	14%	82%	First
						CL	4.03	0.528	13%	81%	****

Third: Testing the Research Hypotheses

In this section, the main research hypothesis related to correlation and impact relationships is tested, in addition to the sub-hypotheses derived from it. The researcher uses statistical methods and tools to verify the research hypotheses and determine their validity. Simple correlation and simple linear regression for the study data are used as follows:

Correlation Hypotheses

Testing the First Main Hypothesis: "There is a statistically significant correlation between Artificial Intelligence Techniques and their dimensions and Chameleon Leadership."

It is clear from Table (8) that the Pearson correlation coefficient for the relationship between the variable **Artificial Intelligence Techniques** and the variable **Chameleon Leadership** is (0.929) at a significance level of (0.000), which is less than the significance level (0.05). This indicates that the test is statistically significant, demonstrating a strong positive correlation between **Artificial Intelligence Techniques** and **Chameleon Leadership**. In other words, an increase in **Artificial Intelligence Techniques** corresponds to an increase in the same direction in **Chameleon Leadership**. Based on these results, the first main hypothesis is accepted.

Table (8) Pearson Correlation Coefficient between Artificial Intelligence Techniques and Chameleon Leadership

Variable	Indicator	Chameleon Leadership
Artificial Intelligence Techniques	Correlation Coefficient	0.929**
	Significance Level	.000
	Sample Size	179

1- First Sub-Hypothesis: There is a statistically significant correlation between the Expert Systems dimension and Chameleon Leadership.

The statistics revealed in Table (9) are clear evidence that the Pearson correlation coefficient between the Expert Systems factor and Chameleon Leadership is (0.956) and that the level of its significance is (0.000), which lies below the preset level of significance of (0.05). This indicates that the results are proven to be statistically significant and are a clear evidence of a strong positive relationship between the Expert Systems factor and the variable of Chameleon Leadership. In other words, the increase in the Expert Systems factor corresponds to the increase in the variable of Chameleon Leadership. Thus, these results indicate the acceptance of the first sub-hypothesis.

Table (9) Pearson Correlation between the Expert Systems Dimension and Chameleon Leadership

Variable	Indicator	Chameleon Leadership
Expert Systems	Correlation Coefficient	0.956**
	Significance Level	.0000
	Sample Size	179

2- Second Sub-Hypothesis: There is a statistically significant correlation between the Neural Networks dimension and Chameleon Leadership.

The statistics provided in Table (10) are clear evidence that the Pearson correlation coefficient for the relationship between the Neural Networks dimension and the Chameleon Leadership is (0.938) at a level of (0.000) that is lower than the pre-set level of significance of (0.05). This evidence indicates that the result is statistically significant and that a strong positive relationship between the Neural Networks dimension and the Chameleon Leadership is revealed. In other words, a growth in the Neural Networks dimension is accompanied by a corresponding increase in the variable of the Chameleon Leadership. Based on that, the conclusion favoring the acceptance of the second sub-hypothesis is provided.

Table (10) Pearson Correlation Coefficient between Neural Networks Dimension and Chameleon Leadership		
Variable	**IndicatorIndicator**	**Chameleon Leadership**
Neural Networks	**Correlation Coefficient**	0.938**
	Significance Level	.0000
	Sample Size	179

Effect Hypotheses

Testing the Second Main Hypothesis: There is a statistically significant effect of Artificial Intelligence Techniques on Chameleon Leadership.

Table (11): Shows the Regression Analysis Test for the Main Hypothesis

Model Summary			ANOVA (Analysis of Variance)			Regression Coefficients				
Independent Variable	**Correlation Coefficient (R)**	**Coefficient of Determination (R²)**	**Calculated F-value**	**Significance level (Sig. F)**	**Degrees of freedom (Df)**	**|Dependent variable**	**β value**	**|Standard Error**	**Calculated t-value**	**Significance level (Sig. T)**
Artificial Intelligence Techniques (AIT)	0.731	0.627	98.10	0.000	179	**Chameleon Leadership**	0.551	0.021	24.31	0.000

From the previous table, we can conclude the following:

● Artificial Intelligence techniques' impact on Chameleon Leadership stands at 0.731, meaning that AI techniques have a very high positive impact on such leadership.

● The coefficient of determination (R²) equals (0.627), indicating that 62.7% of the changes in AI techniques are explained by changes in Chameleon Leadership.

● The computed F-value equals (98.10) at a significance level below (0.05), indicating a statistically significant positive effect of AI techniques on Chameleon Leadership.

● The regression coefficient equals (0.551), indicating that a one-unit change in AI techniques leads to a 55.1% change in Chameleon Leadership.

● The computed t-value equals (24.31) at a significance level below (0.05), indicating a statistically significant effect of AI techniques on Chameleon Leadership.

Based on the above, the first main hypothesis is accepted, which states: there is a statistically significant effect of Artificial Intelligence Techniques on Chameleon Leadership.

First Sub-Hypothesis:

"There is a statistically significant effect of Expert Systems on Chameleon Leadership."

Table (12): Shows the regression analysis test for the first sub-hypothesis

Model Summary			ANOVA (Analysis of Variance)			Regression Coefficients				
Independent Variable – First Dimension	**Correlation Coefficient (R)**	**Coefficient of Determination (R²)**	**Calculated F-value**	**Significance level (Sig. F)**	**Degrees of freedom (Df)**	**Dependent variable**	**β value**	**|Standard Error**	**Calculated t-value**	**Significance level (Sig. T)**

| Expert Systems | 0.745 | 0.631 | 93.31 | 0.000 | 179 | Chameleon Leadership | 0.521 | 0.071 | 25.74 | 0.000 |

From the previous table, we can conclude the following:

● The Impact of Expert System on Chameleon Leadership is estimated to be (0.745), representing a very strong positive impact.

● Coefficient of Determination (R²) is (0.631), hence 63.1% variation in Expert Systems is explained by variation in Chameleon Leadership.

● The calculated F-value is (93.31) with a threshold for significance that is lower than (0.05), implying a statistically significant positive contribution of Expert Systems towards Chameleon Leadership.

● Regression coefficient (β) is (0.521), meaning that a unit change in Expert Systems will produce a 52.1% change in Chameleon Leadership.

● The t-value estimated is (25.74) with a p-value below (0.05), hence confirming a statistical contribution of Expert Systems towards Chameleon Leadership.

● Based on the above, the first main hypothesis is accepted, which states: there is a statistically significant effect of Artificial Intelligence.

 The second sub-hypothesis:
"There is a statistically significant effect of Neural Networks on Chameleon Leadership."
Table (13): Shows the regression analysis test for the second sub-hypothesis.

Model Summary			ANOVA (Analysis of Variance)			Regression Coefficients				
Independent Variable: Second Dimension	Correlation Coefficient (R)	Coefficient of Determination (R²)	Calculated F-value	Significance level (Sig. F)	Degrees of freedom (Df)	Dependent variable	β value	Standard Error	Calculated t-value	Significance level (Sig. T)
Neural Networks	0.779	0.607	91.17	0.000	179	Chameleon Leadership	0.602	0.091	30.11	0.000

From the previous table, we can conclude the following:

● There is an effect of Neural Networks on chameleon leadership, with a value of (0.779), indicating a strong positive effect of Neural Networks on chameleon leadership.

● The coefficient of determination (R²) equals (0.607), indicating that 60.7% of the changes in Neural Networks are explained by changes in chameleon leadership.

● The calculated F-value equals (91.17) at a significance level below 0.05, indicating a statistically significant positive effect of Neural Networks on chameleon leadership.

● The regression coefficient (β) is quantified at 0.602, suggesting that a one-unit variation in Neural Networks results in a corresponding 60.2% alteration in chameleon leadership.

● The t-value calculated is (30.11) whose level of significance is less than 0.05 meaning that the influence of Neural Networks on the leadership of a chameleon is statistically significant.

Based on the above, the second sub-hypothesis is accepted, which states that there is a statistically significant effect of Neural Networks on Chameleon Leadership.

Conclusions and Recommendations
First: Conclusions

1. The efficiency of artificial intelligence or AI is hard to ignore, when banks look for ways to streamline their processes. Coming hotfooting from the world of tech, AI has the capacity to free up employees from tedious tasks and blast through the processing of banking transactions, and in the process, AI can shake up the way we work, and even help us create the perfect, well-organised workplace.

2. The adoption of AI technologies by banks contributes to fostering a positive atmosphere within the organization, creating ideal working conditions and friendly relationships among employees and between employees and the institution, leading to a cooperative environment.

3. Having "Chameleon Leadership" in banks aids the shaping of staff behavior that has a positive influence on administrative development and performance. This is done by steering staff towards embracing the building of habits

that create, apply, and spread ideas that drive the success of the organization, influencing them to employ mechanisms that innovate, apply, and spread ideas that drive the success of the institution.

Second: Recommendations

1. Lectures, training sessions, and workshops need to be continued by the banks to train senior management leaders that have the potential to lead the institution in reaching the objectives using the AI technologies. Seminars and training sessions also need to be continued for the awareness of the staff and their encouragement to utilize the AI technologies in all the functional areas.

2. Building the capabilities and culture of the employees in using the AI technologies is important for improved workplace communication and efficient employer-employee interaction. The more informed and awareness-conscious the employees are about AI, the greater their capabilities to accomplish a wide array of tasks without complaining or providing a negative track.

3. It is the duty of banks to make great efforts to assess the impact that the philosophies of Chameleon Leadership have on the work of the staff, their attitude, values, and behavior. It is required that organizations become more familiar with these behavioral aspects that generate fresh and diverse inventions.

References

Abbas, Ahmed Mohamed Gharib, (2024), *The Effect of Chameleon Leadership on Marketing Skillfulness among Fast-Food Employees: The Mediating Role of Job Maturity*, published research in *Journal of the Union of Arab Universities for Tourism and Hospitality*, Volume 28, Issue 1, Ismailia, Egypt.

Abdul Hussein, Ali; Mahmoud, Naji, (2022), *The Role of Chameleon Leadership Behaviors in Enhancing Organizational Effectiveness: An Exploratory Study of Opinions from Academic Leaders at Tikrit University*, *Tikrit Journal of Administrative and Economic Sciences*, College of Administration and Economics, Tikrit University, Iraq.

Fayyad, Saleem Rasheed Abboud, (2022), *The Role of Chameleon Leadership in Commercial Banks to Enhance Employee Engagement: An Analytical Study of Opinions from Employees in Iraqi Commercial Banks*, published research in *Warith Scientific Journal*, Volume 4, Issue 10, Karbala, Iraq. ISSN: 2618-0278

Abd Alhosine, A. B., & Mahmood, N. A. (2022). The role of chameleon leadership behaviors in enhancing organizational effectiveness an exploratory study of the opinions of a sample of academic leaders at Tikrit University. Tikrit Journal of Administrative and Economic Sciences, 18(58, 2), 272-291

Agung, A. D., Mohyi, A., & Nurhasanah, S. (2021). The Effect of Leadership Style and Employee Satisfaction on Employee Commitment of UMM Hospital Malang. Jurnal Manajemen Bisnis dan Kewirausahaan, 1(01), 64-69.

Alabadi, H. (2018). Adopting chameleon leadership behaviors based on strategic uncertainty – applied study in the Department of State Real Estate Najaf Branch. University of Kufa / Faculty of Management and Economics. Iraq.

Alabadi, H., & Al-Khakani, D. (2021). The role of strategic uncertainty in the adoption of behavior chameleon leadership - an applied study in the department of real estate state Najaf branch. IUG Journal of Economics and Business, 28(1), 96–113.

Alshadoodee, H. A. A., Mansoor, M. S. G., Kuba, H. K., & Gheni, H. M. (2022). The role of artificial intelligence in enhancing administrative decision support systems by depend on knowledge management. Bulletin of Electrical Engineering and Informatics, 11(6), 3577-3589.

Botega, L. F. D. C., & da Silva, J. C. (2020). An artificial intelligence approach to support knowledge management on the selection of creativity and innovation techniques. Journal of Knowledge Management, 24(5), 1107– 1130. https://doi.org/10.1108/JKM-10-2019-0559

Collins, C., Dennehy, D., Conboy, K., & Mikalef, P. (2021). Artificial intelligence in information systems research: A systematic literature review and research agenda. International Journal of Information Management, 60, 102383.

Durrah,Omar & Kahwaji, Ahmad,(2023), Chameleon Leadership and Innovative Behavior in the Health Sector: The Mediation Role of Job Security, Employee Responsibilities and Rights Journal (2023) 35:247–265 https://doi.org/10.1007/s10672-022-09414-5

Fawzi, H. (2018). Adopting chameleon leadership behaviors based on strategic uncertainty - applied study in the Department of State Real Estate Najaf Branch. University of Kufa / Faculty of Management and Economics. Iraq.

Federico ,Feldstein,(2019), Chameleon Leadership: Key Takeaways from the Popular Debate, https://www.linkedin.com/pulse/chameleon-leadership-keytakeaways-from-popular-feldstein-jd.

Guzman, A.L. and Lewis, S.C. (2020), "Artificial intelligence and communication: a human – machine communication research agenda", New Media and Society, Vol. 22 No. 1, doi: 10.1177/ 1461444819858691

Hamdoon, S. N. (2021). The role of the chameleon leadership in achieving marketing superiority in light of the environmental disruption an applied study in the Mosul dairy plant in Nineveh Governorate. Tikrit Journal of Administration and Economics Sciences, 17(53 part 1).

Harris, R., & Simons, M. (2020). Chameleon leaders? The influence of context on leadership in Australian private providers. In 21st National Vocational Education and Training Research Conference 'No Frills': refereed papers (p. 58)

Hmoud, B. and Laszlo, V. (2019), "Will artificial intelligence take over human resources recruitment and selection?", Network Intelligence Studies, Vol. 7 No. 13

Ionescu, L., (2019), Big data, blockchain, and artificial intelligence in cloud-based accounting information systems, Analysis and Metaphysics, No. 18,pp 44-49. https://doi.org/10.22381/AM1820196

Khaleel ,M., Abulifa ,S. A., & Abulifa ,A. A.,(2023), "Artificial intelligent techniques for identifying the cause of disturbances in the power grid," Brilliance, vol. 3, no. 1, pp. 19–31,.

Khaleel ,M., Yaghoubi ,E., Yaghoubi ,E., & Jahromi M. Z.,(2023), "The role of mechanical energy storage systems based on artificial intelligence techniques in future sustainable energy systems," Int. J. Electr. Eng. and Sustain., pp. 01–31.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and disadvantages of artificial intelligence and machine learning: A literature review. International Journal of Library & Information Science (IJLIS), 9(1), 3

Kumar , P. Durga Sai& Raj, P. Sunand(2023) Role of Artificial Intelligence in employee Training and Development ,International Journal of Humanities Social Science and Management (IJHSSM) Volume 3, Issue 4, Jul.-Aug., 2023, pp: 228-233 www.ijhssm.org

Lei, L., Wang, C., & Pinto, J. (2023). Do chameleons lead better? A meta-analysis of the self-monitoring and leadership relationship. Personality and Social Psychology Bulletin, 01461672231210778.

Massoudi, A. (2022). Reviving performance by adopting chameleon style of leadership. Journal of Management and Business Education, 5(1), 1–19.

Nyholm ,S.,(2024), "Artificial intelligence and human enhancement: Can AI technologies make us more (artificially) intelligent?," Camb. Q. Healthc. Ethics, vol. 33, no. 1, pp. 76–88.

Obaid ,Aseel Hameed & Khalaf ,Naima Zaidan,(2023), Constructing a scale for managing high-performance sports organizations using artificial intelligence techniques, University of Baghdad. Modern Sport, Vol.22, No.2 , 0001. DOI:https://doi.org/10.54702/ms.v22i2.1114

Paschen, U., Pitt, C. & Kietzmann, J. (2020), "Artificial intelligence: building blocks and an innovation typology", Business Horizons, Vol. 63 No. 2, pp. 147-155, doi: 10.1016/j.bushor.2019.10.004

Pisani, A. (2019). Culture Chameleon: Scholars examine the impact of new leadership on an organization. Pepperdine Magazine. https://www.pepperdine.edu/magazine/2019/04/culture-chameleon/

Pothen, A. S. (2022). Artificial intelligence and its increasing importance. "Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do"., 74.

Rospigliosi ,Pericles 'asher' (2023) Artificial intelligence in teaching and learning: what questions should we ask of ChatGPT?, Interactive Learning Environments, 31:1, 1-3, DOI: 10.1080/10494820.2023.2180191

Rospigliosi, P. A. (2022). Adopting the metaverse for learning environments means more use of deep learning artificial intelligence: this presents challenges and problems. Interactive Learning Environments, 30(9), 1573–1576. doi:10. 1080/10494820.2022.2132034

Shuford ,J. & Islam ,M. M.,(2024), "Exploring the latest trends in artificial intelligence technology: A comprehensive review," Journal of Artificial Intelligence General science (JAIGS), vol. 2, no. 1.

Sujata ,J., Aniket, D., & Mahasingh ,M.,(2019), "Arti0cial intelligence tools for enhancing customer experience," International , Journal of Recent Technology and Engineering, vol. 2, pp. 700–706.

Sultan ,Yousef A. H. & alhadraWi ,B. kh. ,(2015), The Chameleon Organization assumptions and Futures digital age Organization, International Journal & magazine of Engineering and Technology Management and Research,V.2,No.1 ,pp.190-199

Valavanidis, A,(2023). Artificial Intelligence (AI) Applications. Department of Chemistry, National and Kapodistrian University of Athens, University Campus Zografou, 15784 Athens, Greece .

Zhang, Y., Xiong, F., Xie, Y., Fan, X., & Gu, H., (2020), The impact of artificial intelligence and blockchain on the accounting profession, Ieee Access, No. 8, 110461-110477.