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IMPROVING SUSTAINABLE OPERATIONS PERFORMANCE THROUGH FOURTH INDUSTRIAL REVOLUTION TECHNOLOGIES: THE MEDIATING ROLE OF STRATEGIC INTELLIGENCE AND INTERACTION WITH STRATEGIC FLEXIBILITY-A CASE STUDY IN AL-NARJIS PIPE PRODUCTION COMPANY

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ABSTRACT

This study aims to investigate the impact of Fourth Industrial Revolution technologies on enhancing the performance of sustainable operations at Al-Narjis Company for Plastic Pipes Production, with a focus on the mediating role of strategic intelligence and the interactive role of strategic flexibility. The study sample consists of 100 employees from the company, with data collected using specially designed questionnaires. The Fourth Industrial Revolution technologies covered in this study include the Internet of Things (IoT), Artificial Intelligence (AI), 3D printing, and Big Data analytics. These technologies aim to improve operational efficiency, reduce waste, and increase productivity in sustainable ways. The mediating role of strategic intelligence was examined by exploring how the company uses intelligent information in making strategic decisions that enhance sustainability. Strategic flexibility was studied as an interactive factor contributing to the company's ability to quickly adapt to environmental and technological changes. The results indicate that Fourth Industrial Revolution technologies play a crucial role in improving the performance of sustainable operations at Al-Narjis Company, with a strong positive impact from both strategic intelligence and strategic flexibility. The findings illustrate that using these technologies, in conjunction with strategic intelligence and flexibility, can enhance the company's ability to achieve sustainability goals and adapt to technological changes. The study recommends increasing investment in Fourth Industrial Revolution technologies and developing the strategic capabilities of employees to boost efficiency and effectiveness in sustainable operations. It also suggests enhancing the company's strategic flexibility to keep pace with rapid technological advancements and competitive environment changes.

Keywords: Sustainable operations, Fourth Industrial Revolution Technologies, Sustainability, Strategic Flexibility, Strategic Intelligence, advanced manufacturing techniques, product design.

Biographical notes

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INTRODUCTION

With increasing environmental and economic challenges, sustainability in industrial processes has become a major strategic goal for companies around the world. In this context, Fourth Industrial Revolution technologies are emerging as key enablers that can radically transform how companies manage their operations and achieve their sustainable goals. These advanced technologies include the Internet of Things (IoT), artificial intelligence (AI), 3D printing, and Big Data analytics. These technological innovations are not only tools for improving efficiency and productivity, but also represent effective methods for achieving optimal use of resources and reducing environmental waste.

However, to realize the full benefits of these technologies, companies must be able to effectively integrate them into their operational strategies. Here the vital role of both strategic intelligence and strategic flexibility is highlighted. Strategic intelligence allows companies to make decisions based on accurate data and analyses, enabling them to quickly adapt to changes and challenges. While strategic flexibility enables companies to adjust their operational paths quickly and effectively in response to changing circumstances.

In this context, this study seeks to explore how Fourth Industrial Revolution technologies can improve the performance of sustainable operations at Al Narges Company for the production of plastic pipes. We will examine the mediating role of strategic intelligence and the interactive role of strategic flexibility in achieving this goal. By studying a sample of 100 company employees, we aim to provide deep and comprehensive insights into how these technologies can be used to achieve sustainable and effective results. This study is of great importance to companies seeking to achieve excellence in a competitive and rapidly changing industrial environment.

1) Research methodology

First: the research problem

The current research problem requires an intellectual and practical diagnosis based on the conceptual perspectives of the research variables and the nature of the mutual relationships between them. It demonstrates the reality of intellectual diversity regarding its variables, whether individually or together, and the extent of their depth of field and realistic reflection in Al-Narjis Plastic Industries Company. Accordingly, this research is framed by four interconnected variables: (Technologies of the Fourth Industrial Revolution, Sustainable Operations Performance, Strategic Intelligence, and Strategic Flexibility), through which the general problem of the phenomenon under study is determined, which was diagnosed cognitively as a result of the apparent weakness in the studies that dealt with the technologies of the Fourth Industrial Revolution. And the sustainable performance of operations, whether at the level of the Arab environment in general or the Iraqi environment in particular. As for the field problem, it was diagnosed through researchers' visits to Al-Narjis Plastic Industries Company, a sample of the research, and meetings with employees and workers in the company to diagnose the extent of their understanding and perception of the research variables at the individual level, as he identified that There is a clear deficiency in this area, so the research problem can be looked at in two aspects:

The first aspect: represented by the intellectual problem that is determined by the scarcity of studies that dealt with research variables (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, strategic flexibility) at the level of the industrial sector, in addition to the diversity, conceptual differences, and different intellectual visions of writers and researchers regarding cognitive frameworks and theoretical content. Concerning variables, in addition to the scarcity of theoretical contributions in framing the cognitive interrelationship between those variables.

The second aspect: It is represented by the field problem, which is determined by the weak awareness of the management of Al-Narjis Plastic Industries Company, the research sample, of the actual conceptual content of the research variables. In addition to that, the challenges facing this management in applying the dimensions of the research variables, which are represented by (technologies of the Fourth Industrial Revolution, sustainable operations performance, Strategic intelligence, strategic flexibility), as well as the need for this administration to create some kind of compatibility between the research variables to ensure its survival and continuity and enhance the sustainable performance of operations.

In light of the above, the intellectual and field research problem can be diagnosed in a number of questions, as follows:

1. Intellectual questions for the research problem

Intellectual research questions can be determined depending on the efforts and results reached by the researchers regarding the research variables, which are as follows:

a. What are the philosophical and intellectual foundations of the research variables (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, strategic flexibility)?

B. What are the reasons for the different intellectual vision around the concepts of (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, strategic flexibility)?

C. What are the characteristics and components of (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, strategic flexibility)?

Dr . What are the foundations and nature of the logical relationship linking the above research variables?

e. What tests are used to measure and evaluate sustainable operations performance?

And the. What are the behavioral procedures and components that contribute to the success of sustainable operations performance?

2. Field questions for the research problem

Field research questions can be determined based on the realistic vision of the sample studied regarding the research variables, which are represented by the following:

a. Do the employees at Al Narges Plastic Industries Company have a clear understanding of the research variables (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, strategic flexibility)?

B. How important are the research variables (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, strategic flexibility) and their sub-dimensions on the nature of the Narjis Plastic Industries Company, the research sample?

C. What is the nature and level of the influential relationship between the technologies of the Fourth Industrial Revolution and sustainable operations performance in its dimensions at the level of the research sample company?

Dr.. Does the variable of strategic flexibility mediate the influential relationship between the technologies of the Fourth Industrial Revolution and sustainable operations performance at the level of the company in the research sample?

Second: The importance of research

The research gains its importance in light of the importance of its researched variables, and this can be determined through the following:

1. The current research dealt with four variables characterized by modernity: (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, and strategic flexibility). According to the researchers' knowledge, this is the first research that has linked these variables in one field of study, and thus it can constitute a comprehensive scientific addition to the library. Iraqi intellectual.
2. The research variables refer to two important fields in business administration (production and operations management, and organizational behavior), and this in turn deepens and contributes to creating intellectual interaction and serious contribution to establishing new conceptual foundations.
3. The importance of examining the latest findings of researchers and writers in the intellectual fields of research variables, with the researcher focusing on the sobriety and modernity of the sources.
4. Identifying the capabilities and capabilities of the research sample company in the field of (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, strategic flexibility) is of particular importance because if the nature of the relationships between these variables is adopted, it can lead to positive results that serve The industrial sector in general.
5. The importance of explaining the role of Fourth Industrial Revolution technologies and strategic flexibility as critical variables in building and enhancing the performance of sustainable operations, especially in the research sample company.
6. The benefit of this research lies in directing the management of the researched company to benefit from the Fourth Industrial Revolution technologies available to employees as the primary source that enhances the sustainable performance of its operations.
7. Examining and measuring the influence and correlation relationships between the main and subsidiary research variables is an important attempt in order to develop scientific plans and correct guiding paths that help the management of the research sample company in its future directions.

Third: Research Objectives

The current research seeks to establish the downward relationships between (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, and strategic flexibility), so the goals can be framed through the following:

1. Building a theoretical framework by following a series of specialized intellectual paths presented by researchers and theorists in order to reach precise concepts of the main and sub-

research variables and benefit from the knowledge they contain after analyzing their trends and interpreting their contents.

2. Presenting and describing the measurement models for the research variables (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, strategic flexibility) that researchers and theorists have arrived at and choosing the most appropriate models.

3. Research, investigate, and delve into the cognitive contributions of the main and subsidiary research variables in order to diagnose the logical relationship between those variables.

4. Identify the extent to which Al-Narjis Plastic Industries Company exploits the technologies of the Fourth Industrial Revolution and verify the extent to which this variable can improve the performance of sustainable operations.

5. Identify the level of influence between the technologies of the Fourth Industrial Revolution and sustainable operations performance, the research sample.

6. Identify the level of influence between the research variables (Fourth Industrial Revolution technologies, sustainable operations performance, strategic intelligence, strategic flexibility) in the research sample company.

7. Identifying the level of the mediating role of strategic flexibility in the relationship between the technologies of the Fourth Industrial Revolution and sustainable operations performance in the research sample company.

8. Identify the level of the interactive role of strategic intelligence in the relationship between the technologies of the Fourth Industrial Revolution and sustainable operations performance in the research sample company.

Fourth: Hypothetical research plan

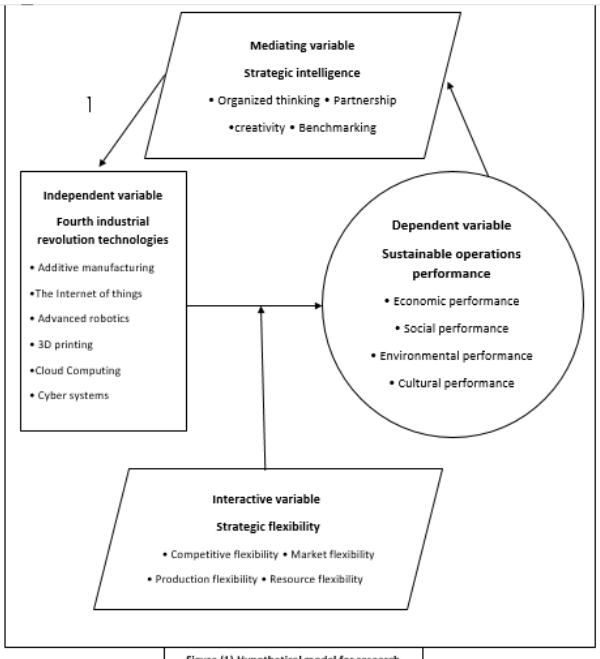

Figure (1) Hypothetical model for research
Source: Prepared by the researcher

Fifth: Research hypotheses

The first main hypothesis: There is a significant relationship of influence between the independent variable, Fourth Industrial Revolution technologies, and the dependent variable, sustainable operations performance.

The second main hypothesis: There is a significant influence relationship between the independent variable, Fourth Industrial Revolution technologies, and the mediating variable, strategic intelligence.

The third main hypothesis: There is a significant relationship of influence between the mediating variable, strategic intelligence, and the dependent variable, sustainable operations performance.

The fourth main hypothesis: There is a significant relationship of influence between the independent variable, fourth industrial revolution technologies, and the dependent variable, sustainable operations performance, mediated by strategic intelligence.

The fifth main hypothesis: There is a significant relationship of influence between the independent variable, technologies of the fourth industrial revolution, and the dependent variable, sustainable operations performance, through the interactive variable, strategic flexibility.

The sixth main hypothesis: There is a significant influence relationship between the independent variable, Fourth Industrial Revolution technologies, and the dependent variable, sustainable operations performance, through the interactive variable, strategic flexibility, and the mediating variable, strategic intelligence.

Sixthly : Research Methodology

The research methodology determines the procedural steps and methods that researchers take in order to achieve the desired goals in light of the characteristics of the sample studied and the nature of the relationships between the research variables. Accordingly, the research relied on (the descriptive analytical approach), which means studies that are concerned with collecting, summarizing, and classifying information and facts related to the behavior of a sample of individuals or the problems that researchers want to study for the purpose of analyzing, interpreting, and evaluating their nature to predict, control, or control them. Through this, it becomes clear to us that the descriptive analytical approach is not limited only to collecting information and data and classifying them, but rather goes to analyzing and interpreting them and clarifying the relationships between their variables.

Seventh: The research community and its sample

A . Research Community

Based on the primary goal of the research, which is to know the impact of the technologies of the Fourth Industrial Revolution on sustainable operations performance through strategic flexibility, the choice fell on Al-Narjis Plastic Industries Company in Basra Governorate to implement the practical aspect, and thus the research community consisted of Al-Narjis Plastic Industries Company, and the choice fell on Al-Narjis Plastic Industries Company's implementation of the field aspect is due to the great role that this company plays in developing and upgrading the industrial level, in addition to the multiple successes it has

achieved during recent years, whether at the level of services it provides or at the level of its social or investment activities, as well as for benefiting from the expertise Employees that can help researchers achieve results that serve the industrial sector.

B. Research sample

For the purpose of determining the sample size, the researcher relied on a statistical table to determine the appropriate sample size (Sekaran, 2003: 294), and since the size of the current research population is (100) employees at Al-Narjis Plastic Industries Company, the appropriate sample size is (100) employees, To ensure reaching this number, the researcher distributed (100) questionnaires within Al-Narjis Plastic Industries Company, from which (100) questionnaires were retrieved, and all of them were suitable for analysis, and thus the retrieval rate reached (100%).

2) The conceptual intellectual aspect of the research

First: Fourth industrial revolution technologies:

A) The cognitive foundations of the Fourth Industrial Revolution:

The invention of the Boeing 707 in 1958 led to an increase in the speed of aircraft, decreased transportation and communication costs, and the addition of the jet engine led to a significant decrease in the cost of air travel and shipping goods. Transportation and communication costs decreased significantly, and the amount of production increased as costs decreased. Applying advanced technologies and successful business practices in economic activities, as a result of which producers obtained higher incomes, and thus achieved significant economic growth worldwide [1]

3D printing or additive manufacturing has been defined as "the process of joining materials to make objects from 3D model data, usually layer upon layer, rather than subtractive manufacturing methodologies." The 3D printing production process is organized completely differently from the manufacturing process. (Charles Hull, IR2& IR1) The American inventor is credited with inventing the 3D printer via a lithography device (SLA) that was patented in 1984. It can print shoes, clothes, car parts, toys, guns, and industrial parts of the human body. I was able to make the modeling process Ten times faster and five times cheaper than regular research and development processes, all countries' producers can use 3D printers to create their prototypes within hours, instead of wasting months of time and perhaps millions of dollars in research and development [4]. They are used in a variety of industries, such as aeronautics, medicine, custom manufacturing, model building, art as well as education. Recently, 3D printers have become cheaper and all countries can use them for their necessary production. 3D printing uses the additive manufacturing process, that is, only the fixed amount of materials needed to produce a product, while subtractive manufacturing processes remove the materials needed to produce a product and generate waste that can be recycled into new inventory. [3]

B) The emergence of the fourth industrial revolution

We stand on the verge of a technological revolution that will fundamentally change the way we live, work, and relate to each other. In its scale, scope, and complexity, the transformation will be unlike any we have seen before. We do not yet know how it will unfold, but one thing

is clear: The response to it must be integrated and comprehensive, and include all stakeholders in the global political system, from the public and private sectors to academia and civil society. The first industrial revolution used water and steam energy to operate machines for production, the second industrial revolution used electrical power for production, and the third used electronics and information technology to automate Production. As for the Fourth Industrial Revolution, it works to employ the outputs of the Third Industrial Revolution, which can be described as the digital revolution. This fourth revolution is characterized by harmony, harmony, or integration of a group of technologies that transcend the boundaries separating the physical, digital, and biological domains. [2] There are three reasons why today's transformations represent the subtractive manufacturing revolution. It is a traditional manufacturing process that involves removing material from a workpiece to produce the final product. It is used in a wide range of industries, including aerospace, medicine, custom manufacturing, prototyping, art, and education.1 In this process, material is removed from the workpiece. Using tools such as cutters or abrasive tools1, subtractive manufacturing is used to produce custom parts individually or in small quantities. [1]

The Fourth Industrial Revolution does not represent merely an extension of the Third Industrial Revolution, but rather the arrival of a fourth revolution characterized by the speed of change, its scope, and its impact on the prevailing systems. The current speed of change has no historical precedent. Compared to previous industrial revolutions, the Fourth Revolution is developing at an exponential pace, not linear. In addition, It affects almost every industry in every country, and the breadth and depth of these changes herald the transformation of entire production, management, and governance systems [6].

C) The concept of the fourth industrial revolution

The term "Fourth Industrial Revolution" is comprehensive and is used to describe a group of connected contemporary technological technologies that provide a basis for further expansion in the digitization of the business environment. It is a revolution led by a number of main drivers and cannot be reduced to a single technology. This revolution is based on an integrated set of technologies completely or completely. In part to create an economic, social and political transformation, we note that the time distance between the dates of the occurrence of discoveries and inventions is shorter than it was yesterday. The transition from agriculture to industry required several centuries, but now we live in light of developments and inventions that are separated in time by only a few years [3]The Fourth Industrial Revolution is the current and evolving environment in which advanced technologies and technological trends exist such as the Internet of Things (IOT), virtual reality (VR) and artificial intelligence (AI) that will change the way modern people live and work. [7]Integrating these technologies into manufacturing practices is known as (Industry4.0) [9]It is important to realize that the Fourth Industrial Revolution involves systemic change in many sectors and aspects of human life. The comprehensive impacts of emerging technologies are more important than the exciting capabilities they represent. There has recently been an expansion The ability to dramatically liberate the basic building blocks of life through artificial intelligence is to increase processes and skills in every industry. Automation is disrupting transportation and manufacturing models that date back to the era before the Fourth Industrial Revolution. The

result of all of this is a societal transformation on a global scale, by influencing Incentives, rules and standards of economic life. [4]

Technology has become an integral part of daily life, and the technological platform has also become essential for contemporary manufacturing operations. Information technologies and digital transformation are among the main drivers of technological change and basic requirements for ensuring competitiveness at the level of individual institutions and at the level of international institutions as well. These engines facilitate the restructuring of economic operations. And productivity, as well as a radical increase in productivity, improving quality and reducing the cost of goods and services. New technologies carry out the process of collecting and compiling available information, processing, analyzing and sharing it. [1] This process differs fundamentally in the level of quality with the minimum role of human input and the use of traditional techniques in processing big data, as These technologies have become the engines of the Fourth Industrial Revolution. The main ideological hypothesis for studying the Fourth Industrial Revolution is that with each stage. [6]

Through the stages of technological development, the human race has constantly moved from one economic practice to another, newer and more efficient, from high-cost energy sources to low-cost energy sources, and from heavy-weight and fragile materials in terms of quality to lighter-weight, more flexible and resistant ones. In addition, people have always worked on Complexizing and increasing the efficiency of the means of production, expanding and developing their interfaces, all of this was accompanied by technological progress that was the engine of these changes and a tool for the development of the individual and all of humanity . [7] Employing the Fourth Industrial Revolution in various sectors can lead to improving productivity and quality. And cost, marketing, distribution and services, can also lead to improved management, planning, analysis, communication and learning, can lead to improved environment, health and safety. [8]

D) Foundations of the Fourth Industrial Revolution

The Fourth Industrial Revolution is characterized by the connection between the digital, biological and physical worlds and the growth of technology in areas such as artificial intelligence, cloud computing, robotics, 3D printing, the Internet of Things and advanced wireless technology. It is a movement towards data being a global currency. The consumer market is now more informed about purchasing decisions and can anticipate buying or More personalized browsing [1]

Today's combination of powerful machine learning algorithms, low-cost sensors, and advanced actuators allows technologies to be seamlessly integrated into our physical environment. Moreover, when combined with advanced imaging, signal processing, and gene editing methods, they have the potential to influence our cognitive-physiological state. Digital technologies are part of Because they give rise to a new layer of physical and biological technologies, it is important to consider the ways in which emerging contemporary technologies work and to expand capabilities beyond the current function of being able to transfer, store, and process large amounts of data. [10] This revolution in terms of the technologies that you see today is driving change and forming a fertile layer of innovation based on digital foundations. These technologies have become robotics, advanced materials,

genetic modifications, the Internet of Things, drones, neural technologies, self-driving vehicles, artificial intelligence, and vision. Mechanism, more integrated into our physical, social and political spaces, changing behaviors and relationships. [14] The results of research and development, continued marketing and adoption of emerging technologies are of far greater importance than the products that make our lives easier. [11]Reflecting a fundamental set of shifts in human identity and restructuring the ways in which we experience the world, it aims to (4IR) aims to help individuals and organizations understand the interaction between humans and technology. At a time when computing power, bio- and artificial technologies are advancing. Artificial intelligence, renewable energies, additive manufacturing, and many other emerging technologies threaten to overwhelm us with complexity. From autonomous vehicles to advanced robotics, the new era will bring challenges. Technical and ethical for different sectors . [12] Here, we must delve into the depths of the revolution's outcomes and its foundations, including the following:

The first pillar, artificial intelligence: Artificial intelligence appears today as one of the most important basic technologies for building the future, especially as it is considered one of the foundations of the Fourth Industrial Revolution, which is considered a major driver of economic growth and diversification in the twenty-first century. It is one of the branches of computer science, so it is known as the study and design of systems or... Devices that visualize the surrounding environment in order to behave in ways that mimic human actions. It is the science and engineering of making smart machines. Artificial intelligence is a science whose primary goal is to make computers and machines acquire the quality of intelligence and have the ability to do things that were limited to humans, such as thinking, learning, creativity, and communication [13]

The second pillar, robotics: Robots and artificial intelligence were designed to be intertwined by nature. The majority of previous generation robots were "pre-programmed" to produce a specific physical series of movements or functions for manufacturing or transportation. [15] This is still effective in some circumstances. Robots that take advantage of artificial intelligence can It can improve after the basic programming is developed to be able to continually increase efficiency. [19]For example, an "intelligent robot" that makes a batch of products from multiple inputs can, over time, develop and implement a production schedule that is many times more efficient than the original programming. [11] The development of robots in the fact that humans have economic, physical, mental and social needs side by side in addition to the legal conditions surrounding labor laws which leads to a kind of disability in efficiency. Robots do not have the same needs as humans and companies do not need to adhere to employment laws, which leads to the growth of Exponentially in efficiency and production, the development and implementation of robots will eliminate a large portion of the low-skilled manual jobs currently occupied by workers that do not add value to the work [21]. Industrial sector experts and leaders believe that the new technological solutions ushered in by the Fourth Industrial Revolution Such as advanced robotics, self-driving systems, and additive manufacturing will revolutionize traditional methods of value creation, as the costs of deploying advanced technology (advanced robotics) continue to decline. According to this equation, the location of production will no longer affect labor wages [16].

Second: Sustainable operations performance:

Sustainable operations performance is a fundamental concept in modern management that seeks to balance economic, social and environmental objectives. With increasing global attention to environmental issues and climate change, sustainability has become central to the business strategies of companies and industrial organizations. This study addresses the concept of sustainable operations performance, its importance, and practical applications in various industries, with a focus on how companies can achieve sustainable goals by improving their operational efficiency and reducing their environmental impact. [17]

1) The concept of sustainable operations performance

Sustainable operations performance refers to implementing operational activities and processes in a way that maintains a balance between achieving profitability, reducing environmental impact, and enhancing social responsibility. [12]This approach seeks to improve efficiency and effectiveness in operations while ensuring that resources are used in a rational and sustainable manner. This concept is based on clean and efficient production practices that reduce waste and harmful emissions, ensure the sustainability of natural resources, and enhance the health and safety of workers and surrounding communities. [11]

2) The importance of performing sustainable operations

The importance of sustainable operations performance is evident in several key aspects: [20]

- Preserving the environment: Sustainable operations contribute to reducing the environmental footprint of companies by reducing harmful emissions and waste, and preserving natural resources.
- Economic effectiveness: Sustainable operations contribute to improving operational efficiency and reducing costs through optimal use of resources and reducing waste, which leads to improved profitability.
- Social Responsibility: Sustainable operations enhance corporate social responsibility by providing a healthy and safe working environment for employees, and contributing to the development of surrounding communities.
- Competitive advantage: Sustainability can contribute to building a positive reputation for a company, enhancing its attractiveness to investors, customers and business partners, and supporting the achievement of a long-term competitive advantage.

3) Applications of sustainable process performance in industry

Sustainable process performance applications are numerous in various industrial sectors, and include: [21]

- Green Manufacturing: Green manufacturing refers to the use of production technologies and processes that contribute to reducing environmental impact. This includes improving energy efficiency, using renewable materials, and reducing waste and harmful emissions.
- Water resources management: These applications include improving water use efficiency in industrial processes, and reducing water pollution through wastewater treatment and reuse.
- Waste Management: Waste management applications include reducing waste, recycling, and using waste as inputs into other production processes. These practices contribute to reducing environmental costs and enhancing sustainability.

- Renewable energy: This includes the use of renewable energy sources such as solar energy, wind energy, and geothermal energy to operate industrial processes, which reduces dependence on fossil fuels and reduces carbon emissions.
- Sustainable product design: Sustainable design involves developing products that last longer, use sustainable materials, and are recyclable or biodegradable. This contributes to reducing the environmental impact of products throughout their life cycle.

4) Challenges of achieving sustainable operations performance

Despite the many benefits of performing sustainable operations, companies face several challenges in achieving this goal: [24]

- Cost: Transitions towards sustainable operations may require significant investments in technology and infrastructure, which can be challenging for SMEs.
- Complexity: Sustainable operations require complex coordination between different parts of the company and supply chains to ensure sustainable goals are achieved efficiently.
- Cultural change: Achieving sustainability requires a cultural change within the company, as awareness of the importance of sustainability must be enhanced among employees and motivated to adopt sustainable practices in their daily work.
- Regulation and legislation: Sustainability-related legislation and regulations may vary from country to country, adding an additional layer of complexity for companies operating in multiple markets.

5) Future strategies to enhance the performance of sustainable operations

To enhance the performance of sustainable operations in the future, companies can adopt several strategies: [22]

- Technological innovation: Investing in new technologies such as artificial intelligence, the Internet of Things, and big data analysis to improve the efficiency of operations and reduce environmental impact.
- Collaboration and Partnerships: Collaborate with suppliers, customers and NGOs to jointly develop sustainable solutions, and promote innovation in the supply chain.
- Education and training: Promoting awareness of the importance of sustainability and providing training programs for employees on sustainable practices and the best ways to implement them.
- Performance measurement and reporting: Develop systems to measure, evaluate and report sustainable performance transparently to enhance accountability and continuous improvement.

Third: Strategic flexibility

The business environment has become more complex due to changing customer needs and desires and intense competition, in addition to technological development and the occurrence of crises, which requires organizations to develop flexible strategies to confront such challenges, as it helps organizations adapt to changes, as it is an urgent necessity to maintain the vitality of organizations in the midst of a very complex environmental reality. [21]And the mystery.

1- The concept of flexibility:

The term "flexibility" is one of the terms commonly used in scientific literature. It was used in 1794 in the field of earth and planetary sciences, and was used for the first time in the field of management and accounting in 1957. Originally, the term flexibility refers to the existence of multiple options through which the organization can transform from One choice to another [22]. The increasing scientific research in the field of resilience is mainly due to the fact that the flexibility of organizations is essential to respond to changes and uncertainties in the business environment [23]. The ability to respond to changes in the needs of different customers quickly is among the standards [11]. It was able to exploit new opportunities as well as adapt to different requirements [21]. Flexibility is defined as the general concept of flexibility of resources and services in order to achieve market stability or improvement [23]. Flexibility is a measure of the organization's readiness to respond and adapt to changes in the environment, technology, and market, as customers' needs and preferences are constantly changing, which requires organizations to achieve good performance by improving their ability to respond to changes quickly [25]. Flexibility works to create diverse and new ideas that enable changing the course of planning in accordance with the changes that occur in the environment [23].

2- The development of the concept of strategic flexibility

Studies in the field of strategic flexibility began in three periods of time. They began in the 1970s by focusing on the fact that strategic flexibility is a response to environmental changes that make the organization less vulnerable to what accompanies rapid environmental changes [12]. Then, in the 1980s, the concept of strategic flexibility was linked to the organization's ability to Restructuring itself and its relationships with the external environment and adapting in order to confront competitors [24]. The third era, which extended from the 1990s until now, relied on information and the importance of obtaining it in order to analyze this information and know what is happening in the environment and adapt to it, so flexibility is considered Strategy is one of the most important tasks of managers in order to adapt to an environment of rapid change [11]

3- Definition of strategic flexibility

Uncertainty in economic and political trends, increasing global competition, technological development, and shifts in societal values and customer needs require organizations to provide innovative products and services to satisfy customers, as the ability to bring about change in products, services, and operations depends on the ability to quickly adapt to environmental changes, to ensure success in obtaining On sustainable competitive advantages, flexibility can be viewed as a characteristic of an organization that makes it less vulnerable to unexpected external changes or puts it in a better position to respond successfully to change. [3]

4-Types of strategic flexibility:

1- Flexibility of competition

Competitive flexibility represents the ability to respond to unique and changing customer needs, and adapt to environmental requirements, and enables organizations to compete in

local and global markets, which are highly competitive by diagnosing environmental changes, setting a competitive price, and reducing production costs [11]. Competitive flexibility is the ability of organizations to develop new products and services in a shorter period than competitors to obtain their market share [21]

Competitive flexibility lies in the organization's ability to compete in dynamic markets characterized by high competitive intensity, demand, or technological developments. Organizations may face many competitive pressures, such as developing new products that threaten their position in the market or the entry of new competitors. Therefore, highly agile organizations have the ability to scan the environment, evaluate markets and competitors, restructure and transform quickly before competitors [25].

2- Market flexibility

Market flexibility refers to the organization's ability to change its marketing efforts in a changing environment within a short period and the possibility of modifying products according to the needs and desires of customers in different markets [1]. It represents the ways in which the manufacturing system can adapt to the changing market environment. To enable the organization to respond to changes without affecting the work and to enable the organization to outperform its less flexible competitors in exploiting opportunities and the ability of the manufacturing system to respond to or influence market changes [11]. It may be represented by the organization's ability to re-evaluate its marketing efforts within a short period and adjust them quickly in a changing environment [1]. Marketing flexibility also emphasizes the organization's ability to modify products in target markets according to customer requirements within a short period [13].

3- Flexibility of coordination

Coordination flexibility is defined as the possibility of coordination between multiple functional departments, which allows integration, compatibility and harmony between different administrative levels to achieve common goals efficiently and effectively. Through the coordination mechanism in the organization and the exchange of different points of view and important information, they can exchange knowledge between different functional departments in the context of a dynamic and competitive environment. Flexibility in coordination emphasizes cooperation, harmony, and unifying efforts to reshape and distribute resources effectively among organizational departments to achieve common goals (2020:266, Alabbadi), it represents the organization's ability to form, identify and deploy resources and use a range of strategic options, in order to develop new products, expand and redistribute resources at low and short-term costs (Al-Khalifa, 2021:49). The organization's resources are collected and unified in various ways to form new groups of resources in response to environmental changes, and the flexibility of coordination increases as the costs, difficulties, and time required for these operations decrease. (Caroline, 2020: 57)

4- Resource flexibility

The organization can deal with its financial, human, knowledge, and skill resources, giving it the ability to activate its strategic options through different administrative systems, and the ability to transform flexible resources into multiple uses, that is, the flexibility to allocate

resources to multiple uses to produce and distribute products effectively. [1] Flexible resources can be used for alternative uses at low costs and with less time to switch between alternative uses, as the degree of resource flexibility can be increased by reducing the time required to switch to an alternative course of action. [21]

Flexible resources can be used for many uses, quickly and without additional cost, and can be measured through the alternative use of resources, the costs of moving from one resource to another, and the time of moving from one resource to another [10]

5- Production Flexibility

Production has a major role in directing the various activities of the organization in order to meet the needs of customers, so production flexibility is a measure of the organization's speed in transforming its operations from current products to producing new products in new technological paths, as well as rapid adaptation to changes in the circumstances facing the organization that require transformation. From one product to another or from one production level to another, and measuring flexibility according to the amount of time spent [1]. Al-Bayati pointed out that in order for production flexibility to be achieved, the organization must have the ability to diversify products and their functions. Through production flexibility, organizations can diversify and modify their products with greater efficiency, quality, and speed. It also gives the organization the ability to introduce new products in a short period of time [11]. That is, the ability of the manufacturing system to quickly introduce and manufacture new parts and products [9].

6 -Components of strategic flexibility

Organizations try to develop strategic flexibility in all areas of their operations, and in order for the organization to be strategically flexible on an ongoing basis, it should adopt a number of measures that help it navigate the new competitive landscape, which contribute directly or indirectly to achieving strategic flexibility and competitive advantage. . There are six basic components in order to achieve strategic flexibility [14]: -

1. Strategic Leadership: - Strategic leadership influences by including flexibility in vision, mission, and resource mobilization
2. Core capabilities: Organizations need to develop a unique set of resources to build a competitive advantage. These activities are linked to research and development, technological prowess, and exemplary customer service.
3. Human capital development: Human resources management can be outsourced and human resources training and development policies can be set.
4. Use of technology: Organizations should use a set of modern technologies.

Fourth: Strategic Intelligence:

One of the masterpieces of God (Almighty and Majestic) is that He created man and favored him over His creation and distinguished him from other creatures by the essence of reason, as mentioned in the Almighty's saying (And We have honored the children of Adam and carried them on land and sea and provided them with good things and favored them over many of those whom We created with a great preference. [1] The significance of preference here came in the blessing of reason and understanding for man, honoring him, and empowering him through thinking and insight, through which he can improve his affairs and ward off harm to

him with various types of sciences, concepts, and knowledge, including strategic intelligence, as it is a concept linked to mental perception and enables the individual to deal with situations and plan in advance for them, so embracing it before Help organizations discover opportunities and get rid of competitive pressures. On the basis of that, this study begins to include the following aspects: the emergence and development of strategic intelligence, its importance, goals, and dimensions of measuring it in organizations. [16]

1- The emergence and development of strategic intelligence:

Saturating the current situation with technology and smart tools has become one of the indispensable necessities in the business world, as organizations have begun to witness widespread development in the search for supporting concepts, especially in the field of strategic intelligence, which has become a source of revitalization for societies, countries, and their politicians, and their adherence to this perspective has made it a guide for formulating decisions and policy. On the internal and external levels of what intelligence achieves [16]

Strategic intelligence has returns that bring prosperity to countries and their societies [8]. Researchers have dealt with the term strategic intelligence in various fields, published many research and studies about it, and presented many theories to explain it [19]. The uses of strategic intelligence have been numerous, resulting in more than one concept, but it lacks accuracy despite the time period of its historical practice, as many standards for identifying this pattern appeared before international and regional organizations and private sectors. Indicators of its first appearance were in the military operations of the fourth century BC. He is considered one of the most prominent strategists. [1] The military who called for this concept in his book (The Art of War) and the Central Intelligence Agency (CIA) was the first to use this pattern in arms control agreements and its purpose was to achieve strategic goals (McDowl1, 2008:4). Strategic intelligence has also had its horizons expanded by international and local business organizations and commercial agencies, as these organizations began seeking to create what is called the (strategic intelligence community) because of the vitality of that role and what it produces. [20]

Of useful ideas (cultural, economic, political, technological and cognitive) that contribute to providing information

For decision makers and serves stakeholders [9]

2) The concept of strategic intelligence:

In the management and business literature, organizations began to engage in dialogue with themselves to divest themselves of traditional management, search for the keys to the secret of success in the business world, and access the system of strategic intelligence, which had an impact on many axes represented in a successive series, starting from the top of its pyramid, the senior management, the middle levels, and its working personnel, all the way to the activities related to performance. Its operations that it seeks [1]. It is possible to address the concept of strategic intelligence and explain what has been said about this term in order to document its importance and goals, reaching its dimensions selected in the current study. Intelligence alone has not had a complete picture for most researchers and writers. Some of them interpreted it as the individual's ability to think logically or as the ability to process symbols and reach explicit milestones. Some believe that intelligence is concerned with acumen and cleverness [1]. Interest in intelligence was evident ages ago, and in the wake of

that, ancient philosophers, including Aristotle, went on to say that the characteristics of individuals vary according to their environment, including intelligence, while Plato believes that intelligence is an innate ability that is refined and grows through learning and acquisition.

And adapting to different circumstances [17] While some have pointed out that intelligence is the ability generated from mental adaptation to deal with a specific situation, and that the multiple reasons for disagreement about knowing the nature of intelligence require the formulation of many standards, so scientists have sought to find standards that distinguish between intelligent people from others in various ways.

Fields [3]Starting from the first stage of standards, the two worlds were

They were the first to design a scale to distinguish weak-minded children from French schools, and modifications were made to that scale over varying periods of time to conclude that intelligence is a cumulative product that matures with the advancing age of the individual, while the "Express" scale of intelligence came to measure the organization's ability to use intelligence as a means of obtaining Information to help managers and expand their awareness in setting strategic goals [13].As for the term strategic intelligence taken together, it was prepared to provide knowledge for leaders of organizations and help them grow

Better performance as a means of broad understanding of the current highly competitive environment based on new knowledge, methods and innovations due to their increasing weight and enormous weight in the success of organizations, and the result of these transformations will lead to a shift in power towards working individuals and competencies become of strategic importance and that

What leaders need in the global and knowledge era, in which they face rapid changes, is to find new types of strategic intelligence that stem from the ability to extract skills and knowledge from different. [12]

Organizational, technical, and human resources fields and coordinating them with comprehensive goals, including (business intelligence, competitive intelligence, knowledge intelligence) [10]. Strategic intelligence also contributed significantly to its support for senior leadership in contemporary organizations, as it provides them with future visions and creative capabilities, as well as providing basic information about the organization's business environment, as well as processing and analyzing it to formulate plans and policies in an ideal manner.

3) The importance of strategic intelligence:

Strategic intelligence is the main axis in developing and formulating future plans for the organization, and its importance has increased in all areas of strategic management as a result of the many challenges presented by the external environment of organizations [18]. Its importance also stems from the fact that it is part of the organization's culture, enhances teamwork, helps determine the jobs and responsibilities of subordinates, controls their behavior and performance, and achieves their aspirations that are compatible with the organization's goals and directions. Organizations seek to determine their vision and strategic direction to know the context in which they will work, focus on competitors' trends, and learn

about their policies. And their competitive strategies (such as cost differentiation, differentiation, and focus). [1]

Strategic intelligence provides leaders with correct and meaningful information that is appropriate for their approach to overcoming the crises facing organizations .The importance of strategic intelligence can be highlighted through the following: [11]

1- Empowerment through analysing the organization's comprehensive goals to ensure strategic success (strategic quality and strategic differentiation).

2- Strategic intelligence is an activity that provides the organization with the information it needs to learn about its business environment in order to develop appropriate strategies and plans that will create value for customers and growth and profits for it in the future.

3- Strategic intelligence provides real advantages to leaders and consolidates their basic characteristics and has become an indispensable necessity in organizations. Its importance is highlighted in formulating and defining high-quality, relevant and timely strategies, as well as in refining and monitoring internal performance and as an approach to enhancing the ability to confront competitors.

4- The need to integrate and coordinate efforts for (business intelligence, competitive intelligence, and knowledge management) to support decision makers in information about the business and the organization's environment related to (markets, customers, and competitors), and to analyse and compile it in one process for ease of control according to a system that meets the organization's strategic planning and decision-making. (

4) Objectives of strategic intelligence:

It can be said that strategic intelligence is an important and effective strategic tool through which the organization seeks to achieve a number of functions and goals. It has been defined by [11] as follows:

1. Providing early predictions and real-time warnings of the threats surrounding the organization and working to take appropriate preventive measures against them.
2. Enabling the organization to understand and respond to current and future environmental changes and plan results that will enhance its reputation and position among competitors.
3. Forming the convictions of decision-making leaders who are responsible for formulating policies and strategies and reaching decisions in a creative way to maximize the organization's success.
4. Carrying out the task of collecting, analyzing and evaluating information about the surrounding external environment and stakeholders and making organizations establish alliances in the field of research and development to ensure access to leadership and distinction from their peers.
5. Providing smart, purposeful ideas and activities in order to transform them into innovations and inventions to improve their quality and sustain their outputs.
6. Developing speculative opinions regarding future events for the organization, adopting those events as a basis for problems, and providing proactive strategies to reduce the uncertainty rates of the threats surrounding it currently and in the future.

5) Dimensions of strategic intelligence:

Writers and specialists in the administrative literature unanimously agree that the success of organizations depends on their intelligence in uniquely positioning themselves in front of their competitors, and that strategic intelligence is what they need today to seize their opportunities by being an intelligent system that enhances the capabilities of the organization and its leaders to shape future features. Many experts and researchers in this field have identified the dimensions of strategic intelligence. [1]

Depending on their proportions, which may be appropriate to the current study environment, which is Iraqi private banks, they also share with other study variables in multiple studies to the best of the researcher's knowledge, and on that basis the following dimensions were chosen: [4]

1. Foresight:

The scientific community has become increasingly interested in the topic of foresight and has occupied a wide space in private and public organizations of all sizes, involved in the field of business for all, as this concept has emerged as an organizational force in order to understand the reality of the social and cultural environment, the contexts of competitors, and technological tools to arm the organizations themselves with knowledge and modern techniques to reach Its goals [9]. Organizations began to use this method to conduct surveys, know stakeholders, create value by accessing important resources before entering into competition, and examine emerging fluctuations in the field of service provision to address uncertainties and appropriately anticipate changes in the environment, which makes the organization capable of dealing with opportunities and challenges [5]. Foresight is expressed as recognizing and diagnosing the forces that shape the future and that will bring about change in the organization and is primarily related to future planning and revealing the threats that the organization faces to implement alternative strategies [11]. Foresight is also an essential element in forming an analytical picture of the future with its quantitative and qualitative variables to enable leaders and increase their creative capabilities in making informed decisions to achieve the goals that the organization aspires to [1]. Others define it as identifying, monitoring, and interpreting the factors that induce change, in light of which the organization determines their implications and the extent of the appropriate organizational response to them [5].

2. Organized thinking:

It is the ability to integrate various elements together for the purpose of analyzing them accurately and understanding how they interact to form a system or clear features of the things he deals with [1]. The systems thinking model is linked to many fields, including (operations research, systems analysis, system engineering), and the success achieved by organized thinking in this field led to its transfer to social systems [15]. Also, relying on organized thinking as one of the tools of intelligence The strategy can enhance the characteristics of successful leaders in organizations by forming a clear vision and accurate assessment of the course of events surrounding them, the relationships that arise between the prevailing systems in them, and the results obtained from those relationships [18]. Organized

thinking is also a system based on arranging the information collected, provided, and structuring it according to its importance in order to achieve a comprehensive picture and a deep understanding of the organization for every part of it, and determining the role of other parts to create the strategic framework in which they work, address complexities, and acquire knowledge in an easy way [9].

3. Partnership:

Contemporary organizations have begun to realize that advancing the reality of infrastructure requires going beyond the hierarchical systems of their organizational structures and stimulating their management in a sustainable manner to coordinate and continue dialogue by establishing partnerships with the aim of accessing the best complementary resources that are outside the organization and obtaining the information they need to improve management methods and coordinate internal operations and activities. [1]

The right partner is a critical factor in the success of the organization, and strategic alliances are more effective when partners clarify their vision, values, and goals [14].

Partnership represents the ability to establish cooperative strategic alliances between two or more organizations to exchange information, build a successful business strategy that benefits both parties, and exploit available resources and information to achieve the desired goals [9]. Partnership is also the ability to develop and maintain fruitful relationships and reflects the basic characteristics through which leaders build effective teams and create alliances from the same industry to share resources and develop common strategies for organizing business deals [11]. While some believe that the intention of establishing alliances is Organizing regular business deals that include (joint projects, licenses, equipment agreements) so that the organization maintains its personality and is limited to cooperation in providing consultations or research and development [14].

4. Creativity:

It is the field that relates to presenting new ideas, developing services, and leading work groups to improve services for customers, and it is an idea that is being implemented to develop the process or service [1]. Creativity is one of the most important characteristics that receives the attention of senior management in banks because it is the important element that leads them to progress. Many view creativity as one of the most important factors that help solve problems and it is considered one of the necessary requirements in contemporary management [11]. Drucker pointed out that creativity comes from the elements of ingenuity, knowledge, and talent [9]. The success of organizations is not limited to their efficient performance of work, but also lies in the ability of their leaders who have creative skills to manage their employees, as they are the backbone upon which their business is built and its survival in the development of competition [13]. Others pointed out that there are other factors that characterize creative leaders and are considered one of the reasons behind the existence of the term creativity, including (fluency, flexibility, sensitivity to problems, originality) [1]. Although the field of creativity shares many concepts, including (invention, innovation, research and development), the opinions that crystallized regarding it were in different directions. The first started from individual characteristics (natural innate powers), while the

second trend was represented by it being a form of acquired behavior. Of education and organizational training [16]. Then another trend emerged, considering that creativity emerges as a result of innate talents and is refined through social and cultural conditions in the work environment, and its outcome is creative output. This is in harmony with the nature of strategic intelligence and makes it one of its dimensions, as strategic intelligence is a personal trait that has been associated with leadership and organizational practices and has helped to develop and emerge. That creativity [18].

5- Benchmarking:

It means the organized and continuous process that requires comparison between different trends (organizations, activities, jobs, strategies) with different and distinct sectors in order to reach the best performance [11]. Japan is one of the first to apply and adopt this term with the aim of making improvements. On the organization's operations, benchmarking is an ideal tool to discover performance gaps by focusing on the external environment of competition and identifying new and pioneering ideas from similar organizations [13].

3- The applied aspect of research:

First: Testing the stability of the research measurement tool

It is not enough for the measurement tool to be honest only, but there is another characteristic that must be present, which is reliability. Reliability means that the scale test gives the same results if it is repeated on the same individuals in the same circumstances. Reliability is defined as stability in the results with the presence of a time interval [1]. It is also known as the ratio of the true variance to the total variance, or the square of the correlation coefficient between the real values and the apparent values. Reliability helps in obtaining a statistical indicator through which we judge the accuracy of the measure. This indicator is called the reliability coefficient [2]. The reliability coefficient for the research measurement tool was calculated using the Alpha Cronbach correlation coefficient shown in Table (1).

Table (1) Reliability coefficients for the research measurement tool

variable	Cronbach's Alpha coefficient	dimension variable	cronbach's Alpha coefficient for each dimension
Fourth industrial revolution technologies	0.762	Additive manufacturing	0.857
		Internet of things	0.874
		Advanced robotics	0.730
		3D printer	0.757
		Cloud Computing	0.845
		Cyber systems	0.935
Sustainable operations performance	0.926	Economic performance	0.890
		Social performance	0.950
		Environmental performance	0.816

		Cultural performance	**0.945**
Strategic flexibility	**0.933**	**Competitive flexibility**	**0.924**
		Market flexibility	**0.922**
		Production flexibility	**0.906**
		Resource flexibility	**0.920**
Strategic intelligence	**0.899**	**Organized thinking**	**0.812**
		Partnership	**0.790**
		creativity	**0.814**
		Benchmarking	**0.890**

Source: Prepared by researchers based on the outputs of the SPSS program.

We note from table (1) that the values of the Cronbach's Alpha coefficients were all greater than (0.70), which is the lowest statistically acceptable value [12].Which indicates that the research measurement tool is characterized by accuracy and high stability.

Second: Description of the research variables

In order to describe, diagnose and analyse the statistical results at the level of the research sample company, the responses of the sample members were tabulated in detail at the level of each paragraph of the questionnaire and in general for each of the main research variables with their sub-dimensions for the purpose of treating them statistically through the use of the arithmetic mean, standard deviation, coefficient of variation, and importance. Relative ratio, according to the results of the electronic calculator using (Microsoft Excel) and (SPSS) programs, as the table:

1- Describing and diagnosing the variable technologies of the Fourth Industrial Revolution in its overall dimensions:

Table (2) Descriptive statistics for the Fourth Industrial Revolution technologies variable

dimension variable	mean	standard deviation	variation %	relative importance
Additive manufacturing	**4.38**	**0.73**	**16.86**	**87.62**
Internet of things	**4.30**	**0.75**	**17.45**	**86.07**
Advanced robotics	**4.29**	**0.77**	**17.95**	**85.93**
3D printer	**4.29**	**0.75**	**17.47**	**85.90**
Cloud Computing	**3.98**	**0.94**	**23.79**	**79.74**
Cyber systems	**4.12**	**1.09**	**26.43**	**82.48**
TOTAL	**4.25**	**0.80**	**18.99**	**85.05**

Source: Prepared by the researcher based on the outputs of Microsoft Excel and SPSS.

It is noted from table (2) that the Fourth Industrial Revolution technologies variable achieved a fully weighted arithmetic mean of (4.25), a standard deviation of (0.80), a coefficient of

variation of (18.99%), and a relative importance of (85.05%). These statistical results indicate that the revolution technologies variable The fourth industrial sector received a high degree of importance according to the answers of the sample individuals. As for the relative importance of the dimensions of the technologies of the Fourth Industrial Revolution, the Additive Manufacturing dimension achieved first place, with its relative importance reaching (87.62%), then the Internet of Things dimension came in second place, with its relative importance reaching (86.07%), and the Advanced Robotics dimension achieved third place, where Its relative importance reached (85.93%), then after the 3D printer it ranked fourth, as its relative importance reached (85.90%). Figure (2) shows the ranking of the relative importance of each dimension of the Fourth Industrial Revolution technologies, based on weighted arithmetic means.

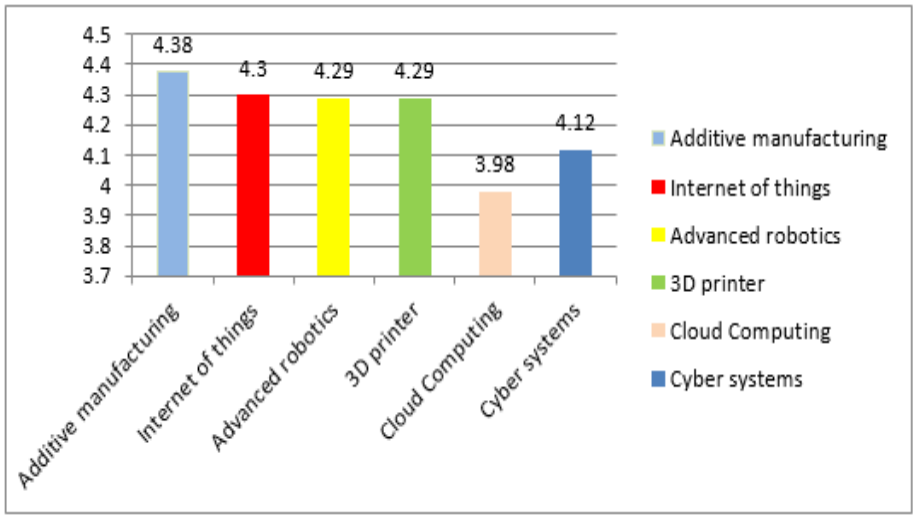

Figure (2) graphical representation of the dimensions of the technologies of the Fourth Industrial Revolution

Source: Prepared by the researcher.

2- Describe and diagnose the sustainable operations performance variable

The variable of sustainable operations performance in the field was measured through four sub-dimensions, which are as the table:

dimension variable	mean	standard deviation	variation %	relative importance
Economic performance	**4.17**	**0.92**	**22.19**	**83.54**
Social performance	**4.10**	**0.91**	**22.32**	**82.11**
Environmental performance	**4.05**	**0.93**	**23.11**	**81.10**
Cultural performance	**3.99**	**0.96**	**24.09**	**79.95**
TOTAL	**4.09**	**0.96**	**23.63**	**81.83**

Source: Prepared by researchers based on the outputs of Microsoft Excel and SPSS.

It is noted from table (3) that the sustainable operations performance variable achieved a fully weighted arithmetic mean of (4.09), a standard deviation of (0.96), a coefficient of variation of (23.63%), and a relative importance of (81.83%). These statistical results indicate that the sustainable operations performance variable It received a high degree of importance according

to the answers of the individuals in the research sample. As for the relative importance of the dimensions of sustainable operations performance, economic performance ranked first, with its relative importance reaching (83.54%). Figure (3) shows the order of relative importance of each dimension of sustainable operations performance based on weighted arithmetic means.

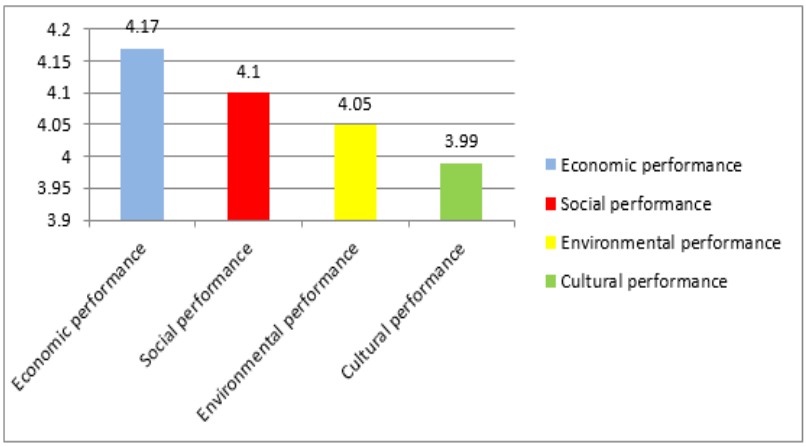

Figure (3): Graphical representation of the dimensions of sustainable operations performance

Source: Prepared by the researcher.

3) Describe and diagnose the strategic flexibility variable in detail:

The strategic flexibility variable was measured in the field through four sub-dimensions, which are as follows:

Table (4) Descriptive statistics for the strategic flexibility variable

dimension variable	mean	standard deviation	variation %	relative importance
Competitive flexibility	**3.71**	**1.05**	**28.37**	**74.33**
Market flexibility	**3.68**	**1.18**	**32.25**	**73.77**
Production flexibility	**3.75**	**1.24**	**33.22**	**75.09**
Resource flexibility	**3.85**	**1.16**	**30.13**	**77.00**
TOTAL	**3.75**	**1.03**	**27.61**	**75.05**

Source: Prepared by the researcher based on the outputs of Microsoft Excel and SPSS.

It is noted from Table (4) that the strategic flexibility variable achieved a fully weighted arithmetic mean of (3.75), a standard deviation of (1.03), a coefficient of variation of (27.61%), and a relative importance of (75.05%). These statistical results indicate that the strategic flexibility variable achieved It has a high degree of importance according to the answers of the individuals in the research sample. As for the relative importance of the dimensions of strategic flexibility, the resource flexibility dimension ranked first, with its relative importance reaching (77.00%), then the production flexibility dimension came in second place, where its relative importance reached (75.09%), and the competition flexibility dimension achieved third place, where its importance reached Relative importance (74.33%), and then

came in fourth and last place after market flexibility, where its relative importance reached (73.77%). Figure (4) shows the ranking of the relative importance of each dimension of strategic flexibility based on weighted arithmetic means.

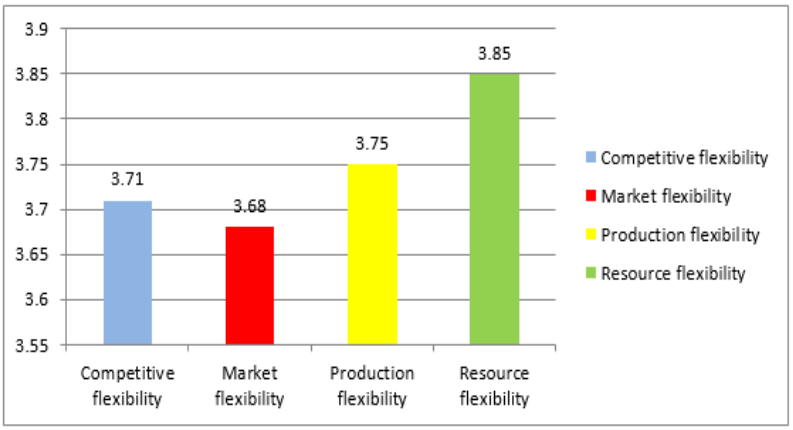

Figure (4): Graphical representation of the dimensions of strategic flexibility
Source: Prepared by the researcher.

5) Describe and diagnose the strategic intelligence variable:

The strategic intelligence variable was measured in the field through four sub-dimensions, which are as the table:

Table (5): Descriptive statistics for the strategic flexibility variable

dimension variable	mean	standard deviation	variation %	relative importance
Organized thinking	**3.80**	**1.03**	**30.37**	**74.50**
Partnership	**3.99**	**0.96**	**24.09**	**79.95**
Creativity	**4.10**	**0.91**	**22.32**	**82.11**
Benchmarking	**3.85**	**1.16**	**30.13**	**77.00**
TOTAL	**3.75**	**1.03**	**27.61**	**75.05**

Source: Prepared by the researcher based on the outputs of Microsoft Excel and SPSS.

It is noted from Table (5) that the strategic intelligence variable achieved a fully weighted arithmetic mean of (3.75), a standard deviation of (1.03), a coefficient of variation of (27.61%), and a relative importance of (75.05%). These statistical results indicate that the strategic intelligence variable had It has a high degree of importance according to the answers of the individuals in the research sample. Figure (5) shows the ranking of the relative importance of each dimension of strategic intelligence based on weighted arithmetic means.

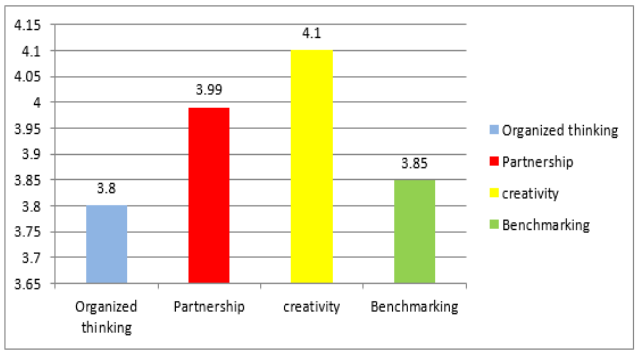

Figure (5) graphical representation of the dimensions of strategic intelligence

Source: Prepared by the researcher.

CONCLUSIONS

This study presents the most important field conclusions that resulted from (constructive validity tests, description and diagnosis of research variables, testing of research hypotheses). They explain the results of the statistical analysis and clarify the nature of the relationship that links the research variables. Therefore, they reflect the summary of the field efforts exerted in preparing this research, represented by: The following:

1. The measures of the research variables represented by (Fourth Industrial Revolution technologies, sustainable operations performance, strategic flexibility and strategic intelligence) achieved good levels of confirmatory construct validity. This indicates the accuracy of the intellectual and cognitive constructions of these variables and at the same time confirms the matching of the measures of the research variables with the data collected about The answers of the research sample members, and thus this confirms the strength of the relationship between the dimensions of the research variables and their items, and that the dimensions were measured by a clear and appropriate number of items.

2. The measures of the research variables achieved high levels of stability, and this indicates the accuracy and effectiveness of these measures in measuring the research variables clearly without any interference or complexity, which confirms the possibility of achieving the same results if the test is repeated several times on the same sample members in the researched company.

3. The Fourth Industrial Revolution technologies variable achieved a high level of importance for the research sample company, and the high level of importance of this variable is due to what was achieved by the results of the descriptive statistics for the sub-dimensions of the Fourth Industrial Revolution technologies.

4. The Additive Manufacturing dimension achieved the highest level of importance within the dimensions of Fourth Industrial Revolution technologies, then the Internet of Things dimension ranked second, the Advanced Robotics dimension achieved third rank, then the 3D printer dimension achieved fourth rank, and the Cloud Computing dimension ranked fifth, but with a high level of importance as well. .

5. The sustainable operations performance variable achieved a high level of importance at the level of the company in the research sample, and the high level of importance of this variable

is due to what was achieved by the results of the descriptive statistics for the sub-dimensions of sustainable operations performance.

6. The strategic intelligence variable achieved a fairly high level of importance, and this reflects the extent of the importance of this variable on the ground at the level of the research sample company, and the high level of importance of this variable is due to what was achieved by the results of the descriptive statistics for the sub-dimensions of strategic intelligence.

RECOMMENDATIONS

Based on the conclusions reached by the current research, this study came to present a set of recommendations related to the research variables in the hope of benefiting from them in the company that is the research sample, and then provided researchers and those interested in the literature of administrative thought with a set of proposed topics to be future studies and research that are extended and complementary to the current research, as follows: :

1. The managements of the company, the research sample, should employ the dimensions of the technologies of the Fourth Industrial Revolution in all of its activities and educational processes because they contribute significantly to increasing work efficiency and providing more opportunities, as well as enhancing the organization's performance and value among competing organizations.
2. Encouraging employees to be creative in order to bring about more positive changes in quality and performance, as creativity is considered the main engine that improves the reality of educational organizations and places them in advanced competitive positions.
3. It is necessary for the departments of the company, the research sample, to exploit the energies and capabilities of employees in continuous renewal and development in order to adapt to environmental and competitive changes and enhance their organizational performance, especially when industrial organizations are facing two types of competition, namely intellectual competition and profit competition.
4. The research sample company should attract employees with high academic and cognitive qualifications for the purpose of achieving excellence and excellence.
5. Develop effective training strategies and hold courses and seminars in order to ensure continuous updating of employees' cognitive capabilities and raise the level of their competencies and skills.
6. The managements of the research company should allocate material and in-kind rewards and incentives to the employee who achieves superior scientific successes in order to raise the level of work efficiency to achieve creativity and excellence.

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