The Impact of the Application of Artificial Intelligence on Decision-Making "Applied Study on Saudi Government Hospitals in Najran region"

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Abstract: The study aimed to explanation of the impact of the application of artificial intelligence on decision-making at Saudi government hospitals in Najran region. The study adopted the descriptive analytical approach to show and describe artificial intelligence and its impact on decision-making at Saudi government hospitals in Najran region. The study used an electronic questionnaire that was applied to (297) employees at Saudi Government Hospitals in Najran region. The study results showed that there is a high degree of appreciation for artificial intelligence at Saudi government hospitals in Najran region, where this is due to the efficiency of its dimensions. The study showed that the Smart Agents was in the first rank, in the second rank came the Expert Systems, and in the third rank was Genetic Algorithms, where these dimensions were at a high level of appreciation. Moreover, in the fourth and last rank was the Neural Networks, at moderate level of appreciation. These results indicate a high degree of Artificial intelligence at Saudi governmental hospitals in Najran region. The study also found a statistically significant effect at the significance level ($0.05 \geq \alpha$) of Artificial Intelligence (Expert Systems, Neural Networks, Genetic Algorithms, Smart Agents) on Decision-Making in Saudi governmental hospitals in Najran region. In light of the results, the study recommended enhancing the use of artificial intelligence in the decision-making process at Saudi hospitals.

Keywords: Artificial Intelligence, Decision-Making, Saudi Government Hospitals in Najran.

Introduction:

The decision-making process in any organization is a challenge to administrations and decision-makers, as it is directly related to achieving the organization's goals, managing the organization's affairs and solving problems, in addition to analyzing the problem and situation, as well as diagnosing various factors and possible outcomes, given the multiplicity of options and alternatives (Baadji, 2020).

The beginning of the twenty-first century witnessed technological developments in various areas of life, which are increasing rapidly day by day, which have affected the business and various processes in institutions. Artificial intelligence is the most important form of technological development in the business and institutions, which it introduced modern methods in management and administration processes in various fields and disciplines, and the use of the latest devices and technologies to improve performance (Reguig, 2015).

Technological developments are considered an intellectual capital for institutions and an organizational asset for them, as the speed of technological developments has forced institutions to attempt hard to keep pace with them and benefit from them in their various operations, in addition to facilitating the process of collecting, storing and reusing information, which helps the institution's departments in making appropriate decisions, especially in critical circumstances (Turshani, 2014).

Many organizations, in all their fields and specializations, depend on artificial intelligence and its forms in daily operations, as artificial intelligence contributes to providing the necessary data and information in the least time and effort, which helps the organization to solve problems andmake the right decisions to ensure the existence and development of the organization (Almansoori and Al-Tahitah, 2021).

Due to the importance of artificial intelligence and its multiple forms and the contributions it provides to the various processes within the organization, decision makers in organizations at all levels need an interactive system that meets their needs to provide information, introduce new variables, or make changes in the assumptions related to the problem and put forward a set of scenarios that help the decision maker in Choosing the most appropriate solutions without referring to specialists in information analysis (Haida and Kadi, 2020).

According to Dietzmann and Duan (2022), it is useful for artificial intelligence to support managers in recognizing patterns to formulate a vision for the organization and mitigating its problems, as well as eliminating trust problems, in addition to that decision-making based on artificial intelligence reduces the importance of subjective and unpredictable standards and enhances objective and predictable standards.

Based on the foregoing, it is worth noting the optimal use and selection of appropriate methods and forms of artificial intelligence and technological development to be used in institutions in order to support and enhance various processes, especially the decision-making process.

Aim of study:

The main objective of the study is explanation of the impact of the application of artificial intelligence on decision-making in Saudi government hospitals in Najran region.

Objectives:

Based on the main objective, the following objectives:

1.Explanation of the extent to which the Ministry of Transport in the Kingdom depends

on application of artificial intelligence on decision-making in Saudi government hospitals in Najran region.

2. Measuring the efficiency of decision-making in Saudi government hospitals in Najra region.
3. Analysis of the impact of the application of artificial intelligence on decision-making in Saudi government hospitals in Najran region.

Hypothesis:

Main hypothesis:

H1: There is a statistically significant effect at the significance level ($0.05 \geq \alpha$) of Artificial Intelligence (Expert Systems, Neural Networks, Genetic Algorithms, Smart Agents) on Decision Making in Saudi governmental hospitals in Najran region.

Sub hypothesis

There is a statistically significant effect at the significance level ($0.05 \geq \alpha$) of Expert Systems, on Decision-Making in Saudi governmental hospitals in Najran region.

There is a statistically significant effect at the significance level ($0.05 \geq \alpha$) of Neural Networks on Decision-Making in Saudi governmental hospitals in Najran region.

There is a statistically significant effect at the significance level ($0.05 \geq \alpha$) of Genetic Algorithms on Decision-Making in Saudi governmental hospitals in Najran region.

There is a statistically significant effect at the significance level ($0.05 \geq \alpha$) of Smart Agents on Decision-Making in Saudi governmental hospitals in Najran region.

Artificial Intelligence

The term Artificial Intelligence (AI) was used and accepted for the first time with the invention of robots. But, "Artificial Intelligence" defined for the first time in 1955 by John McCarthy as "the science and engineering of making intelligent machines" (Hamet and Tremblay, 2017).

Artificial intelligence described the first field of computer and machines sciences, dealing with all characteristics of representing cognitive functions for actual problem solving and building systems that learn and think like human (Holzinger et al., 2019).

Early AI systems were mainly logical and symbolic by performing some form of logical implication and could provide a trace of their implication steps, which became the basis for explanation, but they fell short of user needs for comprehension. However, Recent AI systems are more successful due to new machine learning techniques that construct models in their internal representations (Gunning and Aha, 2019).

As well as, in recent years, AI has attracted attention as a key for growth in developed countries, the attention is mainly focused on developing new artificial intelligence information communication technology and robot technology that supports daily social life and economic activities (Lu et al., 2018).

The beginning of the 20th century witnessed key developments in artificial intelligence and robotics that lead to future progress to be even more spectacular. But such developments and progresses in AI technologies reflected high levels

of anxiety about automation and other technological trends, underscoring the widespread concerns about their effects (Acemoglu and Restrepo, 2017).

However, artificial intelligence poised to influence almost every aspect of human (social, economic, health, education) by providing various tools to increase the effectiveness of results of human's performance (Johnson et al., 2018).

Haenlein and Kaplan (2019) indicated that artificial intelligence described the ability of a system to interpret external data correctly and to learn from such data, as well as to use those learnings to achieve specific goals and tasks through flexible adaptation.

In addition, AI described the ability of a machine to reproduce intelligent human behavior to achieve goals in a wide range of environments, also to change the process by which we create new ideas and technologies, helping to solve complex problems and scaling creative effort (Aghion et al., 2017).

The rapid development of AI represents a great deal of interest in the commercial potential of AI, which is attracting significant sums of venture capital and state-sponsored investment globally like China in particular (Venkatasubramanian, 2019).

As well as, artificial intelligence advance and progress have deep effects for the economy and society. These innovations have the potential to directly influence both the production and the characteristics of a wide range of products and services, with important implications for productivity, employment, and competition (Cockburn et al., 2017).

Therefore, artificial intelligence known sometimes as the fourth industrial revolution that is going to change the way we do things and how we relate to others. Simply AI is the intelligence that designed by humans and demonstrated by machines and technologies (Tai, 2020).

At the level of institutions and the administrative aspect, artificial intelligence contributes to enhancing the capabilities of employees and departments to develop and improve performance and raise the quality of services and products provided, which ensures customer satisfaction and improves the organization's position within the competitive environment, through data collection, analysis and use that lead to deal with challenges (Dirican, 2015) .

Artificial intelligence tools and technologies play an important role in influencing the course of operations within any organization, whatever its specialization and field of business, by facilitating the decision-making process resulting from a clearer vision of the conditions that the organization is exposed to, as well as improving the performance of workers and creating a positive interactive environment among them (Luo et al., 2019).

Thus, artificial intelligence is reshaping economies and societies by introducing new products and services that contribute to productivity gains by increasing efficiency and reducing costs (Lane and Saint-Martin, 2021).

On the other hand, recent and rapid developments in information, computer technologies and software have affected all areas of life, business and institutions, and since the health sector and its institutions are among the most important criteria that reflect the growth of the state, it is one of the first sectors that initiated the use

of modern technologies and information systems and worked to develop them. This is because of its importance in facilitating operations related to data and information, supporting medical personnel in making appropriate decisions to provide health services, as well as assisting departments in developing future strategic plans for the institution (Dilsizian and Siegel, 2014).

Decision Making

The decision-making process is linked to the work of strategic management through the sequence of work that bridges the gap between the current and future state of the organization. In addition, the formulation and implementation of decisions is a central management activity for all types of organizations: large or small, private or public, for-profit or not-for-profit (Manolopoulos et al., 2022).

The decision-making process in any organization is considered one of the most important administrative processes, and therefore it is directly related to the achievement of the goals of the Organization , in addition to that it takes the largest part of the tasks of managers, regardless of their positions or levels in the organization, as the decision-making process depends on the ability and competence of managers and their understanding of administrative decisions and methods (Ihsan et al., 2021).

Managers face challenges and obstacles in making decisions, as they are considered the essence of analysis in any issue, problem or situation, and the decision-making process becomes more difficult in light of sudden circumstances and emergency crises that need quick remediation and effective and correct decisions within a short time (Stiegler and Tung, 2014).

Such challenges and obstacles that facing managers in decision-making revealed the need for an effective management emerged represented in cooperation and exchange of ideas and opinions to reach an effective solution and decision commensurate with the circumstances the organization is going through and with its objectives, as the exchange of opinions and ideas shows better results in the decisions taken (Hsieh et al., 2020) .

However, the decision-making process is implemented effectively in the institutions by defining priorities to accomplish more work and goals with the least effort and the shortest time, as well as by following an administrative method and approach that helps departments in making the right decisions in accordance with the objectives of the institution and the needs of employees and customers, in addition to dealing with variables and circumstances properly (Bell and Reed, 2021).

Thus, we can indicated that the concept of decision making is the process by which an individual, group or organization comes to conclusions about future actions to pursue given a set of goals and limitations of available resources.

Importance of Decision-Making Process

In general, decision-making expresses choosing the best available alternatives after analyzing and evaluating the results and values arising from each alternative, and since the succe of any organization depends on the efficiency of its managers in decision-making, most management scholars emphasize that information is the cornerstone of decision-making and to the extent that it is accurate, comprehensive, and timely, the decision taken is correct and contributes to achieving the objectives of the institution (Koziol-Nadolna and

Beyer, 2021).

The administrative decision-making process is one of the most important decisions taken by the manager in the organization, as decision-making is considered the core of the administration (Panpatte and Takale, 2019).

In addition, decision making represents the intellectual process that helps in choosing the course of action and the most appropriate alternative among several possible alternatives (Kadoić et al., 2016).

Also, the ability to make decisions is essential in developing the responsibility of managers and individuals in all departments of the organization, which in turn leads to the success of the organization in achieving its desired goals. Therefore, the administrative decision-making process is a human activity that requires organized and conscious thinking by investing the accumulated experience and information in order to face situations and problems (Kaşkaya et al, 2017).

However, the elements of the administrative decision are of great importance in achieving the benefit of the decision. Therefore, the decision-maker must accurately define the problem and think about the many available alternatives and choose the most appropriate alternative, and then work on studying it and subject it to a careful study and then review the costs of its implementation, and it must also be ensured that it achieves the highest benefit, and make sure that it can be applied on the ground in order to achieve the desired goal in accordance with the institution's management and plans (Elezaj et al, 2021).

In addition, there is also an importance according to administrative law; which is represented in the exploitation of administrative decisions as a successful legal tool, and important for the completion of special activities in the administrative professions (Rabab'h et al, 2019).

Decisions Classifications

The classification process for the types of decisions is not subject to fixed criteria and considerations, just as the classification process itself is subject to multiple considerations and factors stemming from the nature of the decision-making process and its multiplicity of aspects.

However, these classifications do not represent all types of administrative decisions, despite the multiplicity of classifications (Shahsavarani & Abadi, 2015).

There are many classifications under which the types of decisions fall, including the following as described by Sulich et al. (2021):

Planned and Non-Planned Decisions: where programmed decisions represent those that are taken routinely or repeatedly, are taken in specific situations, and are subject to certain rules, while non-programmed decisions represent those decisions that predetermined rules and procedures cannot be applied.

Organizational and Personal Decisions: these are the decisions taken mostly by heads of departments, departments, or the so-called middle management. These decisions often aim at taking appropriate alternatives and means to achieve goals, translate plans, or build an organizational structure.

Administrative Decisions: which are entrusted to managers at the level of middle management, whereby managers make decisions to solve problems of organization,

control and performance, according to which they ensure that resources have been obtained and used efficiently and effectively in achieving the goals of the organization such as forecasting sales.

On the other hand, the decision-making process may face many obstacles during its initiation or after its implementation, such as administrative problems and obstacles stemming from the development of administrative leaders related to the performance of management and individuals and their impact on decision-making (Parnell, et al, 2011).

Haynes (2015) indicated that the inability of administrative leaders to solve the complex problems they face in light of the stages of change and development witnessed by the administrative apparatus is one of the most important problems and obstacles facing the decision-making process, as well as the lack of competencies and leadership cadres, which contributes significantly to the increase in problems and obstacles facing the decision-making process. Likewise, the lack of information necessary for decision-making is one of the most important factors that affect the safety and effectiveness of the decision-making process, because it is primarily related to management information systems for collecting correct, accurate, and sufficient information for making sound decisions.

Previous Studies:

Al Azzam and Al Dafra (2022) The Impact of the Application of Artificial Intelligence on the Quality of Decision-Making in the Emirate of Asir Region During the Covid-19 Epidemic

The study aimed to identify the role of artificial intelligence in making administrative decisions in the Emirate of Asir region. The study sample consisted of 200 employees of the Asir region.

The study relied on the questionnaire as a tool for data collection. The study used the descriptive correlative method. The results of the study showed a positive, direct correlation between the application of the artificial intelligence method and the quality of administrative decisions, due to the inability of the manager to take the administrative decision in isolation from the use of artificial intelligence tools and methods in light of the multiplicity of levels and administrative functions.

As well as the existence of a relationship between the use of artificial intelligence methods and the quality of administrative decision-making. However, the study recommended the need to develop the skills of workers in order to deal with the different methods of artificial intelligence, and to work on identifying the scientific and objective foundations to be adopted in decision-making.

Yu and Li (2022) Artificial Intelligence Decision-Making Transparency and Employees' Trust: The Parallel Multiple Mediating Effect of Effectiveness and Discomfort The study aimed to reveal the impact of transparent decision-making in artificial intelligence on human confidence in artificial intelligence from both cognitive and emotional perspectives.

The study sample consisted of 235 participants with previous work experience. The study relied on the method of completing an online experimental essay. The results showed that perceived transparency of employees, perceived effectiveness of employees of AI, and employee dissatisfaction with AI played mediating roles in the relationship between transparency of AI decision-making and employee confidence in AI, the

transparency of AI decision-making (versus opacity) resulted in higher perceived transparency, which in turn increased effectiveness (which enhanced trust) and discomfort (which impeded trust). The study showed that this research is of practical importance because it provides suggestions for organizations to improve employee confidence in AI so that employees can better collaborate with AI.

Al Darwish (2021) The Effect Of Artificial Intelligence In Smart Decision-Making In The UAE Government The study aimed to investigate the effectiveness of using artificial intelligence in smart decision-making in the UAE government to improve service quality, increase transaction efficiency, reduce costs, and increase revenue. The study sample consisted of 40 decision makers in government departments in the UAE government. The study relied on data collection on interviews and questions. The results of the study showed that artificial intelligence represents the most important results of the Fourth Industrial Revolution because of its multiple uses in the military, industrial, economic, technical, medical, educational and service fields, and the adoption of artificial intelligence in the provision of government services is positively related to customer satisfaction and improving customer experience results. The study also showed a high awareness (75-85%) about the use of artificial intelligence in the provision of government services as well as to improve customer service.

Almansoori and Al-Tahitah (2021) The Role of Artificial Intelligence in The Decision-Making Process at The Ministry of Interior in The United Arab Emirates It aimed to discuss the decision-making process and the employment of artificial intelligence in the United Arab Emirates, and it is part of an expanded study that extends to the year 2031 AD.

The study relied on a questionnaire utilizing studies to collect data. The descriptive analytical method was used. The results of the study showed that the UAE's strategy in artificial intelligence targets vital sectors, the most important of which are: the transportation sector by reducing accidents and operational costs, the health sector by reducing the percentage of serious diseases, as well as the energy sector by managing facilities and consumption, in addition to the traffic sector by developing preventive mechanisms that include forecasting accidents and congestion .

Moulai et al. (2021) Application of Artificial Intelligence and Emotional Intelligence on Decision-Making

The study aimed to find out the impact of the application of artificial intelligence and emotional intelligence on decision-making in commercial banks. The study sample consisted of 162 employees of commercial banks. The study relied on a questionnaire to collect data. The descriptive analytical method was used. The study reached a set of results, the most important of which are: there is a link between artificial intelligence and administrative decision-making, and there is a role for artificial intelligence techniques in developing banks and keeping pace with developments to achieve goals, and that there is a negative correlation between artificial intelligence and administrative decision-making, and there is a negative correlation between emotional intelligence and administrative decision-making. The study presented a set of recommendations, the most important of which are: holding training programs for employees to provide them with emotional intelligence skills, and providing programs to develop decision- making skills, as well as using experts specialized in the field of emotional intelligence to train

employees on how to use it and employ it in the decision-making process, in addition to the need to monitor the decision-implementation process .

Haida and Kadi (2020) The use of Artificial intelligence applications in the firm (Adrar Electricity and Gas Production Company

The study aimed to know the role of using artificial intelligence applications in improving the decision-making process in the economic institution (Adrar Electricity and Gas Production Company). The study sample consisted of 70 employees. The study adopted the questionnaire as a tool for data collection. The study used the descriptive and analytical method to analyze the data.

The results of the study showed that there is an impact of the use of artificial intelligence applications in its three dimensions (training and development, appropriateness, effectiveness) in improving the decision-making process in its dimensions (time dimension, decision quality, decision acceptance), as well as that the decisions taken and based on customer needs and related to artificial intelligence applications leads to excellence in service provision. The study recommended the necessity of training and training human resources and attracting experts and specialists in the field of decision support systems, and the necessity of keeping pace with institutions with developments in the field of information and modern technology.

El-Emary et al. (2020) The Effect of Using Artificial Intelligence on the Quality of Decision-Making in Various Organizations: A Critical Survey Study The current study aimed to identify the case of previous studies related to the topic of the impact of artificial intelligence on the quality of decision-making in organizations, and to provide a critical review of them. In order to achieve the goal of the study, descriptive, analytical and documentary methods were used. The results of the study showed that the use of artificial intelligence techniques positively affects the accuracy and quality of decision-making in the various forms of these organizations, regardless of their structure. The study also found a set of common techniques and algorithms for artificial intelligence that can be used to improve the quality of the decision-making process, the most important of which are: Support Vector Machine, Artificial Neural Networks, Back-propagation neural networks, Bayesian networks.

The study recommended the necessity of conducting more empirical and exploratory studies on the impact of the application of artificial intelligence on the quality of decision-making within organizations.

It also recommended the design of models and action plans related to the use of artificial intelligence in decision-making in order to facilitate its use in implementation, understanding and analysis of its results.

Schmidt (2019) The Impact of Artificial Intelligence on Decision-Making in Venture Capital Firms The study aimed to investigate the opportunity of artificial intelligence in the decision-making process in venture capital. In collecting data, the study relied on 12 interviews with venture capital investors, artificial intelligence experts, and companies that provide venture capital solutions, as well as secondary data in the form of academic articles and online journals. The study used a qualitative analysis. The results showed that artificial intelligence is often implemented at the beginning of the decision-making process, and the use of artificial intelligence improves decision-making process by

reducing uncertainty and bias and increasing productivity and efficiency. The results also revealed that artificial intelligence can be implemented at every step in the decision-making process in addition, by applying AI, venture capitalists improve the decision-making process, which may ultimately have a positive impact on the return on their investment portfolio. The study recommended the need to present new studies and research on the impact of artificial intelligence on the decision - making process related to investment capital during the next 5 years, with the need to increase the number of the sample.

Methodology (method and procedures):

The study uses the descriptive analytical approach to show and describe the study variables and to show artificial intelligence and its impact on decision-making in Saudi government hospitals in Najran region.

The Study Population and Sample:

The population of the study includes all employees at Saudi Government Hospitals in Najran region; a random sampling method was used.

According to : Sekaran, U., & Bougie, R. (2014) The sample size was determined according to the following table:

Table (1)

Sample size

Table for Determining Sample Size from a Given Population

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

N is population size.
S is sample size.

The study population has more than 10,000 employees in hospitals in Najran region, and accordingly the sample number is (300). The questionnaire, the study tool was distributed electronically to the members of the study community, where (297) questionnaires were collected from of the study sample.

Description the study sample characteristics:

The frequencies and percentages of the study sample characteristics were found as follows:

Table (3)

Samples characteristics

The Characteristics		Frequency	Percent %
Gender	Male	144	48.5
	Female	153	51.5
	total	297	100
Education level	Diploma or less	39	13.1
	Ba	150	50.5
	Master's	107	36.0
	PhD	1	3
	Total	297	100
Experience	Less than 5 years	38	12.8
	5-under 10 years	114	38.4
	10-under 15 years	145	48.8
	15 years and over	0	0.0
	Total	297	100.0

Table (2) shows that (51.5%) of the study sample employees at Saudi Government Hospitals in Najran region was female, while male represented (48.5%) of the study sample.

Table (2) also shows that (50.5%) hold Ba degree, (36%) of the samples hold Master's degree, (13.1%) of the samples hold Diploma or less degree, while only one (0.3%) of the study sample hold PhD degree.

In addition, table (2) Shows that (48.8%) of the samples have (10-under 15 years) experience, (38.4%) of the samples have (5-under 10 years) experience, and (12.8%) of the study sample

have (less than 5 years) experience at Saudi Government Hospitals in Najran region was female.

Statistical tools:
Based on SPSS, the following tests will be conducted:
- percentages and frequencies.
- Arithmetic mean and standard deviations.
- Multi regression test was adopted.

The reliability of the study tool:
The Reliability Test, which represented by calculating the Cronbach-Alpha coefficient, was carried out in order to verify the internal consistency of the variables included in the questionnaire as a measurement tool. The reliability test conducted for each variable of the study to ensure the level of reliability according to the main variables of the study. Table (3) shows the test results as follows

Table (3)
Reliability Test

Variable		Paragraphs No.	Cronbach's Alpha
	Expert Systems	5	72.2%
	Neural Networks	5	75.1%
	Genetic Algorithms	4	48.1%
	4 Smart Agents	4	83.9%
Decision-Making		6	86.4%
Total		24	93.1%

Table (3) indicates a high reliability of all study variables and the total in general, as the value of (Cronbach's Alpha) was more than the value (60%) for each variable and for all variables of the study scale.

Ethical consideration:
- The data was anonymous.
- The data was used for research purposes only.
- Hospital approval was obtained from ethics to conduct the study there.
- A consent form was taken from all study participants.

Definitions of Terms:
Artificial Intelligence: "It is the ability of the machine to perform the cognitive functions that we associate with human minds, and it is a gradual technological development made possible through access to large amounts of data and new capabilities in processing these volumes of data" (Burgaddad and Moussaoui, 2021: 8).
Decision Making: "A mental process that aims to solve a problem by choosing the most appropriate alternative among the available alternatives under possible conditions to achieve the desired goals" (Farrah, 2020: 28).

Results:

The Independent Variable: Artificial intelligence:

Independent variable consists of four dimensions (recruitment strategy, training strategy, motivation strategy, and performance appraisal strategy). Table (4) indicates the arithmetic means and standard deviations for each variable of Artificial intelligence, where each variable were arranged descending according to the degree of appreciation based on the arithmetic means as follows:

Table (4)

Means and Std. Deviation of Artificial intelligence arranged descending

NO.	Statement	Mean	Std. Deviation
4	**Smart Agents**	3.897	0.732
1	**Expert Systems**	3.722	0.610
3	**Genetic Algorithms**	3.696	0.817
2	**Neural Networks**	3.569	0.810
Average		**3.721**	**0.742**

Table (4) indicates the attitudes of the sample towards questionnaire statements of Artificial intelligence at Saudi Government Hospitals in Najran region; Arithmetic mean (3.721), S.t (0.742) (high appreciation).

The table noted that the first rank in Artificial intelligence was Smart Agents with mean reach (3.897) Std. (0.732) at high degree of appreciation. Next was Expert Systems with mean reaches (3.722) Std. (0.610) at high degree of appreciation. In the third rank came Genetic Algorithms with mean reaches (3.696) Std. (0.817) at high degree of appreciation. The last rank was for Neural Networks with mean reaches (3.569) Std. (0.810) at moderate degree of appreciation.

The Dependent Variable: Decision-Making:

To identify Decision-Making at Saudi Government Hospitals in Najran region, Means and Std. Deviation were applied, where table (5) shows the results:

Table (5)

Means and Std. Deviation of Decision-Making

No.	Statement	Mean	Std. Deviation	Rate

19	The administration determined the problem is to make a decision.	**3.664**	**0.872**	moderate
20	The administration identifies the problem elements for decision.	**3.720**	**0.770**	High
21	The administration collects sufficient information about the problem for decision.	**3.935**	**0.722**	High
22	The hospital analyzed the alternatives to make its decision.	**3.826**	**0.781**	High
23	The administration analyzes alternatives to make decision.	**3.895**	**0.737**	High
24	The administration usually makes the most efficient decisions.	**3.789**	**0.777**	High
Average		**3.805**		High

Source: prepared by the researcher based on the field study

Table (5) indicates the attitudes of the sample towards questionnaire statements of the Decision- Making at Saudi Government Hospitals in Najran region; Average mean (3.805) (High appreciation).

Table (5) noted that Decision-Making means ranged [3.664-3.935] and at between moderate-high degree of appreciation. The results showed that paragraph (21) has the highest level of appreciation, which stated "The administration collects sufficient information about the problem for decision", with mean reached (3.935), Std. Deviation (0.722) at high level of appreciation.

Paragraph (17), was at the lower level which stated, "The administration determined the problem is to make a decision", where the mean was (3.664) Std. Deviation (0.872) at moderate level of appreciation.

The study hypotheses Test:

The Main Hypothesis:

H0: There is a statistically significant effect at the significance level ($0.05 \geq \alpha$) of Artificial Intelligence (Expert Systems, Neural Networks, Genetic Algorithms, Smart Agents) on Decision-Making in Saudi governmental hospitals in Najran region.

To test this hypothesis, multi regression used to find out if there is a statistically significant effect of Artificial Intelligence (Expert Systems, Neural Networks, Genetic Algorithms, Smart Agents) on Decision-Making at Saudi governmental hospitals in Najran region, at significance level ($\alpha \leq 0.05$).

Model Summary:

Table (6)

Model Summary main hypothesis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.842[a]	.709	.705	.32578

a. Predictors: (Constant), Smart, Expert, Neural, Genetic Source: prepared by the researcher based on the field study

Table (6) shows the value of the Regression coefficient between the independent & dependent variable, reaching its value (0.842) as shown, the value of the coefficient of determination (R^2) reaches value of (0.709), which indicates that (70.9%) of changes in dependent variable caused by independent variables.

Table (7) represents the results of analysis of independent variables (Expert Systems, Neural Networks, Genetic Algorithms, Smart Agents) on Decision-Making to test the significance of regression model:

Table (7)

ANOVA[a] independent variables on Decision-Making

Model		Sum of Squares	df	Mean Square	F	sig
1	Regression	75.283	4	18.821	177.332	.000[b]

a. Dependent Variable: Decision
b. Predictors: (Constant), Smart, Expert, Neural, Genetic Source: prepared by the researcher based on the field study

Table (7) analysis of variance, which aims to identify the explanatory model of independent
variable Artificial Intelligence on Decision-Making through examined (F).

The Examined (F) value was equal to (177.332) with possibility value (0.00) which is lower thanthe specific value (0.05), which shows that there is a significant effect exists at significance level ($\alpha \leq 0.05$).

Therefore, we reject the null hypothesis and accept the alternative:

There is a statistically significant effect at the significance level ($0.05 \geq \alpha$) of Artificial Intelligence (Expert Systems, Neural Networks, Genetic Algorithms, Smart Agents) on Decision-Making in Saudi governmental hospitals in Najran region.

Thus, it can be said that at least one variable of independent variables could have significant effect on dependent variable, and this is determined by a significant multiple regression test equation coefficients.

Multivariate Regression Morality:

Table (8) shows the values of the regression coefficients for the the statistical tests.

Table (8)
Coefficients Multiple Regression between the independent variables and Decision-Making

Sig. t	Unstandardized Coefficients		Standardized Coefficients	Model
	B	Std. Error	Beta	
(Constant)	.399	.217		1.839.067
Expert Systems	-.011	.045	-.008	-.254.800
Neural Networks	.170	.051	.164	3.363.001
Genetic Algorithms	.328	.046	.369	7.212.000
Smart Agents	.418	.043	.417	9.765.000

a. Dependent Variable: Decision
Source: prepared by the researcher based on the field study

Sub Hypothesis:
H01: There is a statistically significant effect at the significance level (0.05 ≥ α) of Expert Systems on Decision-Making in Saudi governmental hospitals in Najran region.
The table (8) indicates that Expert Systems did not have a statistically significant effect on Decision-Making in Saudi governmental hospitals in Najran region. The calculated value of (T) was (0.254), which is lower than its tabular value (1.984) at significance level (0.800), which is more than the specific value (0.05).

Therefore, we reject the alternative hypothesis and accept the null:
There is no statistically significant effect at the significance level (0.05 ≥ α) of Expert Systems on Decision-Making in Saudi governmental hospitals in Najran region.
H02: There is a statistically significant effect at the significance level (0.05 ≥ α) of Neural Networks on Decision-Making in Saudi governmental hospitals in Najran region.
The table (8) indicates that Neural Networks have a statistically significant effect on Decision-Making in Saudi governmental hospitals in Najran region. The calculated value of (T) was (3.363), which is more than its tabular value (1.984) at significance level (0.001), which is lower than the specific value (0.05).
Therefore, we reject the null hypothesis and accept the alternative:
There is statistically significant effect at the significance level (0.05 ≥ α) of Neural Networkson Decision-Making in Saudi governmental hospitals in Najran region.

H03: There is a statistically significant effect at the significance level (0.05 ≥ α) of Genetic Algorithms on Decision-Making in Saudi governmental hospitals in Najran region.
The table (8) indicates that Genetic Algorithms have a statistically significant effect on Decision-Making in Saudi governmental hospitals in Najran region. The calculated value of (T) was (7.212), which is more than its tabular value (1.984) at significance level (0.00), which is lower than the specific value (0.05).
Therefore, we reject the null hypothesis and accept the alternative:
There is statistically significant effect at the significance level (0.05 ≥ α) of Genetic Algorithms on Decision-Making in Saudi governmental hospitals in Najran region.

H04: There is a statistically significant effect at the significance level (0.05 ≥ α) of Smart Agents on Decision-Making in Saudi governmental hospitals in Najran region.

The table (8) indicates that Smart Agents have a statistically significant effect on Decision-Making at Saudi governmental hospitals in Najran region. The calculated value of (T) was (9.765), which is more than its tabular value (1.984) at significance level (0.00), which is lower than the specific value (0.05).

Therefore, we reject the null hypothesis and accept the alternative:

There is statistically significant effect at the significance level (0.05 ≥ α) of Smart Agents on Decision-Making in Saudi governmental hospitals in Najran region.

Conclusion:

The study concluded that there is a high degree of appreciation for Artificial intelligence at Saudi governmental hospitals in Najran region, due to the efficiency of its dimensions.

The study found that the Smart Agents was in the first rank, in the second rank came the Expert Systems, and in the third rank was Genetic Algorithms, where these dimensions were at a high level of appreciation. Moreover, in the fourth and last rank was the Neural Networks, at moderate level of appreciation. These results indicate a high degree of Artificial intelligence at Saudi governmental hospitals in Najran region.

In addition, the study concluded that Decision-Making at Saudi governmental hospitals in Najran region was at a high level of appreciation, where it was found that the administration at Saudi governmental hospitals in Najran collects sufficient information about the problem for decision.

On another hand, the study found that the administration at Saudi governmental hospitals in Najran region does not determine the problems in order to make a decision.

Moreover, through testing the study hypotheses, the study concluded the following results:

There is a statistically significant effect at the significance level (0.05 ≥ α) of Artificial Intelligence (Expert Systems, Neural Networks, Genetic Algorithms, Smart Agents) on Decision- Making in Saudi governmental hospitals in Najran region.

From this result, the study showed the following:

a) There is no statistically significant effect at the significance level (0.05 ≥ α) of Expert Systems, on Decision-Making in Saudi governmental hospitals in Najran region.

b) There is a statistically significant effect at the significance level (0.05 ≥ α) of Neural Networks on Decision-Making in Saudi governmental hospitals in Najran region.

c) There is a statistically significant effect at the significance level (0.05 ≥ α) of Genetic Algorithms on Decision-Making in Saudi governmental hospitals in Najran region.

d) There is a statistically significant effect at the significance level (0.05 ≥ α) of Smart Agents on Decision-Making in Saudi governmental hospitals in Najran region.

Recommendation:

The study recommends enhancing the use of artificial intelligence in the decision-making process at Saudi hospitals, with a focus on the following points:

•Expert systems should be based on advanced information systems that develop solutions to various problems in Najran region Hospitals.

•Artificial neural networks in Najran region Hospitals should have the ability to derive information from complex and imprecise data.

•Artificial neural network systems in Najran region Hospitals should have the advantage of learning as in human cases.

•Najran region Hospitals should take advantage of genetic algorithms to make choices in complex issues.

•The genetic algorithms themselves should develop and adapt to the Najran region Hospitals environment to keep pace with regulatory developments.

•The intelligent agent should help the management of Najran region Hospitals to make decisions based on their stored knowledge base.

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