Artificial Intelligence as the Driver for Organizational Excellence and Ambidexterity among Nurses

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Abstract

Background: Surviving in today's challenging economy drives organizations to be continuously innovate and have its own competitive advantages and the increasing effect of globalization and technology, organizations have started to use artificial intelligence in various functions and departments to build the organizational excellence which is a key requirement for flourishing, mounting, and advance in a context that is changing speedily, and imperative for organizations to be ambidextrous through displaying both innovation and implementation to survive. **The study aimed** to explore the possibility of artificial intelligence as a driver for organizational excellence and ambidexterity as reported by the studied nursing staff. **Design:** An exploratory descriptive design was utilized. **Setting:** The study was conducted at Badr Hospital, which is affiliated to Helwan University in all departments. **Subjects:** A simple random sample of total number (n=160) out off (n=250) nursing staff, who had at least a one-year of experience in the study setting, and decided to participate in the study at the time of data collection. **Tools of data collection: Three tools** were used for data collection: Artificial Intelligence Questionnaire, Organizational Excellence Questionnaire and Organizational Ambidexterity Instrument. **Results:** revealed that, the nursing staff reported a high level of artificial intelligence (89%), moderate levels of organizational excellence and organizational ambidexterity (65.9 % & 48.8% respectively), and there was a highly positive statistically significant correlation between total artificial intelligence and total levels of organizational excellence and ambidexterity. **Conclusion:** The study concluded that, artificial intelligence was a highly significant driver for organizational excellence and organizational ambidexterity as reported by the studied nursing staff. **Recommendations:** The study recommended that, the hospital administration should enhance the culture of adoption and support of advanced technology, specifically artificial intelligence applications and machine learning tools, by using electronic work and clarifying the advantages and benefits of applying it, for employees and organizations alike. Piercing training on the standards of excellence management through seminars, workshops and forums for nursing staff and focus on identifying their strengths and weakness in the performance and taking actions. In addition to, healthcare organizations should completely revolutionize to drive ambidexterity through organization to mirror on patient outcomes, quality of nursing care and delivered health service.

Keywords: Artificial Intelligence, Organizational Ambidexterity and Organizational Excellence.

Introduction:

Recently, artificial intelligence (AI), has been used in nursing information systems by monitoring patient information, helping to save patient data, reporting forms, managing quality and reducing hospitalization time, enhancing the effectiveness of care and implementing interventions in a timely manner, cost-effectiveness and time-saving, and assisting in documentation of patient information. However, there are many obstacles facing the application of AI systems for nursing, such as high system costs and continuous change. AI is a branch of computer science which performs tasks with the help of smart machines and various applications, with or without human cognitive functions or supervisions, such as interpreting speech, playing games and identifying patterns. Also, AI is the ability of computer algorithms to approximate conclusions based solely on input data. While AI in healthcare is a term used to describe the use of machine-learning algorithms and software to copy human cognition in the analysis, presentation, and understanding of complex medical and health care data, or to exceed human capabilities by providing new ways to diagnose, treat, or prevent disease **(Maheshwari, 2023;**

Mullainathan & Obermeyer , 2022 and Mehdipour, 2019).

AI technologies may be able to improve the nursing care of various health conditions, provide complete information to support decision-making, manage medical records, minimize medical errors, optimize nursing care processes, make healthcare more accessible, provide better patient experience, improve nursing care outcomes, and reduce per capita healthcare costs. However, one of the potential implications of replacing aspects of human expertise with autonomous AI system technology is the legal implications of clinical accountability **(Choudhury & Asan, 2022).**

The exploration of willingness to accept AI-assisted learning environments was measured by using Unified Theory of Acceptance and Use of Technology (UTAUT) model. While the four core constructs of UTAUT model were (performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC)). Also, it has been often used to assess the acceptance of information and communication technologies. Such as predict tablet adoption analyze e-learning course and analyze acceptance of mobile learning **(Ming Guan, 2023).**

From another side, the organizational excellence is the capacity to harmonize and coordinate the organization's components and to manage them at the maximum rates of integration and interdependence to produce levels of outputs that satisfy the demands and expectations of all parties involved in the organization. Also, Organizational excellence contributes to the quality in all services, increases the effectiveness of organizational processes at all levels, adopts new technologies, achieves quick change, and unrestricted competition while retaining the organization's position and state (work, organizational culture, organizational structure), and allocates resources to improving university services in accordance with international standards (**Mohammed & Al-Zeidi, 2022, Al-Subaie, 2022).**

Organizational excellence achieved through the following five dimensions; organizational leadership excellence, organizational strategic excellence, organizational partnerships and resources excellence, organizational knowledge excellence, and organizational service excellence **[Aldarmaki& Yaakub, 2022 and El-Guindy, Ahmed & Ebrahim, 2022].** Organizational leadership excellence dimension describes academic leaders who create and promote educational organization's mission and vision, inspiring and motivating academic teaching staff to stay dedicated to achieving the vision **[Ghreeb, Abdelkader &Sayyd, 2021].**

The way operational excellence professional's work has the potential to dramatically change by using artificial intelligence (AI). In addition to it helps operational excellence leaders more effectively analyze, visualize, automate and optimize complex processes, AI will also equip operational leaders with powerful advanced analytics so that they can make better, data-driven decisions. The emergence of AI presents operational excellence practitioners with an incredible opportunity to not only wield these powerful technologies, but innovate with them in unprecedented ways **(Mixson, 2023),**

Finally, the Ambidexterity has been shown to be an important factor for enhancing overall firm performance, it can be defined as the capability to concurrently pursue both exploration and exploitation, and make changes resulting from the adoption of multiple, contradictory processes within the same firm. The challenge of ambidexterity lies in harmonizing the organization's strategy with its resources and capabilities such as human resource management practices managerial mechanisms and HRM architecture, team exploratory and exploitative learning intellectual capital architectures, organizational culture and leadership **(Mohammad et al. , 2019).**

So, highly ambidextrous firms manage to create products or services in an efficient way, but at the same time also constantly work on innovating or creating new products or services. In fact, the low levels of ambidexterity are predominantly due to higher levels of exploitation and low levels of

exploration, but not vice versa. In exploitation-oriented firms, employees may be seen more as a transactional resource and not as a source of ambidexterity. Such employees may be used to corporate entrepreneurship and new technology being implemented to improve cost efficiency further by reducing the number of employees. In such low-ambidexterity firms, it can therefore be expected that new efficiency leaps promised by automation will not surprise employees. Thus, it will not have a big impact on employee relational stability as the firms have always sought efficiency gains and thus an exploitation orientation. So the higher levels of organizational ambidexterity are exacerbating the detrimental effect of automation on employee relational

sability, (**Hiebl M & Pielsticker, 2023**)

Significance of the study:

Recently the health care organizations are concerning about their survival and sustainability, also, they are shouldering their responsibilities towards achieving organizational excellence and ambidexterity as a challenge of the new era to improve their performance, which representing a response to adapt to and cope with the fast and rapid changes in the fields of science and technology, especially in the competitive and uncertain global environment.   So, new ways or tactics are required to do their jobs effectively and efficiently for achieving the organizational goals and objectives, such as using artificial intelligence as a driver organizational excellence and ambidexterity in health care organizations (**Channa et al., 2021** and **Kueper, 2022**).

The importance of this study comes from dealing with conversant variables such as AI, organizational excellence and ambidexterity which are focusing attention on the recent management literature and approaches. Also, there are few studies have empirically investigated drivers of organizational excellence and ambidexterity at health care organizations. In addition, little truly evidence exists out about the role of AI in accessing and forecasting organizational excellence and ambidexterity. Therefore, to bridge the existing gap in the literature, the present study was carried out to explore the possibility of considering artificial

intelligence as a driver of organizational excellence and ambidexterity.

Aim of the Study:

Aim of this study was to explore the possibility of artificial intelligence as a driver for organizational excellence and ambidexterity as reported by the studied nursing staff.

Research Questions

The research study guided by the following formulated questions:

1. What is the level of artificial intelligence at Badr University Hospital from the studied nursing staff's viewpoint?

2. What is the level of organizational excellence as reported by the studied nursing staff?

3. What is the level of ambidexterity as reported by the studied nursing staff?

4. Is artificial intelligence a significant driver for organizational excellence and ambidexterity?

Subject and method:
Technical design.
Research design:

An exploratory descriptive design was used to achieve the aim of this study.

Setting:

The study was conducted at Badr University hospital which is affiliated to Helwan University in all departments equipped with total capacity of beds (**200 beds**). It included two floors; the first floor consisting of optical binocular unit for the upper and lower gastrointestinal tract and respiratory binocular Emergency department; there was room (1) for triage patients (2 beds), room (2) for males observation (3 beds), room (3) for females observation (3 beds), room for surgery (3 beds), room for resuscitation (2 beds) beside the emergency radiology department; there are (2) rooms for X-Ray and CT scan, blood bank, also outpatient clinics there are (14) outpatient clinics, dentinal in addition to operational department for emergency consists of (3) rooms, the nursing office and the kitchen. The second floor consists of operational department; included (4) rooms for all types of surgery, (4

beds) for recovery, sterilization department, inpatient department (20 beds), intensive care unit (6 beds), (1 bed) for isolation, cardiac care unit (3 beds), catheterization department (3 beds), human resources management department, the director office and (4) classrooms for training medicine students and to occur the scientific events. It provides free and economic services to all patients with a wide range of ambulatory care services such as outpatient clinics, Pharmacy, Emergency, X-ray, Physiotherapy, and Paramedical Services as Dietary, Laundry, and Maintenance.

Subjects:
Subjects size:

All available nursing staff subjects (n=160) out off (n=300) who were working at the previously mentioned setting during the study, the subjects selected by using a simple random sample of nursing staff "who were working at the study setting, had at least one year of experience and decided to participate in the study at the time of data collection".

The sample size was calculated using the "Epi info program version 7", it was based on a variance of 5%, confidence level of 95%, and power of 0.80. The final number of study subjects (160 Nursing Staff), composed of (100 Nursing Staff) working at Critical Care Units and (60 Nursing Staff) working at Un-Critical Care Units in the study setting.

Study variables:
- Independent variable: Artificial intelligence.
- Dependent variable: Organizational excellence and ambidexterity.

Tools of Data Collection:
There are three tools for data collection as following:
1st Tool: Artificial Intelligence Assessment by using Unified Theory of Acceptance and Use of Technology (UTAUT) Questionnaire.
2nd Tool: Organizational Excellence Questionnaire.
3rd Tool: Ambidexterity Instrument.

First Tool: Artificial Intelligence Assessment by using Unified Theory of Acceptance and Use of Technology (UTAUT) Questionnaire, it consists of two part:

Part 1. Personal Characteristics: Included: (age, gender, marital states, level of education, years of experience, working units, wages, years of using technology, had knowledge about artificial intelligence and attending training courses in artificial intelligence).

part 2. Artificial Intelligence Assessment by using Unified Theory of Acceptance and Use of Technology (UTAUT) Questionnaire. It adapted from **(Venkatesh et al., 2003)** to assess perception of the nursing staff regarding artificial intelligence, it consists of (24) item which covered (7) dimensions (performance expectancy, effort expectancy, social influence, facilitating conditions, behavioral intention, behavioral expectations, and voluntary use).

Scoring system:
Responses of the participants were measured by using a 7-points Likert scale ranges from very strongly agree (7) to very strongly disagree (1). This tool consisted (24 items) and the total grade was (120). Range of scores from 24-168 and cutoff point was done at 60 % = 100 points. According to **Mohamed et al. (2023)** subject responses were calculated in the scoring system and classified into: **Low level:** if the total score was less than 60%, it means less than 100 points. **Moderate level:** if the total score was equal or more 60 to less than 75%, it means less than $\geq 100< 126$ points. And **High level:** if the total score was equal to or more 75%, it means equal or more than 126 points.

Second Tool: Organizational Excellence Questionnaire. It developed by **(Abu Naser & Al Shobaki, 2017),** to assess organizational excellence as perceived by the nursing personnel. It included (15 items) grouped under three dimensions (organizational leadership excellence, organizational knowledge excellence and organizational service excellence).

Scoring system:
Responses of the participants were measured by using a five- points Likert scale ranges as; (5) Strongly Agree, to (1) Strongly Disagree. Finally, the scores of each dimension summed up and converted to percent scores. Range of scores from 15-75 and cutoff point was done at 60 % = 45 points. Accordingly, levels of organizational excellence as perceived

by the nursing personnel were categorized as the following: **Low perceived level:** if the percent <60% that equals less than 45 points. **Moderate perceived level:** if the percent from 60 % to > 75% that equals from 45 to less than 56 points. And **High perceived level:** if the percent >75% that equals to equal or more than 56 points.

Third Tool: Ambidexterity Instrument. It was used to examine the perceived level of nurses' ambidexterity, **it** was adopted from **Mom et al. (2007) and J. A. Zhang et al. (2020)**, to reflect the exploration and exploitation concepts defined by **March (1991).** It consisted of (11 items) which reflects the nursing staff ambidexterity through two dimensions, both employee (exploration activities and exploitation activities). A sample item for nursing staff exploration activities such as "I am capable of engaging in searching for new possibilities concerning products/services, processes, or markets" and "In the past year I was engaged in activities that focused on strong renewal of services, activities or processes". A sample item for nursing staff exploitation activities such as "I am capable of engaging in activities of which a lot of experience has been accumulated by myself" and "In the past year I was engaged in activities that primarily focused on achieving short-term goals".

Scoring system:

Responses of the participants were measured by using a five- points Likert scale ranges from; (5= to a very large extent), to (1= to a very small extent). Finally, the scores of each dimension summed up and converted to percent scores. Range of scores from 11-55 and cutoff point was done at 60 % = 33 points. Accordingly, levels of organizational excellence as perceived by the nursing personnel were categorized as the following:

Low perceived level: if the percent <60% that equals less than 33 points. **Moderate perceived level:** if the percent from 60 % to > 75% that equals from 33 to less than 41 points. And **High perceived level:** if the percent equal or >75% that equals to equal or more than 41 points.

Data Collection Procedure
Administrative design

After explanation of the nature of the study, aim and objectives, an official permission was issued from the Dean of the Faculty of Nursing, Helwan University, then this approval was presented to the Director of Badr University Hospital to allow the investigator collecting the data for conduction of this study.

Operational design

The operational design covers the planning phase, the pilot study, and the fieldwork. This stage took six months from the beginning of April, to the end of September, 2023.

Preparatory phase:

It included reviewing of past, current, recent national and international related literature and theoretical knowledge of various aspects relating to the research themes of the study using textbooks, articles, internet, periodicals and journals to develop tools for data collection. The tools were prepared by the investigator for gathering the data and translated it into Arabic to ensure its accurateness and tested for content validity and dependability. This phase took about three months from April 2023 to July 2023.

Validity of the tools:

The three tools were formulated, translated into Arabic and submitted to five experts from Nursing Administration specialty of different Faculties; two Professors from Ain Shams University, two Professors from Helwan University, and one Assistant Professors from Benha University were revised the tools to judge its clarity, comprehensiveness, relevance simplicity and accuracy. All of their suggestions were taken into account and some items were rephrased at the final version of the tools. The tools were regarded as valid from the experts' point of view. This stage took two months from the beginning of April, 2023 to the end of May, 2023.

Reliability of the tools:

The reliability of tools was applied to measure the internal consistency and homogeneity of the instruments using Cronbach's Alpha test. The values of reliability for the three tools were: The **Artificial Intelligence Questionnaire** was (0.88), the **Organizational Excellence Questionnaire** was (0.94) and the **Ambidexterity Instrument** was (0.954). This indicating that the tools were internally consistent and highly reliable.

Pilot study:

A pilot study was carried out on 16 nursing staff (10%) of the sample to examine the validity of the item sequence, the applicability and practicability of the study tools, the clarity of statement' language, and the estimated time required to complete each study tool. Based on the results, slight modifications in statement' language was done so this sample was included in the final study sample size. The pilot study was carried out in June, 2023.

Fieldwork:

After securing the official approvals for conducting the study from the hospital manager, the investigator prepared the questionnaire electronically via Google form design and sent to nursing staff through the WhatsApp groups via head nurses of various departments included in the study, for explaining the aim, nature and the implications of the study and the process of filling the electronic questionnaires to the nursing staff in their departments. Data was collected daily through one month in August, 2023 and the average numbers of responses per day was ranged from 5-6 responses from the nursing staff.

Ethical considerations:

The research approval was obtained from the Scientific Research Ethical Committee of Faculty of Nursing- Helwan University, before starting the study to gets an official permission to conduct the study. Also, each nursing staff participant was informed about the nature, purpose and the expected outcomes of study in order to get their cooperation, approval and oral informed consent to participate in the study. The assurance that, all collected data will be utilized strictly for research only, was given to the participants as a whole, and they were assured that, the study is harmless and their participation is voluntary also they have the right to withdraw from the study at any time without providing a justification. Confidentiality and anonymity of the data and results were also guaranteed. Additionally, the investigator employed bracketing and intuitive techniques to eliminate bias. Ethics, values, culture, believes and consideration for participants' rights and ethical requirements for research were respected through the whole study conduction phases.

Statistical Design:

Upon completion of data collection, data computed, organized, tabulated and statistically analyzed using Statistical Package for the Social Science (SPSS, version 26). Descriptive statistics tests as frequency and percentages for qualitative (Categorical) variables as (Demographic Characteristics), while mean and standard deviation (mean ±SD) for quantitative (Continuous) variables, were used as central tendency and dispersion measures, respectively to express the results. As well as, Pearson correlation coefficients (r) analysis was performed to examine the nature of the link between the research variables, while appropriate inferential statistics such as one-way analysis of variance (ANOVA) (F) test was employed to compare the mean scores in normally distributed quantitative variables at more than two groups and spearman rank were used to estimate the closeness correlation between two quantitative variables. R linear regression and Tukey test. are the most basic and commonly used predictive analysis, were used to assess the analytical statistics and describe data to explain the relationship between dependent and independent variables. The statistical significance for all tests, a two-tailed p-value $\leq$ 0.05 was considered statistically significant, p-value $\leq$ 0.01 was considered highly statistically significant. While p-value> 0.05 was considered not significant. Additionally, it provided a scientific calculation for identifying and predicting future outcomes.

Limitations to this study:

There were some limitations to the existing study such as, data were collected from the study participants through the prepared electronic Google form questionnaire, this required concentrated training to use google form and answer the questionnaire which achieved by using video to explain the process of using google form and sent by the researchers through the WhatsApp groups via head nurses of different departments who explained the aim and the nature of the study and the method of filling the electronic questionnaires to the study participants.

Results:

Table (1): Plays frequency distribution of personal and job characteristics among the studied nursing staff, which represents that about half (45%) of the age of the studied nursing staff was ranged from 25 to less than 35 years old, with a mean age of (27.83±5.14). Additionally, more than half (55%) of them were males with a male to female ratio is 1.1:1 and were married respectively. Considering, level of education, more than three quarters (80%) of them were holding a certificate of Associate Degree of nursing. Also, in relation to years of experience and nurse's wages, two fifths and more than one third (40% & 37.5%) of them had from 5 to less than ten years of experience and less than two thirds (62.5%) of them working on Critical Care Unit and the lowest percentage (37,5%) of them working on Un- Critical Care Unit respectively. Finally, most of them were nursing staff (88.75%) and their salary ranged from 4000 to less than 5000 Egyptian Pounds with (total Mean ± SD= 7.31±3.90 & 4900 ± 1180) respectively.

Figure 1: Mirrors that, the majority (89 %) of the studied nursing staff perceived the level of Artificial Intelligence as high in their organization, while the lowest percent (7.9 % & 3.1 %) of them perceived its level as moderate and low respectively, in their organization.

Figure 2: Reveals that, about two thirds (65.9%) of the studied nursing staff perceived the level of Organizational Excellence as moderate. While, more than one quarter (26.4%) of them perceived its level as low and the lowest percent (7.7%) of them perceived its level as high in their organization.

Figure 3: Indicates that, about half (48.8%) of the studied nursing staff perceived the level of Organizational Ambidexterity as moderate, while, nearly two fifth (39.0%) of them perceived its level as low and the lowest percent (12.2%) of them perceived its level as high in their organization.

Table 2: Shows that the total mean score and standard deviation of Artificial Intelligence among nursing staff was 66.58±8.29, and the highest mean score of Artificial Intelligence domain was 17.40±2.81 related to Performance expectancy domain. In contrast, the lowest mean score was 10.01±2.61 related to Facilitating conditions domain. Concerning organizational Excellence, the total mean score was 39.75±4.76, and the highest mean score was related to organizational leadership excellence domain 15.01±2.61. Otherwise, the lowest mean score was 12.52±2.12 related to organizational service excellence domain. Regarding organizational Ambidexterity, the total mean score was 26.98±5.36, and the highest mean score was 7.61±2.17 related to Exploitation activities domain, while the lowest mean score was 6.48±2.14 related to Exploration activities domain.

Table 3: Illustrates that there was a highly positive statistically significant correlation between total Artificial Intelligence level, Organizational Excellence, and Ambidexterity levels as reported by the studied nursing staff at (p-value <.01).
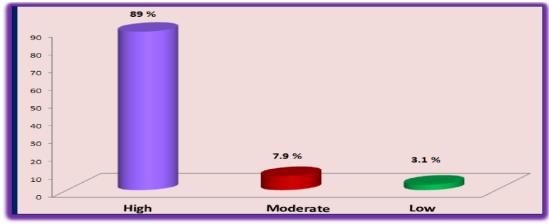
Table 4, 5, and 6: From the linear regression analysis results, we can predict Organizational Excellence from the total score of Artificial Intelligence.
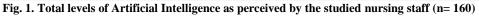
The following equation can be formulated: Organizational Excellence = (44.918+0.545). It is evident that Artificial Intelligence was a highly significant predictor of Organizational Excellence at (p-value <0.01), F (39.563), R2 value was (0.098), the adjusted R2 value of (.096).
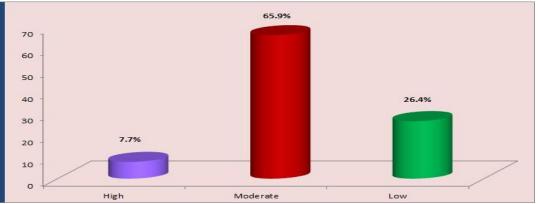
Table 7, 8, and 9: From the linear regression analysis results, we can predict the Organizational Ambidexterity from the total score of Artificial Intelligence.
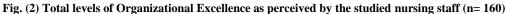
The following equation can be formulated; Organizational Ambidexterity = (16.478+0.264). It is evident that Artificial Intelligence was a highly significant predictor of Organizational Ambidexterity at (p-value <0.01), F (21.200), R2 value was (0.055), the adjusted R2 value of (0.052).

Table (1). Frequency distribution of personal and Job characteristics among the studied nursing staff (n= 160)

Items		No	%
Age (year)	▪ 20 < 25 Years.	50	31.25
	▪ 25 < 35 Years.	72	**45.0**
	▪ 35 < 45 Years.	22	13.75
	▪ ≥ 45 Years.	16	10.0
	▪ Mean ± SD	**27.83**	**± 5.14**
Gender	▪ Male	72	**55.0**
	▪ Female	88	45.0
	▪ Male to Female Ratio	**1.1**	**:1**
Marital Status	▪ Unmarried	16	10.0
	▪ Married	144	**90.0**
Level of Education	▪ Nursing Diploma	8	5,0
	▪ Associate Degree of Nursing	128	**80.0**
	▪ B.Sc. Nursing	22	13.75
	▪ Master degree	2	1.25
Years of Experience	▪ 1 < 5 Years.	56	35.0
	▪ 5 < 10 Years.	64	**40.0**
	▪ 10 < 15 Years.	24	15.0
	▪ ≥ 15 Years.	16	10.0
	▪ Mean ± SD	**7.31 ± 3.90**	
Working Units	▪ Critical Care Units	100	**62.5**
	▪ Un-Critical Care Units	60	37.5
Job position	▪ Supervisor nurse	5	3.125
	▪ Head nurse	13	8,125
	▪ Staff nurse	142	**88.75**
Salary	▪ 3000 < 4000 L.E.	54	33.75
	▪ 4000 < 5000 L.E.	60	**37.5**
	▪ 5000 < 6000 L.E.	22	13.75
	▪ ≥ 6000 L.E.	24	15.0
	▪ Mean ± SD	**4900 ± 1180**	

Fig. 1. Total levels of Artificial Intelligence as perceived by the studied nursing staff (n= 160)

Fig. (2) Total levels of Organizational Excellence as perceived by the studied nursing staff (n= 160)
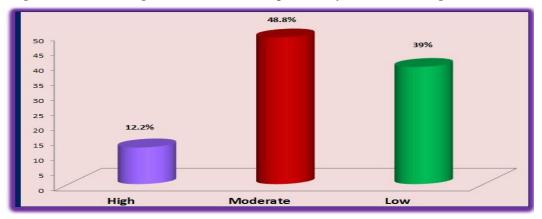

Fig. (3) Total levels of Organizational Ambidexterity as perceived by the studied nursing staff (n= 160)

Table 2. Mean and standard deviation of Artificial Intelligence, Organizational Excellence and Organizational Ambidexterity as reported by the studied nursing staff (n=160)

Variables	Maximum Score	Mean±SD	Mean%
- Performance expectancy	28	17.40±2.81	52.7
- Effort expectancy	28	14.20±2.37	59.2
- Social influence	21	13.75±3.46	65.5
- Facilitating conditions	28	10.01±2.61	72.4
-Behavioral intention	21	12.01±2.61	63.0
-Behavioral expectations	21	11.01±2.61	69.0
-Voluntary use	21	12.89±3.15	63.0
Total Artificial Intelligence level	**168**		**66.58±8.29**
- Organizational leadership excellence	25	15.01±2.61	60.0
- Organizational knowledge excellence	25	13.75±3.46	63.6
- Organizational service excellence	25	12.52±2.12	83.5
Total organizational Excellence level	**75**		**39.75±4.76**
- Exploration activities	25	6.48±2.14	72.0
- Exploitation activities	30	7.61±2.17	50.7
Total Organizational Ambidexterity level	**55**		**26.98±5.36**

SD: Standard Deviation

Table 3. Correlation between Artificial Intelligence level, Organizational Excellence, and Ambidexterity levels as reported by the studied nursing staff

Variables		Total Organizational Excellence	Total Organizational Ambidexterity
Total Artificial Intelligence	r	.313	.235
	P	.000**	.000**

**highly significant at P<0.01   r: Pearson coefficient

Table 4. Standardized and unstandardized simple regression coefficients of Artificial Intelligence predicting Organizational Excellence level (n=160)

Variables	Unstandardized Coefficients		Standardized Coefficients	t	P-value
	B	Std. Error	B		
(Constant)	44.918	3.469		12.949	.000
Total Artificial Intelligence	.545	.087	.313	6.290	.000

**highly significant at P<0.01   T: t-test value
a.   Dependent Variable: **Organizational Excellence**
b.   Predictors: (constant) **Artificial Intelligence**

Table 5. Model summary of R square and adjusted R square test

Model	R	R Square (R2)	Adjusted R Square	Std. The error of the Estimate
1	.313a	.098	.096	7.88566
a. Predictors: (Constant): Total Artificial Intelligence level				
b. Dependent Variable: Total Organizational Excellence level				

Table (6): Regression and ANOVA test

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2460.183	1	2460.183	39.563	.000b
	Residual	22634.858	364	62.184		
	Total	25095.041	365			
a. Predictors: (Constant): Total Artificial Intelligence level						
b. Dependent Variable: Total Organizational Excellence level						

F: ANOVA   **highly significant at P<0.01   DF: degree of freedom

Table 7. Standardized and unstandardized simple regression coefficients of Artificial Intelligence predicting Organizational Ambidexterity level (n=160)

Variables	Unstandardized Coefficients		Standardized Coefficients	t	P-value
	B	Std. Error	B		
(Constant)	16.478	2.298		7.171	.000
Total Artificial Intelligence	.264	.057	.235	4.604	.000

**highly significant at P<0.01   T: t-test value
a. Dependent Variable: **Organizational Ambidexterity**
b. Predictor: (constant): **Artificial Intelligence**

Table 8. Model summary of R square and adjusted R square test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	578.527	1	578.527	21.200	.000 b
	Residual	9933.375	364	27.289		
	Total	10511.902	365			
a. Predictor: (Constant): Total Artificial Intelligence level						
b. Dependent Variable: Total Organizational Ambidexterity level						

Table 9. Regression and ANOVA test

Model	R	R Square(R2)	Adjusted R Square	Std. The error of the Estimate
1	.235a	.055	.052	5.22393
a. Predictors: (Constant): Total Artificial Intelligence level				
b. Dependent Variable: Total Organizational Ambidexterity level				

F: ANOVA   **highly significant at P<0.01   df: degree of freedom

Discussion

Presently the health care organizations are concerning about their survival and sustainability, also, they are shouldering their responsibilities towards achieving organizational excellence and ambidexterity as a challenge of the new era to improve their performance, which representing a response to adapt to and cope with the fast and rapid changes in the fields of science and technology, especially in the competitive and uncertain global environment. So, new ways or tactics are required to do their jobs effectively and efficiently for achieving the organizational goals and objectives, such as using artificial intelligence as a driver organizational excellence and ambidexterity in health care organizations (**Channa et al., 2021** and **Kueper, 2022**).

The existing study aimed to explore the possibility of considering artificial intelligence as a driver for organizational excellence and ambidexterity as reported by the studied nursing staff. To achieve the aim of the study and answer the research questions, the research findings will be illustrated as:

Discussion of the present study was presented in the following sequences: Part (I): Personal data of the nursing staff; Part II. Artificial intelligence as perceived by nursing staff; Part III. The organizational excellence and ambidexterity levels as perceived by studied nursing staff; and Part IV. Is artificial intelligence a significant driver of organizational excellence and ambidexterity as reported studied nursing staff?

Part (I): Personal data of the nursing staff

The finding of the present study demonstrated that, about half of the age of the studied nursing staff was ranged from 25 to less than 35 years old. Additionally, more than half of them were males and married r. As regards, level of education, more than three quarters of them were holding a certificate of Associate Degree of nursing. Also, two fifths of them had from 5 to less than ten years of experience and less than two thirds of them working on Critical Care Unit. Finally, most of them were nursing staff and their salary ranged from 4000 to less than 5000 Egyptian Pounds.

Part II. Artificial intelligence as perceived by nursing staff

Artificial intelligence, being a part of information technology, influences the performance of the organization, and the organizational capabilities affect the

organizational performance in a similar way that the organizational capabilities influence the relationship between artificial intelligence and organizational performance (**Rehman, et al., 2019**). Artificial intelligence and virtual reality are the branches of computer studies and are significant tools for improving human life or sustaining their lifetime learning procedures. Technology plays a vital role in influencing the social, political, cultural, educational, and organizational sectors (**Siryani et al., 2017**).

Regarding artificial intelligence level, the findings of the study result revealed that artificial intelligence level as perceived by the majority of the studied nursing staff, was high in their organization. This result might be related to the majority of the studied nursing staff had training courses in artificial intelligence, also, there were scientific collaborations between the University Hospital, Faculty of Medicine, and Faculty of Nursing, which involve the hospital in their training and educational activities such as annual scientific conferences, workshops, and seminars which facilitate various aspects of managing knowledge of artificial intelligence and delivering health care services.

The existing study results were in consistent with the study by **Mohamed et al., (2023)** who conducted the study in Egypt, entitled of "Artificial Intelligence Technology and its Relation to Staff Nurses' Professional Identity and Problem-Solving Abilities", also, who showed that, about two-thirds of staff nurses had high perception level toward artificial intelligence technology. Additionally, these results are in line with the past study of **Garg (2020); He et al. (2019),** this study explored the benefits of applying artificial intelligence in the operation, production, and marketing of business organizations and using artificial intelligence as an organizational resource was combined in such a way to give maximum output with minimum inputs. Moreover, the existing study findings were in agreement with **Lambert et al., (2023)** who conducted the study in Germany, entitled "An integrative review on the acceptance of artificial intelligence among healthcare professionals in hospitals", and who demonstrated that, more than two third of healthcare professionals in

hospitals had a high acceptance level of artificial intelligence.

On the other hand, the present study findings were in the opposites line with the study by **Castagno & Khalifa, (2020)** who conducted the study in UK, who studied "Perceptions of Artificial Intelligence Among Healthcare Staff: A Qualitative Survey Study", also, who reported that, the majority of respondents had never encountered AI applications in the workplace and were unaware of the differences between machine learning and deep learning. They confirmed that AI to be successfully incorporated into clinical practice, the support of healthcare professionals is essential. Finally, the present study results were in converses with **Su & Chao, (2022)** who conducted the study in Taiwan, entitled "Investigating Factors Influencing Nurses' Behavioral Intention to Use Mobile Learning: Using a Modified Unified Theory of Acceptance and Use of Technology Model", and who demonstrated that, the majority of nurses had a negative perception about performance expectancy and behavioral intention with a highly statistically significant difference.

This part of the discussion answered the 1st research question; what is the level of artificial intelligence as perceived by the studied nursing staff?

III. The organizational excellence and ambidexterity levels as perceived by studied nursing staff

The increasing effect of globalization and technology, organizations have started to use information systems in various functions and departments in the last decades. Foundation of building the organizational excellence is a key requirement for thriving, growing, and achieving a competitive advantage in a context that is changing quickly. Organizational excellence boosts employees' productivity and efficiency also advancing the organization's performance overall done through the hiring, selection, training, compensation, development, and efficient staff evaluation processes (**Agaibi & Gerges, 2022 and Salih, 2020**).

Regarding organizational Excellence level, the results of the existing study presented

that, the level of organizational Excellence as perceived by about two thirds of the studied nursing staff, was moderate in their organization. The outcome was congruent with **(El-Guindy, Ahmed & Ebrahim, 2022),** who explained that, nursing management staff had low perception levels of organizational excellence. Likewise, **Domour (2017),** who discovered that, the degree of practicing organizational excellence among the leaders' staff in the Jordanian universities was low. Similarly, this result was in discrepancy with **(Daradkeh, 2017),** who specified that, the degree of practicing organizational excellence from the perspectives of the staff members was medium.

On the contrary, this consequence was contrasted with **(Abu Jarbou, 2022),** who discovered that, there is a very high level of organizational excellence at the University of Gaza. And, in the same **(Alhalaseh, & Ayoub, 2021),** who quantified that, the level of organizational excellence had gotten a high level in Jordanian commercial banks. Moreover, this result was similar with **(El-Eida, 2020),** who displayed that, staff has a high level of organizational excellence. Correspondingly, **(Alayachi, & Oarida, 2019),** who reported that, the level of organizational excellence in the faculty of Skikda was high.

Organizational ambidexterity is the ability of the organization to explore and exploit its internal and external resources simultaneously to meet daily business needs, as well as to adapt to future market changes **(Hughes, 2018).** Organizational ambidexterity is understood as the ability of the organization to invest in new opportunities through simultaneous exploration and exploitation. Organizations follow several important ways in the process of achieving a balance in exploring opportunities and exploit them using an integrated approach with a focus on competencies, systems, incentives, processes, and programs for the internal culture of the organization as well as strategic plans at the level of the organizational structure as a whole **(Gentimir, 2015).** The organization's ability to be ambidextrous is at the core of dynamic capabilities. Ambidexterity requires senior managers to accomplish two critical tasks: to sense opportunities and the changes in the competitive environment and to seize these opportunities by restructuring the tangible and intangible assets to meet the new challenges **(O'reilly & Tushman, 2013).**

Regarding organizational ambidexterity level, the present study results showed that, the level of organizational Ambidexterity at Badr University Hospital, about half of the studied nursing staff, was as perceived moderate level of ambidexterity in their organization. This result due to concept of ambidexterity is considered as a new trend in nursing management field. The current study result in alignment with **Martin et al. (2023),** who suggest that, the organization should balance between exploitation and exploration to invest in ambidexterity to enhance the firm's strategic opportunities in the global markets. This part of the discussion answered the 2nd research question; what are the organizational excellence and ambidexterity levels of Bader University Hospital as reported by studied nursing staff?

Regarding the relationship between artificial intelligence and organizational excellence, the current study's result follows the study conducted by **Woźniak (2023),** who reported that, Excellence is using learning to create innovation and improvement opportunities; the organization easily "jump on" the technology and artificial intelligence advanced levels to celebrate successes on the market**.**

Regarding the relationship between artificial intelligence and organizational ambidexterity, the current study's result follows the study conducted by **Yunitaa et al. (2023),** who indicated that, businesses must continuously enhance the technological capacity and AI to foster organizational ambidexterity. Also, **Andrade (2020),** who mentioned that, technological capacity has a considerable and positive effect on organizational ambidexterity. At the same side, the study was conducted by **Mahmood & Mubarik (2020),** who had proven that, using AI and technology-absorptive capacity impacts organizational ambidexterity, and reported that, absorbing technology is an essential organizational capability to welcome

the fourth industrial revolution and is related to organizational ambidexterity.

Additionally, **Farzaneh et al. (2022),** who found that, corporate competence's importance in generating innovations that exploit existing products, skills, and resources while exploring new opportunities. Finally, a previous study of **Ardito et al. (2018),** had highlighted that, globalization and technological changes have created a competitive business environment inspiring organization to frequently develop and introduce new products or services.

This discussion part answered the 3rd research question; is artificial intelligence a significant driver of organizational excellence and ambidexterity? The current study findings illustrated a highly positive statistically significant correlation between total artificial intelligence level and total levels of organizational excellence and ambidexterity. It also confirmed that artificial intelligence was a highly significant driver of organizational excellence and ambidexterity. From the researchers' viewpoint, this result may be interpreted that the using of AI and technology openness the new opportunities for organization to build and strengthen its performance to be a benchmark in delivering its services so using AI is considered as competitive advantage of the organization in the global markets this in agreement with the study findings which conducted by **Wirtz et al. (2023),** who concluded that, allowing the organization to implement new service technologies leading to achieve productivity and deliver service e excellence and enforce ambidexterity.

Conclusion

Grounded on the results, the existing study was concluded that, the majority of nursing staff reported that the artificial intelligence level was high. Also, slightly less than two-thirds of them reported that the organizational excellence level was moderate. And less than half of them reported that the organizational ambidexterity levels were moderate. Additionally, there was a highly positive statistically significant correlation between total artificial intelligence and total levels of organizational excellence and

ambidexterity. Otherwise, the artificial intelligence was a highly significant driver for organizational excellence and organizational ambidexterity as reported by the studied nursing staff.

Recommendations

The study recommended that,

The following suggestions can be made based on the previous findings of the current study as the following:

- **At the level of Hospital administration:**

1.Support and adopt the organizational culture to successfully using artificial intelligence technologies, machine learning tools and practices at the workplace to face volatile environmental changes and increased competition in today's complex world to ensure its sustainability and competitiveness.

2. Capitalize the organizational infrastructure ecosystem, infrastructure, and governance mechanisms and technologies to provide all resources that help nursing staff to do their work and for the development of organizational performance and organizational excellence.

3. Support and enforce the organizational efforts to minimize the resistance which confront the organizational culture of change to maintain organizational excellence.

4. Appreciate nursing staff who practice criteria and standards of organizational excellence through their operational activities.

5. Pay attention regarding the business competitive world to be ready to perform better in comparison with the competitors which is the only way to survive in the global markets and its organizational excellence.

6. Intense training and development process on the standards of excellence management through seminars, workshops, awareness sessions and forums for staff nurses to for identifying their strengths and weakness in the performance, that has a significant role in developing the skills of leadership, knowledge management and the optimum delivery of service, for improving organizational performance, quality of service and achieving organizational excellence and for using AI in

nursing practice to enhance their operations and improve their performance and satisfaction.

7. Build special teams and hold seminars and lectures in order to achieve speed, flexibility, reactivity, adaptability, exploration and exploitation through their workplace to mirror on patient outcomes, quality of nursing care and delivered health service.

8. Enforce understanding, harmony and cooperation in various specialties to use AI technologically development, to improve the organizational excellence and to drive the behavior of ambidexterity through the whole organization.

9. Communicate openly with the surrounding community and geographical areas to spread the culture of excellence and ambidexterity, to keep abreast of the AI applications, to meet the requirements of the labor market and contribute to solve many problems and rapid response despite the points of consensus in its strategic performance.

At the level of Further Research Directions:

10. In general, this research framework could be a guideline for future empirical research further explain the effect of AI based organizational excellence and the overall organizational ambidexterity, performance and reputation.

11. Replicate the study on a larger probability sample is highly recommended to bridge the small size of the samples and to generalize the results to include more organizations to yield different data and

Ethical Responsibilities of Authors: The authors of this article confirm that their work complies with the principles of research and publication ethics.

Practical Implications

The study has great practical significance, it will help managers understand how to adopt artificial intelligence to achieve organizational excellence and ambidexterity. Additionally, in-depth framework this paper upgrades the previous understanding of artificial intelligence, organizational excellence and ambidexterity to maintain their competitive position with a clear roadmap to align the key performance indicators. The study found that

organizational excellence and ambidexterity can be improved with the application of artificial intelligence and these organizational capabilities help improve organizational performance. This study's conclusion can be utilized as a reference for future research and requires immediate examination to meet the degree of using AI, organizational excellence and ambidexterity exploration and exploitation in the health care sector.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest

The authors declare no conflict of interest.

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