

## معوقات تطبيق الذكاء الاصطناعي في العمليات التجارية من وجهة نظر العاملين

### بصناعات الأغذية بجمهورية مصر العربية

#### The challenges of implementing artificial intelligence in commercial processes as perceived by the employees at food industries in Arab Republic of Egypt

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#### المستخلص:

يهدف هذا البحث إلى معرفة العلاقة بين العوامل الشخصية للعاملين وإدراكهم لتحديات تطبيق الذكاء الاصطناعي، ومعرفة الفروق المعنوية بين الفئات الثلاث التي تعيق تطبيق الذكاء الاصطناعي في مجال التطبيق وهم العاملون في الصناعات الغذائية في جمهورية مصر العربية. واعتمد البحث على فلسفة الوضعية والمنهج الاستنتاجي وأسلوب التحليل الكمي والنوعي كمنهجية للبحث. وكانت أداة جمع البيانات هي الاستبانة. وبناءً على ذلك، تم جمع (400) استبانة صالحة للاستخدام إلكترونياً من خلال قنوات التواصل الاجتماعي. بالإضافة إلى ذلك، تم استخدام SMART PLS 4.0 لاستكشاف العلاقات السببية بين متغيرات البحث. وتكشف النتائج عن عدم وجود علاقة إحصائية بين العوامل الشخصية للعاملين وإدراكهم لتحديات تطبيق الذكاء الاصطناعي وعدم وجود فروق معنوية بين متوسطات الفئات الثلاث التي تعوق تطبيق

1- دكتوراه إدارة الأعمال، كلية التجارة، جامعة المنصورة

2- باحث ماجستير إدارة الأعمال - جامعة المنصورة

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الذكاء الاصطناعي. بالإضافة إلى ذلك، فإن هذا البحث له أيضًا آثار عملية وإرشادية مهمة، وآثار نظرية للباحثين المهتمين بمتغيرات البحث.

الكلمات المفتاحية: الذكاء الاصطناعي، الصناعات الغذائية، جمهورية مصر العربية.

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**Abstract:**

This research aims to investigate significant correlation between the employees' Personal factors and their perception towards challenges of applying artificial intelligence and investigate significant differences between the three groups that hinder applying artificial intelligence in the field of application which is the employees at food industries in Arab republic of Egypt. The research adopted the philosophy of positivism, the deductive approach, and the method of quantitative and qualitative analysis as the research methodology. The instrument utilized for data collection was the questionnaire. Consequently, (400) usable questionnaires were collected electronically through social media channels. In addition, Using SMART PLS V4.0 to explore the causal relationships between the research variables. The findings reveal that there is no correlation relationship between the employees' Personal factors and their perception towards challenges of applying artificial intelligence and there aren't significant differences between the means of the three groups that hinder applying artificial intelligence. In addition, this research also has significant practical implications and guidelines, and theoretical implications for researchers who are interested in research variables.

**Keywords:**

1. Artificial intelligence
2. Food industries
3. Arab Republic of Egypt

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## Introduction

Artificial intelligence (AI), combined with advanced machine learning (ML) methods from computer science, is significantly impacting diverse areas such as science, technology, industry, and everyday life. The methods of (AI) are used in many basic sciences (such as information science (informatics), mathematics, medical sciences, materials sciences, earth sciences, life sciences, physics, and chemistry.) to develop scientific knowledge and enhance applications for the benefit of humanity, society, and the global community. (Xu et al., 2021)

Therefore, this research studies the significant correlation between the employees' Personal factors and their perception towards challenges of applying artificial intelligence

## Exploratory research

### 1. Pilot study & practical problem

Researchers performed a pilot study to explore the research problems and questions. Structured interviews were held with (24) employees at food industries in Arab republic of Egypt. Researchers asked (1) question, while interviewees were required to choose one of two alternatives. Interviewees were allowed to interpret their answers and tell more detailed information about their preferences.

Question was as follows:

Which option do you prefer when doing commercial processes?

- 1- I use the traditional ways ( )
- 2- I use the AI ( )

Obtained answers to these questions were as follows:

- 83 % of respondents prefer traditional ways.
- 17 % of respondents prefer using AI.

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## 2. Research Gap and literatures

A set of literature discussed using AI in commerce, such as (Mehta and ahmed, 2022) that provides a comprehensive overview of current AI applications in various business domains, highlighting the state-of-the-art technologies and identifying gaps in implementation challenges. While (Green and Roberts, 2023) reviews the evolution of AI applications in commerce and discusses emerging trends, providing insights into areas that are underexplored.

(William and lopez,2021) explores the unique challenges and opportunities for AI adoption in emerging markets, which can help identify gaps related to regional and cultural contexts.

In conclusion, the academic gap identified in the research on the challenges of using AI in commerce processes underscores the critical need for further exploration and development of guidelines to ensure the ethical use of AI in commerce.

### Research problems & questions

Based on the academic gap, the practical gap, and the researcher's observations, the problem of the current research was stated as follows:

The current research problem is to investigate the relationship between the employees' Personal factors and their perception towards challenges of applying artificial intelligence In order to address the research gap, the following two questions are asked:

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**Q1.** What is the nature of the correlation relationship between employees' Personal factors and their perception towards challenges of applying artificial intelligence?

**Q2.** What are the significant differences between the three groups that hinder applying artificial intelligence?

### **Research Objectives**

By investigating the research gap and its questions, this research embraces the following objectives:

**O1.** Investigate the groups of reasons that hinder applying artificial intelligence in the sector of field of application.

**O2.** Arranging that groups according to the extent of their strong influence on the presence of the phenomenon under study.

### **Research Hypotheses**

This research develops two central hypotheses based on previous studies in order to answer the research questions. These hypotheses are as follows:

**H1.** There is a significant correlation relationship between employees' Personal factors and their perception towards challenges of applying artificial intelligence.

**H2.** There are no significant differences between the three groups that hinder applying artificial intelligence in commerce field.

### **Theoretical framework**

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**Table (1): Definitions of Artificial Intelligence**

Definitions	Research
Artificial intelligence is a broad term encompassing a range of algorithm-driven technologies, each with its own limitations that address complex tasks once requiring human cognition, extending to areas yet unexplored.	(DeWaard, 2023)
AI is a self-learning tool that relies on existing online knowledge and content, resulting in varying levels of accuracy, errors, and biases.	(Buchanan, 2023)
AI denotes the emulation of human intelligence by machines or systems.	(Xu et al., 2021)
It has been called a revolutionary tool for science and it has been predicted to play a creative role in research in the future.	(Melnikov et al., 2018)

Source: Prepared by the researchers based on Literature.

### Challenges of AI:

- 1) AI can also be exploited for malicious purposes, such as Deepfake AI, which creates highly convincing but deceptive images, audio, and videos. In response to these threats, countries in the European Union are proposing legislation, such as the AI Act, to regulate the expanding use of AI and protect against misuse. Similarly, the United States is pursuing similar measures, and other nations are expected to follow suit. (Krausman, 2023)
- 2) Addressing the potential replacement of human roles with machine intelligence. With numerous scientists delving into AI, the research

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landscape is both extensive and varied. Key areas of AI research include search algorithms, knowledge graphs, natural language processing, expert systems, evolutionary algorithms, machine learning (ML), deep learning (DL), among others. (Xu et al., 2021)

- 3) Concerns over the use of AI are also growing elsewhere and universities are developing programs to train a new cadre of professionals to deal with the rapid changes and development in AI in all fields. (Krausman, 2023)
- 4) The field of AI is expanding beyond many people's expectations. It's hard to turn on the news without encountering stories about AI, such as voice replication, its role in art and music creation, facial recognition, and more. While AI is increasingly utilized in managing big data across various domains, it also comes with significant risks and uncertainties. (Botes, 2023)

**Table (2): challenges of using Artificial Intelligence in commerce, developed by the researchers**

challenges related to employee	challenges related to investment and funding	challenges related to technology infrastructure
<ul style="list-style-type: none"> <li>• Lack of knowledge and training</li> <li>• Lack of awareness about the benefits of AI</li> <li>• Privacy and ethics</li> <li>• Resistance to change</li> <li>• Shortage of skilled</li> </ul>	<ul style="list-style-type: none"> <li>• Financial constraints</li> <li>• Absence of clear policies</li> <li>• Limited support for professional development</li> <li>• Difficulty in assessing technology ROI</li> </ul>	<ul style="list-style-type: none"> <li>▪ Non-supportive environment</li> <li>▪ Insufficient technological infrastructure</li> <li>▪ Lack of hardware</li> <li>▪ Lack of software</li> <li>▪ Lack of reliable internet connection.</li> </ul>

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employees.	• Lack of financial resources	▪ Inadequate technical support
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Source: Prepared by the researcher based on Literature.

### Research Significance

Artificial intelligence plays a significant role in providing the necessary technology for the different industries.. The findings of this research will benefit both the development of the science and the development of the field of application.

The food processing sector holds significant importance for the Egyptian economy for several key reasons:

1. Substantial Contribution to Gross Domestic Product (GDP):
  - The food processing industry contributes approximately 14% to Egypt's total GDP, making it the second-largest industrial sector after construction.
2. Employment and Job Creation:
  - The sector provides employment opportunities for over 2 million Egyptians, positioning it as one of the largest employers in the country.
3. Food Security and Economic Stability:
  - The sector plays a crucial role in maintaining food security for citizens through the production of essential commodities.
  - It also helps stabilize prices and control inflation.
4. Exports and Foreign Currency Earnings:
  - Exports from the food processing sector account for around 12% of Egypt's total exports.
  - The sector provides a valuable source of foreign currency for the state.
5. Investments and Development:

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- The sector attracts significant domestic and foreign investments.
- It contributes to the overall industrial and economic development of the country.

## Population and Sample Size

### 1. Population and Sampling

The population of the current research is the employees at food industries in Egypt.

#### Sample Size

The sample size required to be large enough to generalize the findings to a population. According to Sample Size Calculator, a sample size of 384 is required if the margin of error is 5%, which is the proportion utilized in social research, the confidence level is 95%.

### Data Analysis, Results, and Interpretations

Research data was collected during the period from July 2024 to August 2024. Using Google Form, the researchers designed an electronic version of the questionnaire which was published to the employees at food industries in Arab republic of Egypt through social media channels like Facebook Pages, Facebook Groups, and WhatsApp Groups interested in the employees at food industries in Arab republic of Egypt. Total responds were (407), while accepted responds were (400). Researchers exported the collected data from Google Form to Google Sheet then to Excel Sheet in which items were coded and formatted to be ready for Smart PLS.

### Sample Description

Accepted responses to the questionnaire were (400), described as follows:

#### 1. Sample distribution according to years of experience

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As shown in table 3, the number of segment (from 2-10 years) was (244) Responses, while the number of segment (more than 10 years) was (156).

**Table (3): Sample distribution according to years of experience**

Years of experience	N	Percentage
From 2-10 years	244	61 %
More than 10 years	156	39 %

Source: Prepared by the researchers according to statistical analysis

## 2. Sample distribution according to Gender

As shown in table 4, the number of males was (252) Responses, while number of females was (148) Responses:

**Table (4): Sample distribution according to Gender**

Gender	N	Percentage
Male	252	63 %
Female	148	37 %

Source: Prepared by the researchers according to statistical analysis

## 1. Test H1 :Direct relationships between research variables

**Table (5): Correlation among employees' personal factors & challenges of Applying Artificial intelligence**

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Variables	Barriers of applying AI	
	R	p
	Spearman- test	
Years of experience	.028	.634
Gender	.089	.122

Source: Prepared by the researchers according to statistical analysis

As shown in table 5, there is no a significant correlation relationship between employees' Personal factors and their perception towards challenges of applying artificial intelligence.

**Test H2.** There are no significant differences between the three groups that hinder applying artificial intelligence.

**Table (6): Mean and standard deviation of employees' personal factors & challenges of Applying Artificial intelligence related to the employee (n= 400)**

Statements	Mean	SD
1- The employee does not have sufficient skills and experiences for using AI	2.37	1.42
2- The employee does not have sufficient knowledge about using AI	2.2	1.50
3- lack of the employee awareness about the benefits of AI	4.25	1.01
4- The employees faces the difficulty of the lack of training programs in the field of AI	2.2	1.50
Overall mean		

Source: Prepared by the researchers according to statistical analysis

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**Table (7): Mean & standard deviation of researchers' personal factors & challenges of Applying Artificial intelligence related to investment and funding (n= 400)**

Statements	Mean	SD
1- Lack of financial resources.	2.65	1.34
2- AI is so expensive	3.15	1.59
3- Managers usually face financial constraints.	3.82	.888
4- Financial management faces difficulties in determining the ROI in using AI .	2.65	1.34
5- Limited support for professional development..	3.32	1.29
Overall mean		

Source: Prepared by the researchers according to statistical analysis

**Table (8): Mean and standard deviation of researchers' personal factors & challenges of Applying Artificial intelligence related to technological infrastructure (n= 400)**

Statements	Mean	SD
1- Lack of hardware.	3.43	1.066
2- Lack of software.	3.93	.999
3- Lack of supportive environment.	3.82	.888
4- Lack of reliable internet connection	3.26	1.091
5- Slow adoption of new technologies.	2.99	1.100
Overall mean		

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Source: Prepared by the researchers according to statistical analysis

**Table (9): The findings of the second hypothesis**

Groups	MEAN	F	Sig
Group (1)	162.733	1.218	0.303
Group (2)	158.389		
Group (3)	162.514		

Source: Prepared by the researchers according to statistical analysis

As shown in table 9 there is no significant differences in means between the three groups that hinder applying artificial intelligence.

## Findings and Recommendations

### Research Questions Revisited

Table 7 below shows the overall view for Research Questions, Objectives, Hypothesizes, and Results of Testing hypotheses as follows:

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**Table (9): Research Questions, Objectives, Hypothesizes, and Results**

Research Questions	Research Objectives	Research Hypothesizes	Results of Testing Hypothesizes
Q1. What is the nature of the correlation relationship between employees' Personal factors and their perception towards challenges of applying artificial intelligence?	O1. Investigate the groups of reasons that hinder applying artificial intelligence in the field of application	H1. There is a significant correlation relationship between employees' Personal factors and their perception towards challenges of applying artificial intelligence.	Rejected
O2. What are the significant differences between the three groups that hinder applying artificial	O2. Arranging that groups according to the extent of their strong influence on the presence of the food industry	H2. There are no significant differences between the three groups that hinder applying artificial intelligence in the food industry	Accepted

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Research Questions	Research Objectives	Research Hypothesizes	Results of Testing Hypothesizes
intelligence?	phenomenon under study.	field.	

Source: Prepared by the researchers based on Literature, Data, and Statistical analysis outputs.

### Research Findings and its Interpretations

Table 10 below shows the summary of research findings compared to literature:

**Table (10): Research Findings compared to Literature**

Research Findings	Compared to literature
There is not a significant correlation relationship between employees' Personal factors and their perception towards challenges of applying artificial intelligence.	<i>Within the researchers knowledge, there are no previous studies that have previously investigated this relationship</i>
There are no significant differences between the three groups that hinder applying artificial intelligence in food industry field.	<i>Within the researchers knowledge, there are no previous studies that have previously investigated this hypothesis.</i>

Source: Prepared by the researchers based on Literature.

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### Theoretical Implications

Based on current research, the researcher recommends these topics for future research:

1. Study the effects of research variables applied on other Sectors, such as Banks.
2. Study the role of leadership styles in reducing barriers of applying Artificial intelligence.

### Practical Implications

Based on the results of the current research, researchers summarized the practical recommendations in Table 11 as follows:

**Table (11): Research recommendations for the field of practice**

Practical Recommendations		Notes for application	
1. Food Companies should Provide regular training on artificial intelligence skills	Who?	Training department.	
	How?	Organize monthly workshops and training sessions focused on Artificial intelligence.	
	When?	Along the service cycle.	
2. Food companies should study the return of investment in AI	Who?	Financial departments	
	How?	Using financial methodologies	
	When?	Along the service cycle	

Source: Prepared by the researchers based on Literature.

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## References

- Botes, M. 2023. Regulating scientific and technological uncertainty: the precautionary principle in the context of human genomics and AI. South African Journal of Science.119:81–86.
- Buchanan, A. (2023). Artificial intelligence—The next frontier of scientific publications? Australian Occupational Therapy Journal, 70(3), 301–302.
- Dergaa, I., Chamari, K., Żmijewski, P., & Saad, H. (2023). From human writing to artificial intelligence generated text: examining the prospects and potential threats of chatgpt in academic writing. Biology of Sport, 40(2), 615-622.
- Krausman, P. R. (2023). Managing artificial intelligence. The Journal of Wildlife Management, 87(8).
- Krenn, M., Pollice, R., Guo, S. Y., Aldeghi, M., Cervera-Lierta, A., Friederich, P., Gomes, G. D. P., Häse, F., Jinich, A., Nigam, A., Yao, Z., & Aspuru-Guzik, A. (2022). On scientific understanding with artificial intelligence. Nature Reviews Physics, 4(12), 761–769.
- Melnikov, A. A., Nautrup, H. P., Krenn, M., Dunjko, V., Tiersch, M., Zeilinger, A., & Briegel, H. J. (2018). Active learning machine learns to create new quantum experiments. Proceedings of the National

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Academy of Sciences of the United States of America, 115(6), 1221–1226.

- Xu, Y., Liu, X., Cao, X., Huang, C., Liu, E., Qian, S., Liu, X., Wu, Y., Dong, F., Qiu, C., Qiu, J., Hua, K., Su, W., Wu, J., Xu, H., Han, Y., Fu, C., Yin, Z., Liu, M., . . . Zhang, J. (2021). Artificial intelligence: A powerful paradigm for scientific research. The Innovation, 2(4),100179.
- Mehta, A., & Ahmed, T. (2022). Artificial intelligence in business: The future is now. Journal of Business Research.
- Green, R. G., & Roberts, E. H. (2023). AI in commerce: The evolution and future directions. AI Open.
- Williams, S. M., & Lopez, C. R. (2021). Challenges and opportunities for AI in emerging markets. Information Systems Frontiers.

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