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Artificial Intelligence Adoption and Its Impact on Sales Forecasting in Food Export Firms

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ABSTRACT

Artificial Intelligence is really important for businesses these days. It helps them do things better, predict things accurately, and perform well in international markets. This study looks at how Artificial Intelligence affects sales forecasting in food export companies. The study focuses on important factors such as AI awareness, decision support systems, automation through AI, sales forecasting effectiveness, and export performance. Information was collected from 113 employees working in food export companies through a structured questionnaire using a scaling method. The collected data was analysed using Microsoft Excel. Statistical methods such as Cronbach's Alpha, Correlation, ANOVA, and Regression Analysis were used to interpret the data. The findings show that Artificial Intelligence improves sales forecasting accuracy and export performance. The results also indicate that AI awareness, decision support systems, and automation through AI play an important role in forecasting effectiveness. These factors explain nearly half of the variation in forecasting performance. The study concludes that Artificial Intelligence can help food export companies improve decision making, forecasting accuracy, and global competitiveness.

KEYWORDS

Artificial Intelligence, Decision Support Systems, Export Performance, Food Export Firms, Sales Forecasting

1 INTRODUCTION

Food processing, packaging, storage and import, as well as export, make up a huge portion of the food industry within India. Examples of food items that fall within this category are: processed foods, grains, spices, cereals (rice), dairy products (various types) fish (seafood) or ready-to-eat meals. Today, India is one of the world's largest exporter of rice/grain, spices, fish/seafood, spices, teas, coffees, meats and processed foods (mostly seafood/fish). Food exports from India occur mostly to countries in the Middle East, Europe, USA/Africa. In addition to having a very strong base of agriculture, a multitude of climatic conditions and availability of the same products throughout the year, this sector has benefited through the growth of agricultural production with government support via various programs such as: Increasing cold chain capabilities; Government support promoting exports; and creating better access to modern port facilities. In the last couple of years, there have been many changes to the food export industry. More people are moving away from traditional food and choosing organic, natural or healthy food. Several cities have grown dramatically and are now eating more packaged and prepared foods than ever before. In addition to all of these changes, more new regulations are being placed on the international food market to guarantee food safety and food quality. With all these new regulations and recent increases in technology, food export businesses can now use sophisticated analytical tools to identify what is happening in the marketplace, predict consumer demand and make more timely and informed decisions. All of these actions can be accomplished through the use of Artificial Intelligence (AI).

1.2 RESEARCH QUESTIONS

- How does AI awareness among employees influence sales forecasting effectiveness in food export organizations?
- To what extent do AI-based decision support systems contribute to improved export market understanding?
- Does automation through AI significantly improve the speed and accuracy of business decisions?
- What is the overall impact of AI tools on export performance in food product companies?

1.3 RESEARCH OBJECTIVES

Primary Objective: To examine the drivers of AI towards effective export market analysis and sales forecasting.

Secondary Objectives:

- To study the factors influencing the adoption of AI in export-oriented food businesses.
- To analyze the impact of AI-based tools on sales forecasting effectiveness and export performance.

1.4 DEVELOPMENT OF HYPOTHESIS

Based on the research questions and objectives, the following hypotheses were developed:

H₀: There is no statistical significant difference between AI Awareness, Decision Support Systems, Automation, Sales Forecasting Effectiveness, and Export Performance among the respondents.

H₁: There is a statistical significant difference between the construct groups among the respondents.

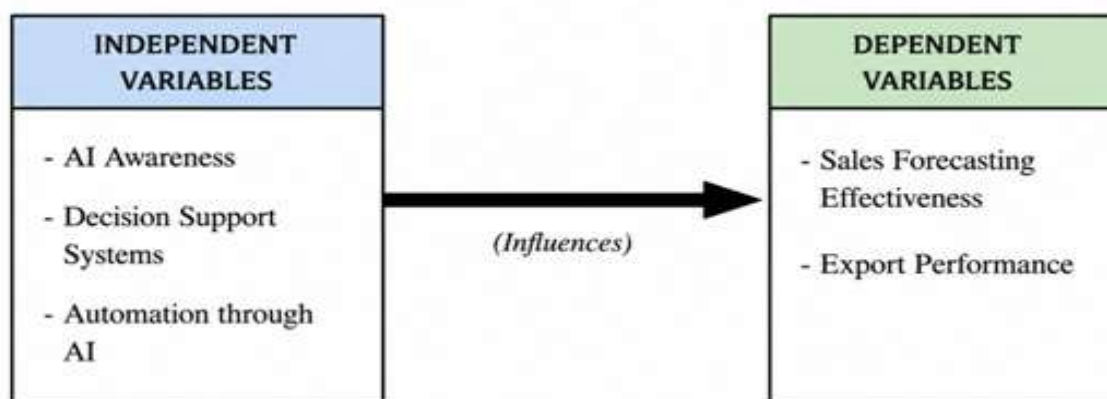
For Regression

H₀: There is no significant relationship between AI Awareness, Decision Support Systems, Automation and Sales Forecasting Effectiveness.

H₁: There is a significant relationship between these variables and Sales Forecasting Effectiveness.

CONCEPTUAL FRAMEWORK

Fig. 1. Conceptual Framework of the Study



Source: Author's own conceptual model

Conceptual Framework shows the link between independent and dependent variables adopted in the research. AI Awareness, Decision Support System through AI, and Automation through AI are seen as independent variables that affect sales forecasting effectiveness and export performance that are the dependent variables.

2. REVIEW OF LITERATURE

AI ADOPTION IN BUSINESS

The use of AI technology in firms has increased greatly because of digitalization and good decision making. As indicated by Chen et al. (2022), Artificial Intelligence technology can be applied by organizations in increasing efficiency and accuracy, building relationships with clients, earning revenues and facilitating learning among others. The application of AI technology by the authors will also help organizations to boost their business-to-business marketing as well as enterprise management. Similarly, Cubric (2020) has pointed out that the organizations apply AI technology in order to reduce costs, improve efficiency and boost productivity within the healthcare, IT, agriculture, tourism and logistics industries among others. Nonetheless, certain specific barriers to the application of AI technology have been pointed out by the author. They include ignorance about the technology, technical challenges, distrust and fear concerning job security. Further, according to Maiti et al. (2025), ethical issues relating to the adoption of artificial intelligence technology in business organizations should be addressed. Some of the ethical issues that have been identified are the issue of privacy, transparency and ethics-based decision making.

AI IN SALES FORECASTING

The application of Artificial Intelligence can prove helpful in enhancing sales forecasting accuracy and effectiveness for planning purposes. According to Venkataramanan, Gudala, and Reddy (2024), the conventional process of forecasting is dependent on past trends and human judgement, making it difficult to forecast accurately when changes take place in the market environment. The study emphasized that through the application of Artificial Intelligence approaches like machine learning, natural language

processing, and deep learning, it becomes easier for organizations to conduct a thorough analysis of customers' behavior and enhance forecasting performance. Likewise, according to Sohrabpour, Oghazi, and Toorajipour (2021), AI-based approaches assist in conducting comprehensive analysis and identifying relationships between variables affecting the performance of sales forecasts. Moreover, the significance of Artificial Intelligence in production planning, logistics management, marketing, and resource planning was also identified in the study. As per Mehendale and Nadheera Sherin (2018), Artificial Neural Networks are more flexible and accurate approaches in comparison to traditional approaches like ARIMA.

AI IN EXPORT PERFORMANCE

There have been certain findings of research studies which have focused on the positive correlation between AI capabilities and export performance. According to Kumar et al. (2025), AI capabilities are instrumental in contributing to market exploration, market exploitation, and international marketing capabilities of organizations, which in turn enhance export performance indirectly. It should be noted that environmental dynamism and market competition influence the correlation between AI and export performance. Also, according to Chishty et al. (2025), Artificial Intelligence enhances the export performance of organizations by increasing their operational efficiency and decision-making capabilities in situations of uncertainty in the global business environment. It is also significant to state that cultural awareness boosts the performance of international businesses. Lahmeri (2025) carried out an analysis of the impact of investments in AI on export performance in OECD countries. The analysis revealed that even though investments in artificial intelligence reduce export performance initially, it assists in stabilizing and enhancing export performance in the long run.

AI IN FOOD INDUSTRY

Currently, AI-related technological innovations have become widely applied in different industries, including in the food industry for reasons such as efficiency, food quality, automation, and sustainability. This can be seen from the findings presented by Mavani et al. (2022), where applications of AI technology are found in numerous areas, such as food quality, food classification, model predictive systems, and process control operations. In addition to that, both the strengths and weaknesses associated with using AI technologies in the food industry were also described in the above-mentioned research study. In addition to that, the roles played by computer vision, machine learning, and deep learning technologies in producing foods and agriculture were highlighted by Kakani et al. (2020). However, Song et al. (2025) argue that AI helps automate decisions in the food industry.

RESEARCH GAPS

The literature is well filled with research about Artificial Intelligence adoption, sales forecasting, export performance, and applications of Artificial Intelligence in the food sector. But very few works have been done that focus on the effect of Artificial Intelligence knowledge, decision support systems, and automation on sales forecasting effectiveness and export performance in food export companies, particularly in India. Moreover, past researches focused more on general businesses than on export food firms. The aim of this work is thus to fill this research gap by examining the effects of Artificial Intelligence on sales forecasting effectiveness and export performance in food export businesses.

3. RESEARCH DESIGN AND METHODOLOGY

3.1 RESEARCH DESIGN

This research adopts a descriptive research approach to investigate how employees perceive the use of Artificial Intelligence in analyzing export markets and predicting sales. In this research, there will be no experiments; rather, the aim is to analyze the gathered data using statistical techniques.

3.2 SAMPLE SIZE AND SAMPLING TECHNIQUE

The study involved 113 respondents who were conveniently sampled due to their availability and readiness to take part in the study. These respondents comprised of workers in various departments including Export Operations, Business Analytics, Sales, Marketing, Finance, and Supply Chain in food export firms.

3.3 DATA COLLECTION

The primary data was gathered using an online structured questionnaire that was developed with the help of Google Forms. Likert Scale of 5 points was used to gather information on the issues such as the awareness level regarding AI, decision support system, automation by AI, efficacy of sales forecasts, and performance in exports. The secondary data was collected from academic journals and industry reports.

3.4 QUESTIONNAIRE STRUCTURE

In two main sections: (1) A demographic section to collect useful identifying data; and (2) Twenty statement Likert scale survey item format covering and providing responses based upon five separate constructs (each with four individual statements);

- AIA (AI Awareness), measures the knowledge and understanding by employees of AI technology.
- DSS (AI Based Decision Support Systems), measures the degree to which AI systems/tools deliver appropriate support to management to enable effective decision making.
- ATM (Automation through AI), measures how much AI driven automation improves efficiency and/or speed.
- SFE (Sales Forecasting Effectiveness), measures the perceived improvements in future sales forecasting accuracy as a function of using AI technologies.
- EXP (Export Performance), measures the contribution of AI technology on an export companies overall competitiveness and performance..

3.5 DATA ANALYSIS TOOLS AND PERIOD OF STUDY

After compiling the data, it was subsequently entered into Microsoft Excel and coded before being analyzed using the Data Analysis ToolPak for statistical tests such as correlation, ANOVA, and regression.

3.6 LIMITATIONS

- The participants (n=113) were not necessarily a true reflection of the whole food export professional population.
- The data collected primarily relies on each respondent's personal beliefs and perspectives; this could lead to some bias within this research.
- The respondents selected for this research may only provide insight from their familiarity with AI and lack insight from other individuals that do not have experience with it.
- All results obtained through this research come directly from the questionnaire answered by each of the respondents; thus, there may exist additional characteristics related to the adoption of AI that were not addressed sufficiently.

4. DATA ANALYSIS AND INTERPRETATION

4.1 RELIABILITY ANALYSIS

Cronbach's Alpha of 0.891 was obtained for all 20 items, exceeding the acceptable threshold of 0.7 ("Good" range), confirming the questionnaire's internal consistency and suitability for further analysis.

Table 1 : Showing Reliability Analysis

Reliability Statistics	
Cronbach's Alpha	N of Items
0.891	20

4.2 ANOVA — SINGLE FACTOR

From the findings of the ANOVA test, it was observed that the value of F and P is 0.6355 and 0.6374 respectively. In the case of a P value of more than 0.05, the null hypothesis is accepted. Thus it can be seen that there is no difference between the five constructs. It means that people's attitude towards AI is same in all five constructs.

Table 1: ANOVA Single Factor

Summary

Groups	Count	Sum	Average	Variance
AIA total	113	1583	14.00884956	9.669563843

DSS total	113	1544	13.66371681	8.743046776
ATM total	113	1593	14.09734513	8.499367889
SFE total	113	1594	14.10619469	8.363621997
EXP total	113	1610	14.24778761	7.45591024

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	21.72389381	4	5.430973451	0.635476415	0.63736703	2.387848951
Within Groups	4785.929204	560	8.546302149			
Total	4807.653097	564				

4.3 CORRELATION ANALYSIS

Correlation analysis shows that all variables are positively related. The strongest link is between Sales Forecasting Effectiveness and Export Performance with a correlation of 0.6977. This means that better sales forecasting leads to export performance. There is also a link between AI Awareness and Decision Support Systems with a correlation of 0.6975. This shows that being aware of AI helps in using AI tools. All variables have strong positive correlations, ranging from 0.56, to 0.70. Sales Forecasting Effectiveness and Export Performance have a connection. AI Awareness and Decision Support Systems also have a connection. All variables are positively linked.

Table 2: Correlation Matrix

	AIA total	DSS total	ATM total	SFE total	EXP total
AIA total	1				
DSS total	0.697549	1			
ATM total	0.617427	0.671894	1		
SFE total	0.564823	0.617116	0.643687	1	
EXP total	0.604378	0.586566	0.603729	0.697651	1

4.4 REGRESSION ANALYSIS

A regression analysis was done to see how AI awareness, decision support systems and automation together affect forecasting effectiveness. The results showed a Multiple R of 0.6982 and an R squared of 0.4875. This means that AI awareness, decision support systems and automation explain 48.75% of the variation, in forecasting effectiveness.

Table 3: Regression Summary Output - Regression Statistics

Regression Statistics	Value
Multiple R	0.698215477
R Square	0.487504853
Adjusted R Square	0.473399482

Standard Error	2.098639483
Observations	113

ANOVA

	df	SS	MS	F	Significance F
Regression	3	456.6583066	152.2194355	34.56164687	8.90762E-16
Residual	109	480.0673572	4.40428768		
Total	112	936.7256637			

Coefficients

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.410418	1.0715730	3.1826283	0.0019020	1.2865958	5.5342415	1.2865958	5.5342415
AIA total	0.142022	0.0927157	1.5318009	0.1284688	-0.0417375	0.3257815	-0.0417375	0.3257815
DSS total	0.252209	0.1035579	2.4354477	0.0164949	0.0469614	0.4574583	0.0469614	0.4574584
ATM total	0.373125	0.0956731	3.9000051	0.0001666	0.1835048	0.5627471	0.1835048	0.5627471

5. FINDINGS OF THE STUDY

From the findings of the research, it is evident that employees in firms dealing with exports of food items have high levels of knowledge regarding Artificial Intelligence and its applications in businesses. It is evident that respondents are convinced that decision-making with the use of AI can be done effectively and fast by the management in such organizations. From the findings, it is clear that the automation of tasks using artificial intelligence plays a key role in helping with repetitive tasks and increasing efficiency in the organization. Amongst all the variables, automation was shown to influence sales forecast effectiveness the most. Moreover, it was observed that AI helps in improving the sales forecast accuracy which increases the planning process and market demand estimation in the competition in the market. AI helps organizations identify export opportunities and trends that allow quicker reactions to changing conditions in the market environment. From the findings, it is also clear that AI has a positive impact on the export performance of the organization. The study indicates that there is a shift from traditional approaches towards a data-driven approach.

6. PRACTICAL IMPLICATIONS

The study shows that food export companies need to put money into tools, like automation and decision support systems that use Artificial Intelligence. This will help them work better and make accurate guesses about the future. The study also says that companies should teach their employees how to use these tools. Companies should make decisions based on facts and numbers of just guessing. Food export companies should use Artificial Intelligence to make decisions. Policymakers and support organizations should also help smaller food export companies use Artificial Intelligence because they might not have the money to do it on their own. Using Artificial Intelligence can help food export companies make decisions do better and grow the food export industry. Food export companies can use Artificial Intelligence to improve their work and support the growth of the food export industry.

7. CONCLUSION

This study looked at how Artificial Intelligence's used in export market analysis and sales forecasting of food products. The results show that Artificial Intelligence really helps make decisions improves forecasting accuracy and helps understand export markets. Using Artificial Intelligence for automation was the factor in making sales forecasts more effective followed by Artificial Intelligence based systems that support decision making and the overall model was very accurate. All five important parts. Artificial Intelligence awareness, decision support systems, automation, sales forecasting effectiveness and export performance. Are. Important, which means that using Artificial Intelligence makes many areas of business performance better. Old ways of

analyzing markets and forecasting are not good enough for the amount of data, in global trade, which moves very fast and is very complicated. To stay competitive be more efficient and grow in a way food export businesses must use Artificial Intelligence effectively in their operations.

REFERENCES

- [1] L. Chen, M. Jiang, F. Jia, and G. Liu, "Artificial intelligence adoption in business-to-business marketing: toward a conceptual framework," *J. Bus. Ind. Mark.*, vol. 37, no. 5, pp. 1025–1044, 2022, doi: 10.1108/JBIM-09-2020-0448.
- [2] M. Cubric, "Drivers, barriers and social considerations for AI adoption in business and management: A tertiary study," *Technol. Soc.*, vol. 62, p. 101257, 2020, doi: 10.1016/j.techsoc.2020.101257.
- [3] M. Maiti, P. Kayal, and A. Vujko, "A study on ethical implications of artificial intelligence adoption in business: challenges and best practices," *Future Bus. J.*, vol. 11, no. 1, p. 34, 2025.
- [4] S. Venkataramanan, A. K. R. Sadhu, L. Gudala, and A. K. Reddy, "Leveraging artificial intelligence for enhanced sales forecasting accuracy: a review of AI-driven techniques and practical applications in customer relationship management systems," *Aust. J. Mach. Learn. Res. Appl.*, vol. 4, no. 1, pp. 267–287, 2024.
- [5] V. Sohrabpour, P. Oghazi, R. Toorajipour, and A. Nazarpour, "Export sales forecasting using artificial intelligence," *Technol. Forecast. Soc. Change*, vol. 163, p. 120480, 2021.
- [6] A. Mehendale and N. S. HR, "Application of artificial intelligence (AI) for effective and adaptive sales forecasting," *J. Contemp. Manage. Res.*, vol. 12, no. 2, 2018.
- [7] S. Kumar, V. Kumar, S. Chatterjee, M. Mariani, and A. De Massis, "The role of artificial intelligence capabilities in enhancing export performance: a study of ambidexterity and dynamic capabilities," *Int. Mark. Rev.*, vol. 42, no. 4, pp. 698–714, 2025.
- [8] S. K. Chishty, S. Sayari, A. H. Mohamed, M. F. Mallick, N. Khan, and A. Inkesar, "The utilisation of artificial intelligence in the export performance of MNCs: The role of cultural distance," *Adm. Sci.*, vol. 15, no. 5, p. 160, 2025.
- [9] H. Lahmeri, "Artificial intelligence and export performance: Insights from OECD countries," *Int. J. Bus. Econ. Stud.*, vol. 7, no. 4, pp. 258–271, 2025, doi: 10.54821/uiecd.1786964.
- [10] N. R. Mavani, J. M. Ali, S. Othman, M. A. Hussain, H. Hashim, and N. A. Rahman, "Application of artificial intelligence in food industry—a guideline," *Food Eng. Rev.*, vol. 14, no. 1, pp. 134–175, 2022.
- [11] V. Kakani, V. H. Nguyen, B. P. Kumar, H. Kim, and V. R. Pasupuleti, "A critical review on computer vision and artificial intelligence in food industry," *J. Agric. Food Res.*, vol. 2, p. 100033, 2020, doi: 10.1016/j.jafr.2020.100033.
- [12] X. Song, X. Zhang, G. Dong, H. Ding, X. Cui, Y. Han, and L. Wang, "AI in food industry automation: Applications and challenges," *Front. Sustain. Food Syst.*, vol. 9, p. 1575430, 2025, doi: 10.3389/fsufs.2025.1575430.