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CONSUMER PERCEPTIONS OF AI USE IN RETAIL

Abstract: All supply chain members, from suppliers to retailers, should adjust and synchronize their activities to meet consumer needs. Consumers are not only the final destination in the flow of products and services but also a crucial starting point for many supply chain management (SCM) activities. Various technologies and advancements are continuously developed and implemented to ensure the right value is delivered at the right time and place. Among these technologies, artificial intelligence (AI) has gained increasing attention, influencing nearly all aspects of supply chain management. From a consumer perspective, the application of AI is particularly significant in the retail sector, where both online and offline transactions take place. To effectively integrate AI solutions with consumer preferences, it is essential to analyze their perceptions. Therefore, in addition to discussing supply chain management and the application of AI technology, this research examines consumer perceptions of AI use in retail.
Keywords: Consumer, Artificial Intelligence, Retailer, Supply Chain Management

1. INTRODUCTION

The increased competition within the business environment, along with uncertainty and dynamism, presents challenges that attract significant attention in supply chain management; additionally, a crucial role is played by the need to satisfy increasingly demanding consumer expectations (Sandberg & Jafari, 2018).

These challenges affect all SCM members, especially retailers, due to their supply chain characteristics. According to Ge et al. (2019), the retail supply chain differs from the manufacturing supply chain in three key ways: it involves a large number of partners and end customers, has inventory costs as a major expense, and needs to focus on fulfillment in terms of service quality and delivery speed. Hence, retailers are compelled to operate more efficiently and invest significant effort in understanding consumer requirements.

To achieve this, various technologies and advancements are continuously developed and implemented, with artificial intelligence now playing a crucial role. Therefore, after reviewing several studies on this topic, the research methodology and results regarding consumer perceptions of AI use in retail are presented.

2. LITERATURE REVIEW

Described as „algorithms, programmes, robots, and other systems that mimic intelligent human behaviour“, artificial intelligence has the potential to enhance a product's or service's intelligence and, consequently, impact the retail sector

(Mohanty et al., 2023, p. 1098). According to the Consumer Technology Association, its main benefits in the retail business include cost savings, increased productivity, automated processes and tasks, faster delivery of new products and services, greater innovation, and the ability to identify new revenue stream (Figure 1).

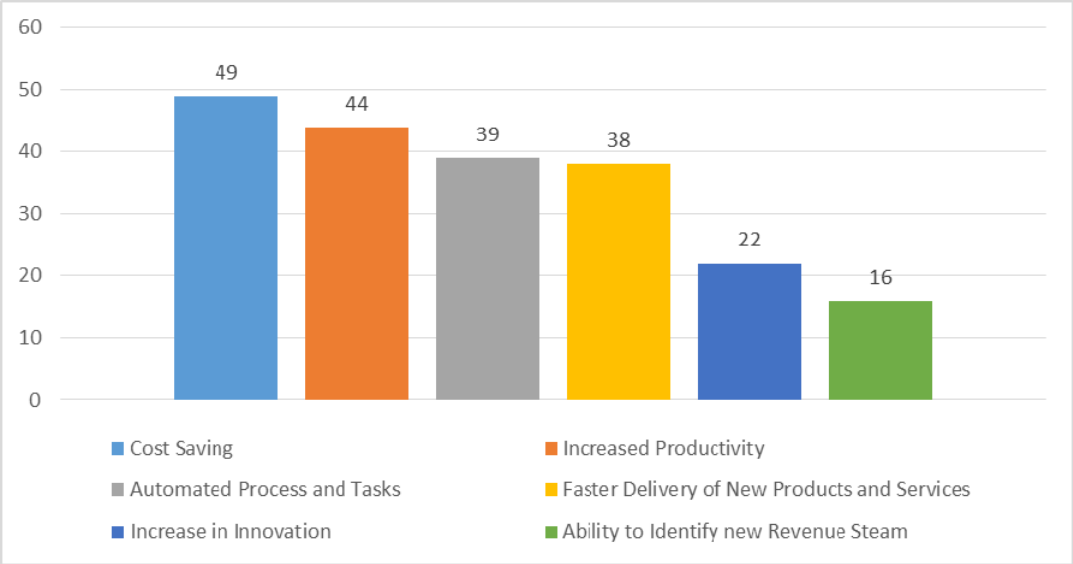

Figure 1: Benefits of Artificial Intelligence for Retail Business, in %, Global, 2018
Source: Mohanty et al. (2023, p. 1101)

The research by Anica-Popa et al. (2021) focused on identifying the practical benefits and risks associated with the implementation of AI in the retail sector. As a result, they developed a conceptual framework, abbreviated as CECoR, where CE stands for customer experience (which can be improved through the use of virtual agents), Co for cost (which can be reduced with the implementation of smart shelves), and R for revenue (which can be increased through product recommendations and the personalization of offers or discounts).

Certain studies emphasize consumers' perceptions of AI in the retail context. For instance, Bunea et al. (2024), based on the TAM model, examined the influence of AI tools on purchase intentions in online settings, focusing on Generation Z. Similarly, Myin and Watchravesringkan (2024) also relied on the TAM model, incorporating behavioral reasoning theory, and developed and tested a conceptual model to examine consumers' intention to use AI chatbots in apparel shopping. On the other hand, Purcărea et al. (2021) explored consumers' perceptions of artificial intelligence regarding its use in retail.

3. RESEARCH METHODOLOGY

This study aimed to conduct an initial assessment of consumers' perceptions of AI-enabled interactions with retailers, and a sample size of 31 was deemed sufficient for this purpose. The majority were female (over 70%), with an average age of 24. The findings provide an early understanding of this topic and serve as a foundation for more extensive future research.

Accordingly, we adapted 14 statements from the study by Purcărea et al. (2021). They were evaluated using a 5-point Likert scale, where 1 represents „totally disagree" and 5 represents „totally agree":

1. Interaction with a retailer through artificial intelligence (AI) enables a higher level of personalization (P1).
2. Interaction with a retailer through artificial intelligence (AI) is more reliable (P2).
3. Interaction with a retailer through artificial intelligence (AI) provides better privacy protection and security of personal data (P3).
4. Interaction with a retailer through artificial intelligence (AI) requires less personal effort (P4).
5. Interaction with a retailer through artificial intelligence (AI) allows for faster resolution of customer support issues (e.g., via chatbots or virtual agents) (P5).
6. Interaction with a retailer through artificial intelligence (AI) is available 24/7 (P6).
7. Interaction with a retailer through artificial intelligence (AI) provides greater control over the communication process (P7).
8. There are other aspects of interaction with a retailer through artificial intelligence (AI) that suit me (P8).
9. Interaction with a retailer through artificial intelligence (AI) provides an experience similar to interacting with a human (P9).
10. Interaction with a retailer through artificial intelligence (AI) enables greater empathy (P10).

11. Interaction with a retailer through artificial intelligence (AI) allows for a better understanding of emotions and more appropriate responses to them (P11).
12. Interaction with a retailer through artificial intelligence (AI) demonstrates human-like intellect (P12).
13. Interaction with a retailer through artificial intelligence (AI) is supported by a voice similar to a human voice (P13).
14. Interaction with a retailer through artificial intelligence (AI) has other human-like qualities (e.g., pleasant conversation) (P14).

In addition to descriptive statistics, the ANOVA approach was used to analyze differences among the applied statements. All analyses were conducted using the statistical software SPSS.

4. RESULTS

The overall mean value of all statements was 3.29. The mean values of responses to AI-related statements are detailed in Table 1.

Table 1: Descriptive statistics

Statements	N	Minimum	Maximum	Mean	Std. Deviation
P1	31	2	5	3.77	1.055
P2	31	1	5	2.77	1.055
P3	31	1	5	3.06	1.209
P4	31	2	5	4.32	0.909
P5	31	2	5	4.03	0.836
P6	31	3	5	4.71	0.529
P7	31	2	5	3.39	1.202
P8	31	2	5	3.65	0.798
P9	31	1	5	2.71	1.296
P10	31	1	5	1.90	1.193
P11	31	1	5	2.06	1.237
P12	31	1	5	3.03	1.048
P13	31	1	5	3.26	1.064
P14	31	2	5	3.39	0.919

Source: Authors

As shown, the highest average value (4.71) was recorded for statement P6, referring to 24/7 availability. Statements P4 and P5, related to reduced personal effort and customer support, also recorded average values above 4.

On the other hand, the lowest mean value (1.90) was recorded for statement P10, which is associated with empathy. Other statements with mean values below 3 were P2, P9 and P11, related to reliability, human-like experience and understanding of emotions. All mean values are visually represented in Figure 1.

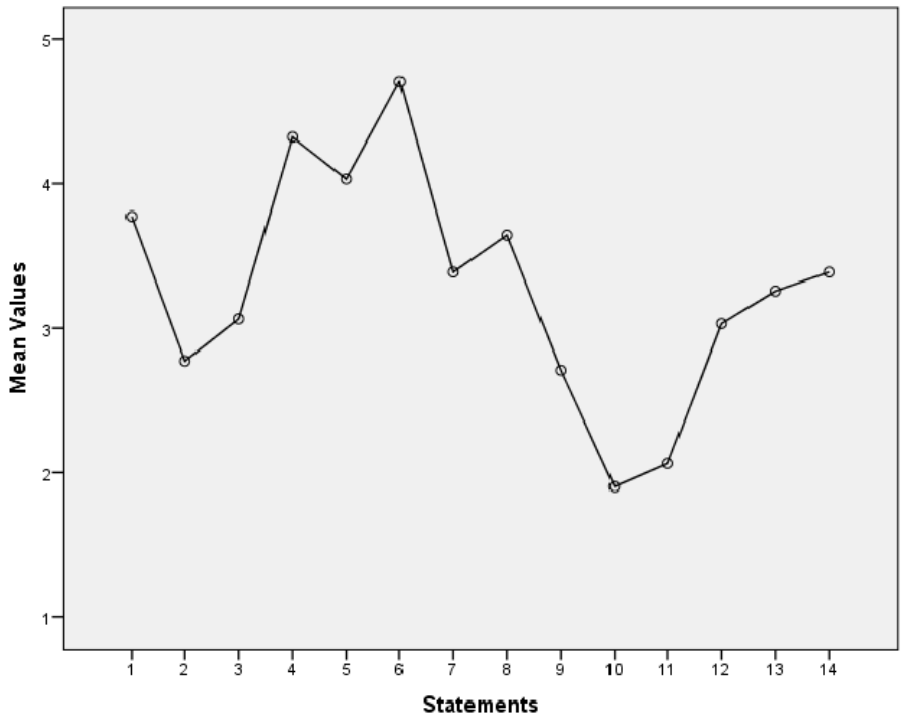

Figure 2: AI perceptions – Statements
Source: Authors

To test the significance of differences among them, the ANOVA method was applied, and the results are presented in Table 2.

Table 2: ANOVA method

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	252.903	13	19.454	17.820	0.000
Within Groups	458.516	420	1.092		
Total	711.419	433			

Source: Authors

Given that the p-value was lower than 0.05 (p = 0.000), it can be concluded that there is a statistically significant difference in the mean values of respondents' perceptions across the analyzed statements. To examine individual differences between statements, we applied the Tukey test for pairwise comparisons. The results for statements P6 and P10 are presented in Table 3.

Table 3: Tukey post-hoc test for P6 and P10

(I) P	(J) P	Mean Difference (I-J)	Sig.
6	1	0.935	0.031
	2	1.935	0.000
	3	1.645	0.000
	4	0.387	0.974
	5	0.677	0.375
	7	1.323	0.000
	8	1.065	0.005
	9	2.000	0.000
	10	2.806	0.000
	11	2.645	0.000
	12	1.677	0.000
	13	1.452	0.000
	14	1.323	0.000
10	1	-1.871	0.000
	2	-0.871	0.066
	3	-1.161	0.001
	4	-2.419	0.000

	5	-2.129	0.000
	6	-2.806	0.000
	7	-1.484	0.000
	8	-1.742	0.000
	9	-0.806	0.129
	11	-0.161	1.000
	12	-1.129	0.002
	13	-1.355	0.000
	14	-1.484	0.000

Source: Authors

The mean value of respondents' perception for P6 is statistically significantly higher than all other mean values, except for statements P4 and P5, where no significant difference was recorded. In the case of P10, statistically significant differences were observed compared to all other statements, except for P2, P9, and P11.

5. CONCLUSION

Market uncertainty and increasingly demanding customers compel retailers to modernize their supply chains by adopting new technological solutions. Nowadays, artificial intelligence (AI) is one of the key tools that can provide numerous benefits for both retailers and their partners.

However, before implementing any changes, it is essential to examine consumer perceptions. This study offers an initial assessment of perceptions toward AI use in retail. The overall mean value exceeded 3, indicating a relatively positive perception of AI-enabled interactions with retailers. The highest values were recorded for statements referring to the „technical" aspects of AI applications, such as 24/7 availability, reduced personal effort, and customer support. Conversely, the lowest mean values were mostly associated with statements linked to „human" and „emotional" aspects. Thus, while AI is perceived as a useful tool for enhancing retailer-consumer interactions and improving efficiency, it lacks empathy and emotional sensitivity, which remain primarily associated with human employees.

Given these findings, it would be valuable to expand this research by incorporating a variable related to AI knowledge. Additionally, future studies could include respondent characteristics such as age, education, and other demographic factors to gain deeper insights into how different groups perceive AI in retail.

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