Improving Customer Experience Using Artificial Intelligence in Online Retail

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Abstract: *This paper presents research on precursors that can generate unique and attractive retail experiences when using artificial intelligence. Among them are safe technology, ethical aspects, and customer-friendly technology. The motivation for choosing this topic is that it gives a global, current perspective and arouses interest, curiosity, uncertainty, even fear. Quantitative research was implemented with the help of an online questionnaire. The conceptual model derived from the literature was then analysed through regression analysis. Data collected from 272 consumers allowed the research hypotheses to be validated. The results reveal that artificial intelligence applied in retail is the solution for achieving higher performance in the retail field, but without being used unethically. The results provide an overview of AI in retail today, with survey participants expressing confidence in AI's ability to improve their shopping experience. The originality of the research consists of approaching for the first time in the considered emerging market the perception of consumers toward the vectors that enhance their in-store shopping expectations. Considering the direction in which technology is evolving and based on the arguments of specialists, it can be stated that Artificial Intelligence will represent an element of distinction and competitive advantage. Companies in the retail sector that will invest in the development of Artificial Intelligence will benefit in the long term. Artificial intelligence should not be absent from the retail context, and further investment should be made in its development. The present study did not determine the actual purchase experience in virtual retail stores but was based on a hypothetical situation. Also, this study used a limited sample of respondents, with only Millennials participating. A future research perspective could be based on this study, but using a larger and more representative sample.*
Keywords: Artificial intelligence, retail, customers, trends, innovation, stores, technology, virtual reality.

Introduction

Millennials prefer stores that offer an experiential environment because the shopping atmosphere and how they feel matters more than the product or the brand itself. They are prepared to spend more on a product that provides an authentic, unique, memorable, and/or attractive experience. Before the pandemic, Millennials were the most reliant on e-Commerce, but in pandemic they made little changes towards increased reliance on e-Commerce (Luo et al., 2023).

Experiences allow better socialisation with friends and/or colleagues, facilitating their access to society. Young consumers appreciate the decoration of the stores they shop in, women pay more attention to the music in the store, to the cleanliness and spaciousness between the shelves, to the extent that they can spend a pleasant time with friends, so that shopping offers a complete experience (Woo, 2018). On the other hand, retailers must ensure that they offer attractive and unique experiences to customers (Dabija and Bejan, 2018), artificial intelligence and virtual reality, respectively, robot-based technology being elements that compete to attract customers to

stores and facilitate their purchases, respectively, to generate an intensive and unique shopping experience.

Innovation and technology play an increasingly important role in retail, with stores always looking for ever more diverse ways to capture consumers' attention, attract them to shop, and above all keep them long-term as customers. A successful adoption of artificial intelligence in retail by enhancing customer experience with the help of artificial intelligence must be based on ethical principles but also on the degree to which clients consider the used technology is safe and also customer friendly. To overcome such challenges, the present endeavour seeks to relieve the antecedents of customer experience with Artificial Intelligence in retail, namely safe technology, ethical aspects, and customer-friendly technology. The research is implemented in an emerging market, where artificial intelligence is not yet properly implemented, with customers being asked to think of such situations where their shopping journey and experience could be enhanced by artificial intelligence.

The structure of this work is done as follows: in Section 1 we present the hypothesis and the conceptual model development, whereas in section 2 we present the research methodology with the design of the study, the data sampling and collection and also the implemented analysis. The last section contains discussions and the results. The article's conclusions contain managerial and theoretical implications, as well as limitations and future research perspectives.

1. Literature review: Hypothesis and conceptual model development

Virtual reality (VR) realises the possibility of recreation of objects and physical spaces through their digital representation. Individuals are typically introduced to the digital environment through a headset. The more real the virtual experience, the more it increases the individual's belief to further experience the digital environments they interact with, increases the level of escape and pleasure, augmenting their shopping experience (Serrano et al., 2016). Virtual reality and augmented reality have emerged as used both in the physical and online commerce to improve customer interaction and enhance in-store shopping behaviour and are rapidly developing technologies. However, the practical applications of AR and VR in retail are still quite fragmented (Bonetti, 2017).

Artificial intelligence is changing the customer experience so that the sales assistant can better recognize the decision-making action the shopper went through, thus being able to give additional guidance, in order to simplify the buying process (Hilton, 2020). To perceive retailing and consumer experiences, consumers have to understand that consumers are trying to reach a specific objective by purchasing and using a specific product or service (Puccinelli, 2009). Recent research (Kamoonpuri & Sengar, 2023) pinpointed the fast development of artificial intelligence-enabled virtual assistants are rapidly developing because it has the advantages of providing customised shopping assistance and front-line services 24/7.

For most organisations, customer experience has become the main point of convergence (Beranek, 2018). Retailers recognise that better customer understanding can improve customer satisfaction and retail store performance (Puccinelli, 2009). What customers really care about is finding an answer to their current needs. Technology and artificial intelligence fully favour the changing lifestyle of customers (Cook, 2014). Therefore, retailers must adapt and offer customers a pleasant experience that customers want to return to shopping (Cook, 2014).

Modern technologies including augmented reality, virtual assistants, chatbots, the Internet of Things, mixed reality, virtual reality based on artificial intelligence offer customers the possibility of enhancing their shopping experiences. (Hoyer, 2020). They will have radically new

experiences thanks to emerging technologies. When a person walks into a store and looks at different items of clothing, when they try on an article of clothing "smart mirrors" (with a screen connected to the digital world) will be able to provide personalised information such as how the article of clothing fits tried on, how often it can be worn, and how it matches or complements the customer's wardrobe (Libai et al., 2020). Virtual reality will allow the visualisation of clothing items in different lighting conditions and social contexts (for office work, walking outside, party, business meeting, etc.), helping to enhance the customer's shopping experience. At the same time, technological developments will probably allow the customer to interact with virtual assistants, who based on the customer's shopping history, his sociodemographic data, but also his preferences, attitudes, and/or lifestyle will provide him with the most suitable solutions for his needs (Hilken, 2017; Sauer, 2017). In fact, chatbots still today offer the possibility of personalised communication, under conditions of competence even better than the discussion with a human salesperson. Technology based on artificial intelligence will probably allow leaving the store with the new clothing items without having to scan them individually at the cash register, their value being automatically deducted from the customer's account (Libai et al., 2020). Thus, the customer experience will change significantly, the customer journey acquiring other values and allowing artificial intelligence to intervene in the different stages of the purchase process, so that the customer experience can be maximised. Artificial intelligence based modern technologies have the capacity of determining how individuals search for products, services and/or brands, evaluate them, choose them and/or buy them depending on the perceived satisfaction. Artificial intelligence enables the significant improvement of the customer relationship management (Libai et al., 2020).

Thanks to the new artificial intelligence-based technologies, such as virtual assistants, chatbots etc., customers' experience within the retail store has the chance of being enhanced, opposite to real and/or daily life happenings. Through computer-generated displays augmented and interactive experiences are facilitated, thus generating interaction, vividness and new, improved experiences (Hilken, 2017; Sauer, 2017). Thus, additional information (textual, visual, and sensory) can be displayed on a portable device or smartphone (reference). Such technologies will provide relevant, new, fast, and convenient information for consumers before, during, and after the actual purchase. They are likely to revolutionise the product trial, favouring the entire consumer experience (Hilken et al., 2018). Retail companies must ensure that these technologies are safe for the customer and can be used by them without any restrictions (Hilken et al., 2018). Of course, teaching consumers of different ages how to use them correctly will certainly be a long-term process. Therefore, we argue that:

H₁: *Safe technology generates customer experience with Artificial Intelligence (AI).*

As technologies become more "intelligent" and autonomous, there is a possibility that they will begin to make decisions on their own. The development of a relationship between man and machine must be guided by law and regulation. Of course, the legislation will have to be adapted to the new situation of human coexistence with machines, clearly highlighting what ethical boundaries are and when they are violated (Holder, 2016). Innovative technologies and robotics will continue to grow in importance in society, in all sectors of activity, but also in retail, affecting the way in which ethical aspects are applied and demanding precise regulations of what can and cannot be allowed. Robots are functional objects that physically interact with the material world, being controlled by means of specialised software, but subject to copyright on the embedded technology (Clark, 2020).

Until now, the legislation of ethics regarding the use of robots in various activities has focused on highlighting some good practices capable of providing protection to public security, the

physical integrity of people, and respectively the environment (Clark, 2020). In the patenting of an invention, respectively, in the acceptance of a technology based on robotics, certain standards of conduct accepted at the level of society must be considered (Pelau et al., 2021). To the extent that robots are used for certain activities performed by humans, it must be seen whether this approach is an ethical one, as well as whether replacing humans with technology is against morality or not. At the same time, labour legislation must be adapted in this sense to the changing economic environment, defining appropriate good practices. Ethical concerns that are increasingly affecting retail companies and their activities include consumer privacy rights when data is collected about each individual, developing, and following protocols regarding incidental findings encountered during data collection; determining consumer preferences based on artificial intelligence and/or different algorithms, establishing intellectual property rights when neuroscience research tools are involved, etc. (Clark, 2020).

The perceived ethics towards retailers positively impacts consumer loyalty depending on customers' perceived trust with the products and brands sold within retail stores. Consumers expect retailers to contribute to the overall progress of society by improving the consumer's in-store experience. Consumers are interested in the socio-ethical behaviour of retailers (Pimentel et al., 2022) and the good practices adopted by them in order to implement ethical principles in their activities (Dabija et al., 2016).

The retailers' compliance with ethical principles in the conduct of their activities causes customers to develop trust in the retail chain and to visit it more often, respectively, to identify with the products and brands distributed by it. By following ethical principles, the retailer can also benefit from increased customer satisfaction and loyalty. The application of ethical principles within the retail chain is a good retail practices that contributes at the same time to the generation and enhancement of the store customer experience. By resorting to different artificial intelligence technologies, namely robots, retailers must follow the established ethical principles, thus having the opportunity to strengthen the consumer experience and implicitly gain their trust and loyalty. Based on these arguments, we posit that:

H₂: *Ethical principles have a positive influence on customer experience with AI*.

Human enhancement technology (HET) has a notable and beneficial impact on customer experiences, but also generates some possible drawbacks. The use of applications and innovative technologies has already revolutionised the front-end interface, with human interaction enhancement technologies (HETs). When employees interact with customers, this interaction can be supplemented with HET (Grewal et al., 2022). That is why it is important to evaluate the extent to which companies in general and retailers in particular could integrate such technologies in the sales space to ensure full safety, complete and competent service, but also to generate a unique shopping experience for customers.

Such HET technologies have the ability to interact on an emotional, physical and cognitive level with the customer, enhancing his shopping experience. From a physical perspective, these technologies can bring extra physical strength, muscle mass, endurance, or mobility, the robot not needing sleep or rest, not ageing, not going on strike, etc. Cognitive improvements contribute to increasing cognitive capacity, enhancing the individual's sensory perceptions, making decision-making more attractive. On an emotional level, technology enables the enhancement of affective skills, positive personality and sociability traits such as confidence, openness and trust (Grewal et al., 2022). Therefore, we consider the following.

H₃: *Customer-friendly technology has a positive influence on customer experience with AI*. Based on these assumptions, we propose the theoretical model presented in Figure 1.

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┌─────────────────────────────┐
│      Safe Technology        │──H₁─┐
├─────────────────────────────┤     │
│      Ethical Aspects        │──H₂─┼──▶ ┌──────────────────────────────┐
├─────────────────────────────┤     │    │  Customer Experience with AI │
│ Customer Friendly Technology │──H₃─┘    └──────────────────────────────┘
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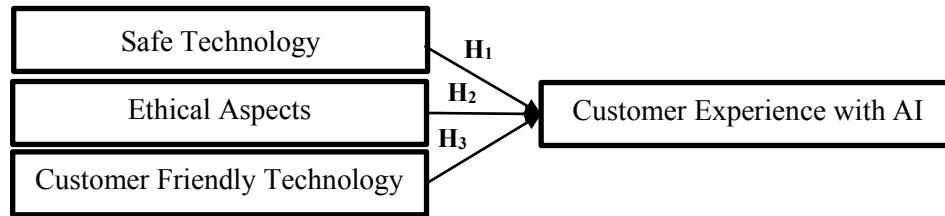
2. Research Methodology

To implement the research question, namely, to highlight the antecedents of customer experience with Artificial Intelligence in retail, namely, safe technology, ethical aspects, and customer friendly technology, the authors resorted to conducting empirical research through the survey technique. The working tool used was the questionnaire. It was operationalised according to the specialised literature, each construct in Figure 1 being explained through several items, included in the questionnaire. Each item was formulated by a statement, which the respondents evaluated on a five-point Likert scale (1 total disagreement – 5 total agreement). For efficiency, but also due to pandemic restrictions, the questionnaire was applied online through Google Forms between March and June 2022. Questionnaires with missing or incomplete answers, respectively, where respondents did not indicate sociodemographic data, were eliminated in order not to create bias (Churchill, 1991). The sampling was of convenience, as the research was intended to be only experimental one to reveal the way in which the experience can be generated with artificial intelligence in retail.

Of the 272 participants, 173 (63.6%) are women and 99 (36.4%) are male. 106 people (39%) are between 19 and 22 years old, 82 (30%) between 22 and 26 years old, and 58 (21%) between 26 and 32 years old, the rest – 26 (10%) are over 32 years old. From the perspective of education, 129 (47.4%) have completed high school studies, and 130 respondents (47.8%) have completed higher bachelor's or master's studies. The rest of the respondents (4.8%) fall into another situation (professional, doctoral studies, etc.). The overwhelming majority of the respondents - 254 (93.4%) declared that their mother tongue was Romanian, the rest having Hungarian, German or another mother tongue.

3. Results and Discussion

3.1. Reliability and validity

After collection, the responses to the questionnaires were systematized in the form of tables, which were later processed in SPSS. In order to verify the reliability, correctness, and internal consistency of the data, several specific tests were carried out. Therefore, recourse was made to the Cronbach alpha coefficient (α) (α >0.7), the "item-to-total" correlation, the KMO criterion (>0.7), but also to the Bartlett test of sphericity, specific to exploratory factor analysis (Churchill, 1991; Dabija, 2010). The results thus obtained are shown in table no. 1. The values obtained indicate an increased degree of creditworthiness and consistency of the statements. In the case of safe technology, respectively, of the construct of ethical aspects, it is found that the initial structure of seven elements could not be respected, the reliability of the scales (α) being higher after the elimination of one element. Therefore, it was decided to abandon the items that reduce reliability (Table No. 2), the creditworthiness indicators are under slight improvement.

Table 1. Results of testing the validity and data confidence test

Construct	Items	$α^1 > 0.7$	$KMO^2 > 0.7$	$χ^2$; df; p^3	Eigenvalue	% variance
Safe Technology	5	0.823	0.755	564,654; 10; ***	2.977	59.539
	4	0.849	0.764	487,351; 6; ***	2.756	68.908
Ethical Aspects	5	0.813	0.805	461,109; 10; ***	2.914	58.283
	4	0.824	0.778	385,733; 6; ***	2.619	65.466
Customer Friendly Technology	5	0.927	0.866	1088,126; 10; ***	3.886	77.719
AI Experience	9	0.925	0.923	1730,726; 36; ***	5.680	63.108

[1] – Cronbach α (data reliability)

[2] – Kaiser-Meyer-Ohlin Criterion (exploratory factor analysis) for each construct

[3] -Bartletts test of Sphericity ($χ^2$ – chi square, df – degrees of freedom, p – probability; ***p < 0,001)

Source: The authors' own research.

Due to the fact that the individually analysed dimensions (factors) proved to be stable, they were integrated into a single exploratory factor analysis, using the oblique rotation, specific to exploratory empirical research (Walsh and Beatty, 2007). And in this case, the resulting indicators show increased creditworthiness (KMO = 0.910, $χ2$ = 4279.430***; df = 231). Table no. 2 shows for each individual construct the results of the exploratory factor analysis carried out on all the factors, the references from which the scales were adapted, respectively, the creditworthiness indicators (eigenvalue and variance percentage).

Table 2. Operationalisation of the investigated dimensions and the values obtained from the exploratory factor analysis.

| Statement	Reference	Item Loading
The AI experience (EV: 9.589; % of var.: 43.585%)		
The virtual store creates an experience similar to that of a real store	Domina, 2012;	0.714
I can easily interact with the online store		0.669
The online store offers me the opportunity to interact with the products (for example with VR)	Papagiannids, 2013;	0.741
The shopping experience in the online store seems safe to me		0.715
The brightness of the colours of the products and the virtual store allows me to visualise how the products and the real store look	Reese, 2017.	0.780
It allowed me to enjoy being immersed in a new existing experience		0.829
It helped me make a better decision about the product if I should consider buying it		0.836
It helped me find the right product		0.818
It helped me in evaluating the product		0.781
Ethical aspects (EV: 2.527; % of var.: 11.487%)		
ETIC1_It is okay for there to be technologies that do not help customers who are thought not to buy	Burs, 1994;	0.676
ETIC2_Is it ethical to automatically recommend a more expensive product for sale when a cheaper one would be better for the customer	Renko, 2010.	0.789
ETIC3_It is correct to give preferential treatment to certain customers - only certain customers can use technologies, for example: VR technology when shopping		0.788
ETIC4_It is ethical to put pressure on customers so that they buy as much as possible		0.672
Customer-Friendly Technology (EV: 1.970; % of var.: 8.955)		
To use technology for stock coverage	Vlachos, 2014	0.848
Facilitate on-time delivery with the help of technologies		0.914

Statement	Reference	Item Loading
To offer fast, qualitative, personalised services with the help of technologies		0.871
To use data extraction solutions for suppliers		0.781
To take care of the ordering process and all transactions with suppliers so that everything is done online		0.815
Safe Technology (EV: 1.194; % of var.: 5.426)		
The use of a new technology is safe in terms of perceived risk in the transaction	Pantano, 2012	-0.629
In terms of privacy, the use of a certain new technology is safe		-0.730
Thanks to the new technologies used (for example, virtual reality), the shopping experience can be improved		-0.710
It is important that a certain technology is perceived as pleasant and thus accepted		-0.656

Note: EV: Eigenvalue >1; % of var: Percentage of variance (see Sarstedt et al., 2017).

Source: The authors' own research.

3.2. Regression analysis

The application of the regression analysis on the conceptual model (see figure no. 2) highlighted the fact that the three assumed relationships are confirmed. Therefore, Hypotheses 1 (H1) investigated the influence of safe technology in generating customer experience with Artificial Intelligence (AI) in retail. The results (β: 0.407; ***p<0.001) show that safe technology indeed led to customer experience with artificial intelligence, as the relationship is strong positive and of high significance, therefore H1 can be supported. The second hypothesis (H2) investigated the influence of ethical principles on customer experience with AI. The results (β: 0.136; ***p<0.001) confirm this supposing a strong and high positive influence, so the second hypothesis (H2) can be accepted. The third hypothesis (H3) assumes that customer-friendly technology influences customer experience with AI. In this case, the results (β: 0.284; ***p<0.001) show a good and strong significance of the impact, so H3 can be accepted.
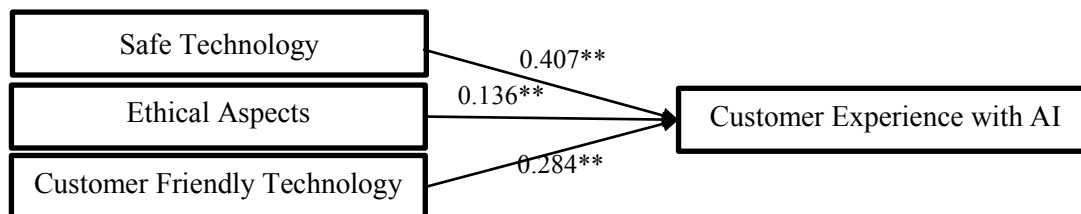
Note: **p<0.001.
Source: The authors' own research.

The literature (Domina, 2012) demonstrates that the pleasure of the new experience felt by the consumer when he is offered the possibility of purchasing from a virtual store, positively influenced intentions its purchase. Consumers who decide to buy from virtual stores are early adopters, being more likely to purchase from virtual stores or try latest products than their peers. Of course, they should be properly targeted, as they can become influencers and supporters in the virtual promotion of brands. Literature (Bourlakis et al., 2009) reveals that consumers often seek special experiences especially if they have the opportunity in engaging in virtual in-store shopping experiences. Retailers relying on virtual stores must consider different strategies aimed at increasing consumer enjoyment during in-store visits. Therefore, by using new sensory based online technologies (for instance virtual reality), customer enjoyment can be improved, and their experience can be enhanced (Pantano and Naccarato, 2010).

Retailers operate in highly competitive online environments, and virtual apps can be a great platform for building and expanding relationships with customers. The AI shopping experience can help them differentiate themselves from the competition and improve their image (Papagiannidis, 2013). Ethical concerns of Internet users continue to grow, but ethical perceptions may vary from case to case (Burns, 1994). Innovations based on artificial intelligence are set to help customers make the best decisions, not feel pressed for time and increase their confidence and satisfaction with the choices they make. However, they must be carried out on ethical principles. Retailers have no choice but to embrace emerging innovations to defend and/or enhance their competitiveness. The application of AI in retail must be ethically used in the context of retail, so as to help the customer to inform himself and always make the most appropriate decisions (Mahmoud, 2020).

Conclusion

The paper contributes to studies that approach the implementation of AI in the retail sphere, considering the observance of ethical principles. The research carried out reveals that the generation of AI experience in retail must be considered, as well as the extent to which the technology adopted is secure and customer friendly.

From a managerial perspective, retail decision makers may notice that, in addition to music or a pleasant smell, attracting and keeping the customer in the retail store also depends on the extent to which innovation and modern technology based on artificial intelligence can be used to create unique experiences and attractive to consumers. In the future, stores are recommended to review their business strategies and adopt different technologies from the field of artificial intelligence to facilitate the interaction of customers with the virtual environment. Managers must help develop strategies in favour of customers, not pressure customers to buy as much as possible, and ensure that customer data is used ethically. In this sense, customers' perceptions of safety and trust can be improved.

This study used a limited sample of respondents, most of whom belonging to Generation Z. Future studies could also focus on other consumer generations and/or intergenerational comparisons. A further limitation regards the fact that no actual shopping experiences were conducted, respondents only being asked to imagine a virtual shopping experience. Future studies should also consider different socio-demographic characteristics of respondents, such as their monthly income, their residence place, as well as their previous experience with virtual stores. A comparison between artificial intelligence based virtual stores of different retail chains could also be a future research perspective. It is desired to conduct a study to determine actual purchasing behaviour in virtual retail stores. We only examined a relatively homogeneous sample of users. Infusing a cultural element into a future study could reveal whether applied AI in retail is affected by differences in consumer culture.

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