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Article

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THE PROFOUND NATURE OF THE CONNECTION BETWEEN THE IMPACT OF USING ARTIFICIAL INTELLIGENCE IN RETAIL ON BUYING AND THE CONSUMERS' PERCEPTIONS OF ARTIFICIAL INTELLIGENCE ON THE PATH TO THE NEXT NORMAL

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Abstract

The purpose of this paper is to investigate the impact of the use of Artificial Intelligence in retail on buying and consumer behavior, better understanding how consumers perceive Artificial Intelligence on the path to the Next Normal. The consumer-technology partnership is confirming the reinvention of the retail organizations, retailers' advancement on this path involving acting on the new patterns and behaviors by considering the new technology adoption within the context of COVID-19. Based on a comprehensive literature review on the impact of Artificial Intelligence in retail a quantitative research design was employed to demonstrate the nature of linkage between this impact and consumers' perceptions of Artificial Intelligence. The data collection was performed through survey conducted in a supermarket chain in Romania, consumers' perceptions of Artificial Intelligence being considered a central metric for assessing the successful use of Artificial Intelligence-enabled interactions within the context of the offline-online convergence confirmed by the Store of the Future, and consumers' use of mobile phones in their Omni channel shopping journey. The present research, whose results were validated, offers retailers deep consumer insights with regard to the buying and consumer behavior change in Romania on the path to the Next Normal.

Keywords: artificial intelligence, retail, buying and consumer behaviour, consumers' perceptions of artificial intelligence, store of the future, next normal

JEL Classification: D12, L81, M31, O33

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Introduction

European Commission (2020) states “AI (Artificial Intelligence) is a collection of technologies that combine data, algorithms and computing power”. The Green Paper on Vertical Restraints in EC Competition Policy (1997) highlighted how increasingly blurred is becoming the distinction between manufacturing, wholesaling and retail sectors, consumers’ perceptions of retail organisations and store formats being central to the retailing business. The Green Paper on European Commerce (Ioan-Franc, 1998) presented commerce (wholesale and retail) as the touchpoint between citizens and their local community, while the electronic commerce (seen as being born global and driven by the Internet revolution) was presented by the European Initiative in Electronic Commerce (1997) as revolutionising the relationship between consumer and provider. Purcarea and Ioan-Franc (2000) found the powerful linkage between the business evolution in the digital era, the generational marketing and the NeWWW Consumer. As demonstrated by Purcarea and Purcarea (2008) Romania become an important market for the large distribution chains which were struggling to invest and differentiate by also combining offline and online sales. Purcarea, et al. (2018) highlighted the significance of Amazon’s Just Walk Out technology, which enables shoppers to enter a store, grab what they want, and just walk out, their credit card being charged for the items in their virtual cart (computer vision being a subfield of AI). Just Walk Out Shopping experience has been highlighted in 2018 as the world’s most advanced shopping technology (Weise, 2018). Dogtiev (2018) has demonstrated that one of the biggest industries in today’s world is the mobile app ecosystem, the app store being the major distribution channel for mobile apps. And as shown by MIT Technology Review Insights (2018), AI enables customer experience (CX) improvements to be made quickly and at scale. One of the biggest trends in the app development industry is AI, Google and Microsoft have upgraded, for instance, their translation apps with neural networks, releasing new AI-powered offline language translator apps for iOS and Android, while Speech Recognition Technology, Chatbots, Natural Language Technology, Machine Learning, Biometrics, Emotion Recognition, Image Recognition and Text Recognition are the main AI technologies used in mobile apps (Kanada, 2020). To make Omni channel shopping experiences more personal retailers can easily deploy tools like Customer experience platforms, Social listening tools, Chatbots, Account based marketing software (Delighted, 2020).

Over the last two years we have witnessed significant progress and achievements, such as:

- the announcement of a new Prime Air delivery hybrid drone on the occasion of the Amazon’s re:MARS 2019 AI & ML Conference (a new global AI event on Machine Learning, Automation, Robotics, and Space (Anderson, 2019);
- the increasing complexity of the consumer landscape, consumers’ behavior becoming driven by speed and convenience, their homes welcoming try-before-you-buy, and mobile, AR-based buying reaching a critical mass (Nielsen, 2019);
- the improvement of retailers’ efficiencies across their workflows thanks to AI, automation processes helping with both accurate data creation and providing context around shoppers’ needs and behaviours (Accenture, 2020);
- the relevance conferred by AI in the retail industry (Saker, 2020);

- shoppers' recognition and authentication – thanks to Capgemini's Digital EXperience Transforming Retail (DEXTR) – both via voice and facial recognition (Rajendran, 2020);
- the way in which digital become critical – to understand on the path to the Next Normal (considering critical areas of opportunity for leading in it: digital, transformation, organization, resilience, and sustainability) – being made more relevant by COVID-19 (McKinsey, 2020);
- the changing consumer dynamics (driven by technology adoption) in major areas (Nielsen, 2020).

This paper focuses on the nature of linkage between the impact of the use of AI in retail on buying and consumer behavior and consumers' perceptions of AI (these perceptions being considered a central metric for determining the successful use of AI-enabled interactions within the context of the offline-online convergence confirmed by the Store of the Future, and consumers' use of mobile phones in their Omni channel shopping journey), with the purpose of offering retailers deep consumer insights with regard to the buying and consumer behavior change in Romania on the path to the Next Normal.

Little research has been done on the nature of the above mentioned linkage, despite the great amount of space in between the information that has been revealed in the past and what retailers' decision-makers really need today within the context of the COVID-19 pandemic. Although some work has been done to date, more studies are needed to fill the current research gaps, including the need to ascertain the effect of consumers' misinformation regarding the benefits of AI-enabled interactions with retailers, and consumer anxiety (considering consumers' gap as the difference between their expectations and perceptions). Hence the imperative of both to build greater trust in retailers, and of a clear communication from them to consumers in terms of content focused on solutions based on AI to their problems, empathizing with their current pains – the emotional bond being essential, and highlighting how these solutions based on AI are making their life effortless, unworried and secured. Much uncertainty still exists about the nature of the above mentioned linkage, and as part of retailers' practice of continuous learning they are under constant pressure of redrafting their assumptions and understanding, being more sensitive to both the frequency, and extent of changes in information on consumers' perceptions. The more so what consumers say may not coincide with their intentions and actions, not revealing their values and emotions.

The results validated the structural research model and the associated hypotheses. The structure of this paper is as follows: introduction, scientific literature review, methodology, results and discussions, conclusions and references.

1. Review of the scientific literature

1.1. Store of the Future between connectivity and convergence

Earlier research by Purcarea (1994) found that the so-called Smart Store 2000 was a first research-and-development centre for concepts and technologies which (beyond different economic benefits) will make shopping more enjoyable and easier for consumers. Ristea, Ioan-Franc and Purcarea (2005) focused on major developments of the economy of the distributive trade. Ducrocq (2014) found that digital can allow stores to make the difference

with e-commerce (which is becoming a powerful accelerator of globalization), the technology making possible a new consumer relationship, intense and productive, also taking into account both that the economic equation of the store of tomorrow cannot be solved without resorting to digital tools, and that the complexity is a constituent of the retail of tomorrow. Purcarea (2015) approached the store of the future by identifying major developments with regard to the technological innovation, applications and success stories in retail (Figure no. 1), and presented at SHOP 2015 Conference, Expo Milano 2015 the foundation for the "Road Map for the Store of the Future" Project (Romanian contribution). There were underlined significant aspects with regard to the 21st century retail customer, best serving Omni channel shoppers, and being ready for the future store trends. Further research by Worldwide Business Research showed in its Future Stores 2019 Retail Technology Briefing that within the deepening of the so-called, in U.S., Retail Apocalypse major retailers are rethinking their core strategy assumptions. As suggested by Atmar, et al. (2020) retailers are under pressure of adequately defining the next normal and their competitive advantage, better understanding the impact of COVID-19 on their core consumer segments. According to Loeb (2020), many companies were impacted by the coronavirus pandemic (declaring bankruptcy or closing some stores and cutting back on new projects), confirming this way the above mentioned retail apocalypse (which began in 2010).

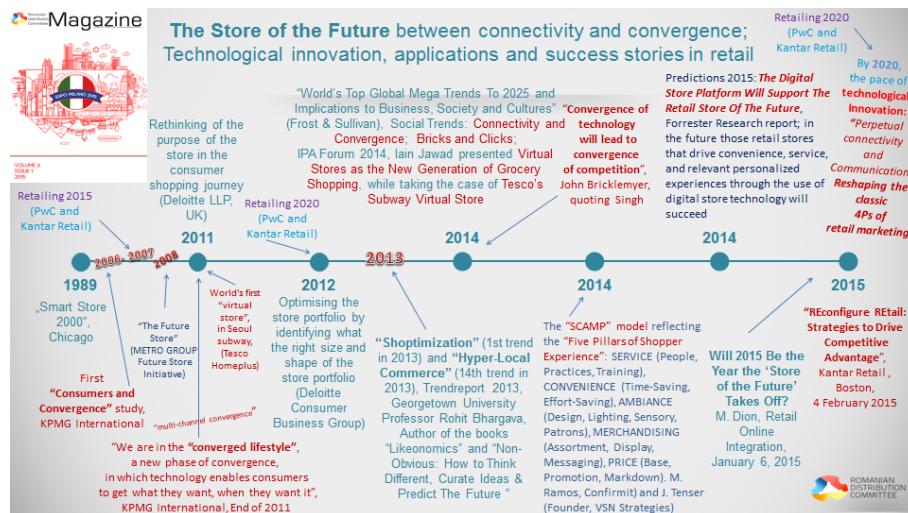


Figure no. 1. The Store of the Future between connectivity and convergence: Technological innovation, applications, and success stories in retail

Source: Purcarea, 2015, p. 37

Begley, et al. (2020) underlined retailers' need of building and maintaining their resiliency, rethinking their strategies and business models, considering the significant changes in consumer purchasing patterns and behaviors (such as e-commerce delivery, ordering through online apps, and contactless pickup), leveraging analytics so as to better understand and react to the evolutive shifts in consumer demand. In these unprecedented times retailers need to create consumer impact by acting on the new patterns and behaviors exhibited across all mediums (Twilio, 2020), and can can seize the opportunity of valorizing already well-known

empowered AI-based consumer use cases (DataRobot, 2020). Retailers need a clear understanding of their business strategy and consumers' buying behavior, so as to adequately define their consumer, confirming a better understanding of the differences between consumers, by tracking changes in their awareness (measuring awareness and knowledge), attitudes (measuring beliefs and intentions), and usage (as a measure of consumers' self-reported behavior, measuring purchase habits and loyalty, consumers' satisfaction providing a leading indicator of consumer purchase intentions and loyalty), distinguishing seasonality effects and noise (random movement) from signal, without forgetting, for instance, to consider consumers' willingness to recommend and to search, the estimation of the consumers' store visits using location-based tracking on mobile phones etc. (Bendle, et al. 2016).

Later research suggested that: consumers' perceptions (as response relationship) are the link between the brand inside the organization and the brand inside consumers (McEnally and de Chernatony, 1999); consumers' perceptions of choice alternatives are considered as necessary ingredients of economists' standard models (Anana and Nique, 2010); consumers use only a limited number of informational signals to form their perceptions (Bauer, Kotouc and Rudolph, 2012); consumers' probability to purchase is depending on perceptions of a brand (Seter, 2017). Consumers' perceptions are indissolubly linked to retailers' line that shows profit or loss in times of crisis, retailers needing to be observant to trends and act accordingly so as to build and maintain positive consumers' perceptions towards their brands (Keane, 2020). According to Gartner (2020), customer experience (CX) is defined as "the customer's perceptions and related feelings caused by the one-off and cumulative effect of interactions with a supplier's employees, systems, channels or products", while CX management (CEM or CXM) is seen as "the practice of designing and reacting to customer interactions to meet or exceed their expectations, leading to greater customer satisfaction, loyalty and advocacy". Also, according to Gartner (2019), the continuous intelligence needed for CX of the future will be provided by both human insights, and the speed and precision of AI technologies and analytics. On the other hand, retailers also really need to consider both the consumers' unspoken fears which often go unasked (MECLABS Institute, 2018), and a predictive model of the prospective consumer's decision process (Johnson, 2019).

In approaching the store of the future, it is imperative that retailers understand:

- To begin navigating to the next normal (which looks unlike any in the years preceding the current pandemic), by acting across five stages: Resolve (determining the scale, pace, and depth of business action), Resilience (going from cash management for liquidity and solvency to acting on broader resilience plans), Return (reassessing their entire business system and planning for contingent actions), Reimagination (considering the discontinuous shift in the preferences and expectations of individuals as citizens, as employees, and as consumers; reconsidering which costs are truly fixed versus variable; pushing the envelope of technology adoption), and Reform (learning from social innovations and experiments), paying attention to the imminent restructuring of the global economic order (Sneader and Singhal, 2020);
- Why CX is an imperative to adapt to the next normal (which is still taking shape, while customer expectations are continuing to shift in response) in retail. To recover faster from the pandemic retailers must quickly reimagine their omnichannel approach so as to create a distinctive CX, building more resilience in it, by taking initiative across five key actions: strengthening the commitment to the digital course of action, without frictions and ensuring that all digital channels are integrated and offer consistent services and experiences; injecting innovation into Omni channel (by bringing an in-store feel to the digital experience,

launching or diversifying delivery mechanisms, and partnering across retail to enhance convenience); transforming store operations and win on 'SafeX' (which means to provide safe(r) experiences so as to both alleviate consumers' anxieties and enable a return to in-person interactions); reimagining the physical network (by optimizing the footprint, redefining the role of physical stores, and creating the store of the future); embracing an agile operating model (Briedis, et al. 2020);

- "The new consumer", as the majority of global consumers have already changed their shopping habits (Charm et al., 2020);
- The overthrowing of the norms about retail, brand loyalty, and consumer behaviour because of the COVID-19 pandemic; the onboarding into e-commerce; the rethinking of the format of the store (making it much more comfortable and convenient for the consumer to visit); the taking into account who are the generations most likely to change brands or retailers (Gen Z cohort, as well as the higher-income cohort); the way of operating at multiple speeds while making difference between reacting and shaping (Brady, Gregg and Kim, 2020).

1.2. Artificial Intelligence (AI) in Retail 4.0: Omni-channel retailing

Marsden (2017) did provide a research roundup with regard to how people feel (their hopes, fears and meanings) about AI, pledging for a better understanding of these feelings if we are to use or promote AI successfully. McKinsey approached Retail 4.0 and underlined trends making clearly visible both the future role technology will assume in retail, and the need of new expertise which combines technology-, marketing- and merchandising-savvy (Desai, Potia and Salsberg, 2017). Capgemini Research Institute (2018) revealed its preoccupation with regard to a better understanding of how consumers perceive AI. Bughin, et al. (2018) also revealed new McKinsey Global Institute research findings (on the basis of a simulation of the impact of AI on the world economy, considering five broad categories of AI: computer vision, natural language, virtual assistants, robotic process automation, and advanced machine learning). Further research (Purcarea, 2019) shows how retailers are preparing for the impact of automation and AI technologies across all core functions, considering both the workforce implications, and the shopping tendencies defined by generational gaps within the reinvention of the shopper behavior by the digital revolution. According to IBM (2019), organizations need trusted data and trusted AI (the superior enterprise decisions and processes' optimization and automation being informed by such data coupled with advanced analytics and AI, including machine learning), organizations' expectations for what these data can do being reset by the interplay between people and AI (known as augmented intelligence). Considering the spirit and the littera of IBM recommendations, retailers also really need better learn:

- to master the quality of the data used, reducing algorithmic bias, providing the needed answers with evidence, and in order to have more intelligent interactions with their customers to utilize AI for sentiment analysis and predictive analytics, becoming their customers' trusted advisor as experience companies;
- to make harmonious to context the humanized experience with the help of AI, which reveal what makes human the moments in which customers are expressing their specific preferences, building more trust.

There is no doubt, as suggested by Ellis (2014) that the trending topic in data analytics is real-time analytics, which according to White (2020) have benefits like timely and accurate data, risk management (by revolutionizing the way systems can use data so as to predict outcomes and formulate contingency plans), and less downtime (by anticipating customers' needs and giving them the best possible CX on the basis of real-time data and predictive analytics). Further research (Swerdlow and Cyr, 2020) shows that data is becoming an essential part of CX, and the investments will focus on both gathering the data, and making sure that data is going to the right places. According to Business Wire (2020): consumers are helped both to find relevant information and perform tasks with actionable advice by Intelligent Virtual Assistants (IVAs), while in order to further enhance their customers' shopping experience retail stores implemented IVAs in their processes; there is a growing popularity among the consumers of such devices like chatbots (which are enabling ease of accessibility) and smart speakers (mainly Amazon Alexa and Google Home) for the variety of functions ensured. As shown by Market Research Future (2020), Proximity Marketing (using the cellular technology in order to connect with the mobile-device users who are in the proximity of a business, knowing the increasing dependency for accessing digital content) was considerably stimulated by the new coronavirus crisis, being estimated a significant growth in the upcoming period because of the rising use of the different types of proximity marketing technology (such as: mainly BLE Beacon, then Near Field Communication - NFC, GPS Geofencing, Wi-Fi etc.), retail being an important application area of this technology.

As suggested by IBM (2020): becoming digital is the start of a transformation (not only on the basis of both data and technologies extracting its full value and informing then intelligent workflows, but also of human-centric design for ever-better engagement of customers) into a so-called Cognitive Enterprise having capability layers build on each other in an integrated way, one of these capability layers (composed from: AI, Blockchain, Automation, IoT, 5G) being made possible with exponential technology; AI is helping to reimagine and reconfigure intelligent workflows, to personalize learning systems inside the organization, raising the customer, employee and ecosystem experience (while ensuring a continuum between them) thanks to an adequate human-technology partnership which is widely supporting continuous reinvention. Recent research (Fergusson, 2020) has found that considering the inevitability of the automation in large format store retail (leading to a better shopping experience) retailers are needing achieving the harmonious balance between shoppers and robots, being given significant examples of robots' use in retail, including with reference to the traditional competition between the giants Amazon and Walmart.

Recent Capgemini Research Institute research (2020) shows retailers' need to invest in emerging technologies (such as voice interfaces, facial recognition systems and computer vision) which are required by the obvious shift towards touchless customer interactions, considering critical success factors (such as incorporating feedback from consumers, securing employee buy-in, and leveraging data to iterate and improve CX, including by improving mobile-centric CX). Very recently, as suggested by Attar (2020), because of the rising demand for distribution space within the context of the boom of the e-commerce due to the pandemic, there is a clear interest of operators to drive further efficiencies with the help of various types of autonomous warehouse solutions, such as: autonomous (driverless) forklifts, autonomous inventory drones, and autonomous mobile robots.

And the last but not the least, it is worth also highlighting the recently released by Google, Android app so-called Lookout, which includes a supermarket product detection and

recognition model, allowing to run in real-time entirely on-device. This on-device system enables a spectrum of new in-store experiences (such as the display of detailed product information, customer ratings, product comparisons, smart shopping lists, price tracking etc.). (Chen, 2020)

1.3. The evolution of the retail market in Romania

Mortari (2015) highlights the crucial cognitive practice of reflection. As suggested by Purcarea and Ioan-Franc (2008) it is imperative to have a better understanding of the operationalization of knowledge transfer and of the competitiveness of the consumer goods distribution sector. According to Purcarea and Ratiu (2010) there is a real need of vision that orientates us towards a new future, considering both consumers' shifting needs, and stores' needs of being stocked with the right products at the right prices at the time consumers wants them, and also taking into account the continuous debate within the academic marketing community about the so-called critical marketing providing critical understanding of the marketing operations and mechanisms used by marketers for creating and supporting customer values, ensuring a retail environment which fits the particular needs of consumers. Retail Science from CBRE (2015) found that Romania ranks on the 22nd position globally out of 67 markets in terms of attractiveness and future plans of retailers for expansion, being necessary a deep understanding of consumer behaviour based on the coming together of information and analytics, the intersection of data and CX being at the heart of the retail environment.

A Romanian Competition Council (2018) report on e-commerce sector focused on marketing strategies (with regard to electro-IT products, the main product category sold in Romania, this category being followed by fashion and subsidiary articles) highlighted the increase in the level of receptivity and maturity of supply and demand and analysed including the impact of the Emag Marketplace (the only significant marketplace on the Romanian Market) on e-commerce sector. According to Paunescu (2020), Emag CEO underlined on the occasion of a webinar organized by GPeC in March 2020 that there were 20.625 active traders on Emag Marketplace. The above mentioned report of the Competition Council made reference to GPeC (eCommerce Prizes Gala), the most important e-commerce event in Romania. GPeC is organizing a well-known online shops competition.

A survey performed between April 6th-8th 2020 by Colliers Retail Division revealed (Colliers, 2020) how the COVID-19 pandemic affected retailers' activity and expectations in Romania, showing that 67% (mainly in the grocery, food & beverage, electronics, healthcare, and fashion segments) of respondents (which planned to support their business in the context of the COVID-19 crisis) focused on alternative sales channels (online commerce), while 60% of respondents (the majority being from fashion and food & beverage segments) expressed the belief that – due to both psychological medium term impact of the new coronavirus crisis on the consumers' appetite for shopping, and an expected contraction of their disposable income – the recovery of their business will happen next year, in 2021. As underlined by Roșca (2020) Kaufland (127 stores in 2019; it announced the opening of 13 stores in the current financial year) is now followed by Carrefour (371 stores), Lidl (260) etc. and despite the COVID-19 pandemic their investments will continue, the expansion champions continuing to be Profi and Mega Image (known as active small-format retailers, supermarkets

and proximity stores). According to USDA (2020) there was a dramatically shift of Romanian consumers in favor of online shopping beginning with the first Romanian COVID-19 case. And as shown by Cristea (2020) Penny Market, for instance, is adapting to the changes in consumer behavior by launching together with Auto Total the home delivery service Lyvra, which allows customers both to place orders online, and receive the products at home. According to Buhaescu (2020) even in the context of the COVID-19 pandemic more than half of the Romanian consumers (who participated at on LinkedIn applied Deloitte Romanian Consumer Trends questionnaire, between June 3- July 20, 2020) are still attracted by a combination of online and offline shopping channels, BOPIS offering them both the greatest safety, and convenience, while proximity is always a proper solution. It was also revealed that: there is a predominance of the socially conscious shoppers who supports local brands (55%) as being the most common profile, followed by the convenience seekers (33%, preferring to shop in their neighborhood), then by the so-called bargain hunters (7%), and stockpilers (6%, looking for storing a large supply for future use); retailers are challenged to embraced technology more quickly than planned, considering the above mentioned consumers' preferences, including that for buying local products. Deloitte Romania (2020) highlighted not only the strong impact on the local economy and urban mobility of the COVID-19 pandemic, but also its effect on a presumably acceleration of the offline-online convergence in retail (online shopping having a great potential). While a BOLD study by Profero&iSense Solutions (2020) showed that that regarding the integration of AI solutions 65% of consumers stated that they feel comfortable with online retail (the highest percentage for a field). And a Romanian Competition Council (2020) report on "The evolution of competition in key sectors - 2020" has mentioned, among other aspects, that the large commercial networks have highlighted the impact of medical and economic developments on their activity (costs, adaptation to new consumer behavior, changes in trade flows, etc.).

2. Research methodology

Consumers are more sensitive to the experiences they have in their lives right now during the COVID-19 pandemic. Their rational thinking (which is shaping their consumer and buying decision) is both preceded, and influenced by emotion, which is subsequently activating the resulting behavioural action. Retailers are more and more aware of their need to engage consumers by memorable, personal, and emotional experiences, making them valuing the time and energy spend with a retailer. The results delivered by retailers' digital transformation are depending on the digital consumer experience, essential to retailers' success being the value drivers. The way in which a consumer is feeling during a retail experience is expressed by his experiential value, which is now increasingly exceeding both the economic value, and the functional value. It is therefore necessary that retailers should be able: to identify which area is guiding the prevailing value for consumers when facing a purchase situation, going beyond the fragmenting data; to find out what consumers feel (even when they don't know themselves), making difference between how they think, what they think, and what they communicate about what they think or feel (by speaking, writing or in some other way), by exploring more fully the unconscious thoughts and emotions through blending of technology and psychology (Shaw, 2020).

Based on a comprehensive literature review of the impact of Artificial Intelligence in retail on buying and consumer behavior, a quantitative research was employed (using a structural equation model and an associated AI in Retail questionnaire) to demonstrate to the linkage

between this impact and consumers' perceptions of Artificial Intelligence. The research was based on six hypotheses, consumers' perceptions of AI (a single exogenous variable) being seen as the input construct (allowing the statement of the below hypothesis H1), considering our focus on questioning its impact on retailer's successful use of AI-enabled interactions with consumers, through the facilitating function of retailer's online-offline channel integration (a mediating variable allowing the statement of the below hypothesis H4). As shown in the figure no. 2 below, retailer's online-offline channel integration: depends on the retailer's alignment of Omni channel strategy to actions (an endogenous variable allowing the statements of the below hypotheses H2 and H3), the above last construct appearing as a moderating factor with regard to both retailer's online-offline channel integration, and retailer's successful use of AI-enabled interactions with consumers; impacts on retailer's successful use of AI-enabled interactions with consumers, being a mediating factor between the consumers' perceptions of AI (the input construct) and retailer's successful use of AI-enabled interactions with consumers.

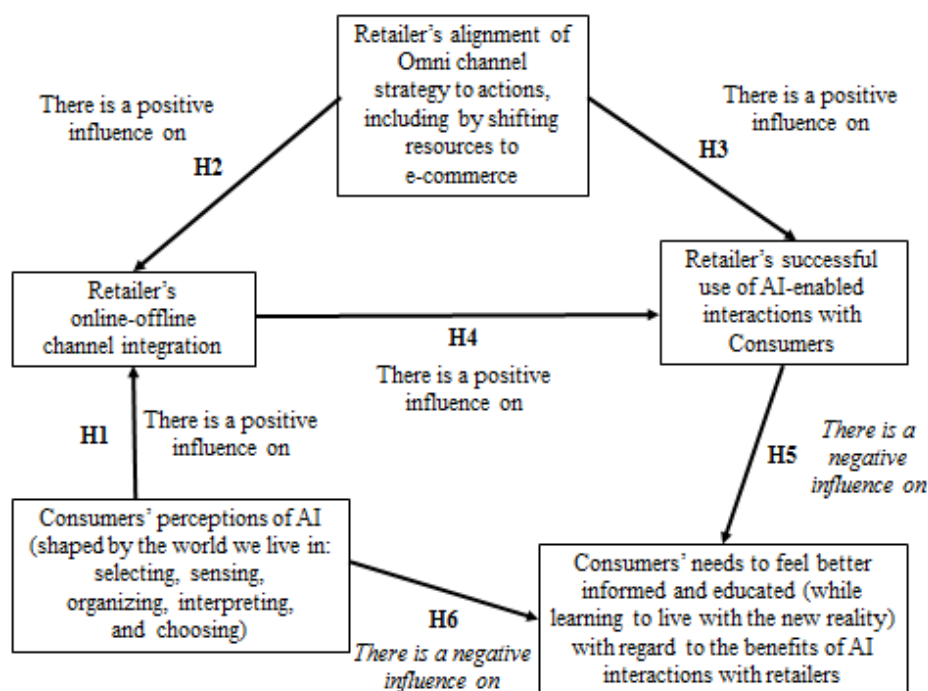


Figure no. 2. The theoretical research model

The theoretical research model designed on the basis of a consecrated quantitative model (Hair, et al. 2017) allows the exploration of the causal relationships between the above mentioned main identified constructs (to which was added a fifth construct in the risky perspective of a new wave of the new coronavirus crisis: Consumers' needs to feel better informed and educated, while learning to live with the new reality, with regard to the benefits of AI interactions with retailers), reflecting the following hypothesized influences shown by the SEM's path diagram: Hypothesis 1 (H1), Consumers' perceptions of AI has a positive

influence on retailer's online-offline channel integration; Hypothesis 2 (H2), Retailer's alignment of Omni channel strategy to actions has a positive influence on retailer's online-offline channel integration; Hypothesis 3 (H3), Retailer's alignment of Omni channel strategy to actions has a positive and significant influence on retailer's successful use of AI-enabled interactions with consumers; Hypothesis 4 (H4), Retailer's online-offline channel integration has a positive influence on retailer's successful use of AI-enabled interactions with consumers; Hypothesis 5 (H5), There is a negative influence of Retailer's successful use of AI-enabled interactions with consumers on Consumers' needs to feel better informed and educated with regard to the benefits of AI interactions with retailers, this negative influence being due to Consumers' anxiety (a mental cost depending on trust and clear content communication to Consumers) and friction (a physical cost depending on reducing the burdens on Consumers in doing something with regard to AI-enabled interactions and stimulating them to do it; Hypothesis 6 (H6), There is a negative influence of Consumers' perceptions of AI on Consumers' needs to feel better informed and educated with regard to the benefits of AI interactions with retailers, this negative influence being also due to Consumers' anxiety and friction, especially in the risky perspective of a new wave of the new coronavirus crisis.

The data collection in the quantitative study was performed through survey conducted in a supermarket chain in Romania from July 6, 2020 to August 19, 2020, based on the above-mentioned AI in Retail questionnaire consisting of a set of 39 questions answered by a sample of 1140 respondents (table no. 1), the average time spent to answer the questions being 7.30 minutes. As type of questions there were used closed questions: limited choice, multiple choice, checklist, partially closed. And as type of data sought (to be obtained from these closed questions) there were used factual, opinion, and behavioral questions.

Table no. 1. Sample Structure (research) – Romania

Romania	Younger than 18	18-25 years old	26-35 years old	36-45 years old	46-55 years old	56-65 years old	66 or older	Total
Male	13	164	133	152	59	31	4	556
Female	10	178	141	155	55	37	8	584
Total	23	342	274	307	114	68	12	1140

3. Results and discussions

To test the hypotheses in the proposed model, we used the questionnaire survey method. Later we used the Amos software package from IBM. We used a series of indicators to determine the validity of the model. We would like to mention: the non-normed fit index, also known as the Tucker-Lewis index - TLI, the Goodness of Fit Index - GFI, the adjusted goodness of fit index - AGFI, the coefficient of determination - CD, the comparative fit index - CFI, the standardized root mean square residual - SRMR, the weighted root mean square residual - WRMR. The 5 latent variables and related items are presented in the table below (table no. 2).

Table no. 2. The 5 latent variables and related items

Retailer's alignment of Omni channel strategy to actions A	A1	Did you receive marketing messages from retailers regardless of the channel used?
	A2	In general, do you find identical retailers' stocks (the variety and assortment levels of goods) on any channel you search?
	A3	In your interactions with retailers, have you noticed that your data, information about your business is concentrated under a single account, regardless of the channel through which you interacted?
	A4	Did you find identical prices for identical products on the channels you searched for?
	A5	Did you receive marketing messages on your mobile devices to influence purchasing being in close proximity to a retail store?
	A6	Do the retailers you are interested in use bricks-with-clicks technologies?
	A7	Do the retailers you are interested in offer services such as click-and-collect/BOPIS (in-store pickup of products purchased online) or online purchase of products while at a physical store?
	A8	Were you able to return online purchased products in classic locations?
	A9	Have you noticed more attentive staff or improved interaction software from retailers?
	A10	Have you been asked for personal data from retailers in order to create a profile for you?
	A11	Have you interacted with retargeting applications, personalized email marketing, social media marketing, cart abandonment emails?
Retailers' online offline channel integration I	I1	Do you already use or willing to use a mobile wallet to speed up payment and avoid carrying cash or cards?
	I2	Are you an active user of retailers' mobile applications?
	I3	Are you already using or willing to use BOPIS (buy online, pickup in store)?
	I4	Do you document yourself on several channels before making an „important” purchase (excluding purchases of strict necessity, daily) in physical stores or online?
	I5	Have you ever completed an online order outside the physical store's opening hours?
Retailers' successful use of AI-mediated interactions with consumers U	U1	Are you comfortable with using your mobile phone at different points (such as self-identification, product information, in-store navigation, self-checkout, and payments) in your in-store customer journey?
	U2	Do you think that will be an increase of the touchless interactions (through voice assistants, facial recognition, or apps) with retailers after the end of the new coronavirus crisis?
	U3	Are you already making or willing to make online purchases on the basis of personalized ads which use personal data?
	U4	Are you using or willing to use augmented and virtual reality to assess new goods and services?

Consumers' perceptions of AI (benefits from AI-enabled interactions with retailers) P	P1	Higher personalization
	P2	More trustworthy
	P3	Improved privacy and security of personal data
	P4	Reduction in effort from your end in your interaction with the retailer
	P5	Faster resolution of support issues (such as chatbots/virtual agents over)
	P6	24/7 availability
	P7	Greater control over the interactions
	P8	Other aspects
	P9	Human-like behaviour and personality
	P10	Ability to provide greater empathy
	P11	Ability to understand human emotions and respond
	P12	Human-like intellect
	P13	Human-like voice
	P14	Other human-like qualities (such as pleasant conversation)
Consumers' needs to feel better informed and educated with regard to the benefits of AI interactions with retailers N	N1	Are you anxious to minimize physical contact and maximize contactless when interacting with a retailer?
	N2	Do you have privacy concerns about potential data malpractices when retailers are enabling interactions via AI? Do you want to be made aware of it?
	N3	Do you want retailer to provide an "opt-out" (a choice between adopting different above mentioned technologies or traditional forms of interactions) so as to avoid being anxious?
	N4	Do you think the interaction with AI could lead to unpredictable, more spontaneous behavior from you?
	N5	Are you afraid to share your personal data in order to receive personalized content and offers?

A – The retailers' alignment of the Omni channel strategy to actions was evaluated on a Likert scale with 5 levels: Yes, Partially true, Neutral, Rather no and No. Survey participants answered questions A1-A11. Higher values reflect an advance in the implementation of the Omni channel strategy.

I – The integration of the retailers' offline and online channels was evaluated on a Likert scale with 5 levels: Yes, Sometimes, Rarely, Very rarely and No. Survey participants answered questions I1-I5. Higher values indicate more advanced integration.

U – Retailers' successful use of AI-enabled interactions with consumers were assessed by defining a 5-items variable, evaluated on a 5-level Likert scale: Yes, Partially True, Neutral, Rather No, and No. Survey participants answered questions U1-U4. The higher the values, the more successful the use of AI interactions are.

P – Consumers' perceptions regarding the benefits of AI-enabled interactions with retailers were assessed on a 5-level Likert scale: Yes, Sometimes, Rarely, Very Rarely and No. Survey

participants answered questions P1-P14. Higher values show a positive perception, while low values reflect a negative impact on consumers.

N – Consumers' needs to feel better informed and educated with regard to the benefits of AI interactions with retailers were assessed by defining a 5-items variable, evaluated on a 5-level Likert scale: Yes, Partially true, Neutral, Rather no and No. Survey participants answered questions N1-N5. Higher values indicate a high degree of misinformation and consumer anxiety.

Table no. 3 shows the mean and the standard deviation for the variables included in the study.

Table no. 3. The mean and the mean square deviation for the variables included in the study

		Mean	SD			Mean	SD
A	A1	3.663	1.145	P	P1	2.242	1.622
	A2	3.213	1.506		P2	2.344	1.665
	A3	3.896	1.357		P3	2.412	1.690
	A4	4.380	0.990		P4	2.378	1.678
	A5	2.741	1.475		P5	2.582	1.740
	A6	3.476	1.261		P6	3.670	1.657
	A7	3.699	1.365		P7	3.330	1.758
	A8	4.398	1.137		P8	1.324	0.633
	A9	3.887	1.429		P9	3.031	1.515
	A10	3.464	1.201		P10	3.056	1.514
	A11	3.777	1.097		P11	3.133	1.509
		Mean	SD		P12	3.260	1.491
I	I1	2.650	1.697		P13	3.447	1.534
	I2	4.604	0.835		P14	3.082	1.512
	I3	3.073	1.682				
	I4	3.809	1.305				
	I5	3.408	1.408				
		Mean	SD			Mean	SD
U	U1	3.985	1.362	N	N1	1.838	1.378
	U2	3.092	1.786		N2	3.119	1.785
	U3	2.786	1.776		N3	3.925	1.529
	U4	2.492	1.699		N4	2.582	1.740
					N5	2.786	1.776

Taking a brief look, we notice that the average score for the retailer's alignment of the Omni channel strategy to actions varies between 2,741 which refers to the use of techniques to influence the purchase, such as mobile technology to identify buyers in close proximity to a retail store, up to a maximum of 4,398 to allow the return of products purchased online in classic locations. Regarding the integration by the retailer of the online and offline channels, the average score varies between 2.65 for the intention of using a mobile wallet to speed up payment and to avoid carrying cash or cards and 4,604 for the degree of retailers' mobile applications usage. Regarding the retailer's use of AI-enabled interactions with consumers, the minimum score of 2,492 is recorded for the availability to use augmented and virtual reality to evaluate new goods and services, and the maximum score of 3,985 refers to the use of mobile phone at different points (such as self-identification, product information, in-store navigation, self-checkout, and payments) during in-store customer journey. The score of consumers' perceptions regarding AI varies between 1,324 for aspects that were not mentioned and 3,67 for the 24/7 availability of AI based online services. Consumers' needs to feel better informed and educated with regard to the benefits of AI interactions with retailers average scores between 1,838 on anxiousness to minimize physical contact and maximize contactless when interacting with a retailer, and 3,925 on providing an "opt-out" (a choice between adopting different above mentioned technologies or traditional forms of interactions) so as to avoid being anxious.

The reliability is estimated using the test proposed by Lee Cronbach in 1951 which measures the internal consistency of the items of a questionnaire, or rather the reliability of the test. It is the most used method to highlight the quality of measuring latent variables. Table no. 4 shows the scale reliability.

Table no. 4. Scale reliability

	Scale	α Cronbach	Number of Items
The retailers' alignment of the Omni channel strategy to actions	1-5	0.912	11
The integration of the retailers' online and offline channels	1-5	0.831	5
Retailers' successful use of AI-enabled interactions with consumers	1-5	0.698	4
Consumers' perceptions regarding the benefits of AI-enabled interactions with retailers	1-5	0.883	14
Consumers' needs to feel better informed and educated with regard to the benefits of AI interactions with retailers	1-5	0.735	5

The higher our score, the better the measure. A score above 0.9 (as we have for the retailers' alignment of the Omni channel strategy to actions) is considered excellent, a score between 0.8-0.9 (as we have for the integration of the retailers' online and offline channels and the Consumers' perceptions regarding the benefits of AI enabled interactions with retailers) is considered good, over 0.7 (as we have for the Consumers' needs to feel better informed and educated with regard to the benefits of AI interactions with retailers) is considered acceptable. Below 0.7 we have a poor consistency, however we can consider that the value for the Retailers' successful use of AI-mediated interactions with consumers is at the limit, and if we take into account the relatively small number of participants, we place this value in the

acceptable category. Trying to remove from the items, we fail to increase the value of the α Cronbach test, which is why we do not make any changes to the model. At the same time, a large number of items will increase the value of α Cronbach, while a small number can lead to low values. The increase in α Cronbach should be done by adding relevant questions. We keep this observation for future research.

The evaluation of the structural model confirms the initial hypotheses. Figure no. 3 presents the resulted structural model.

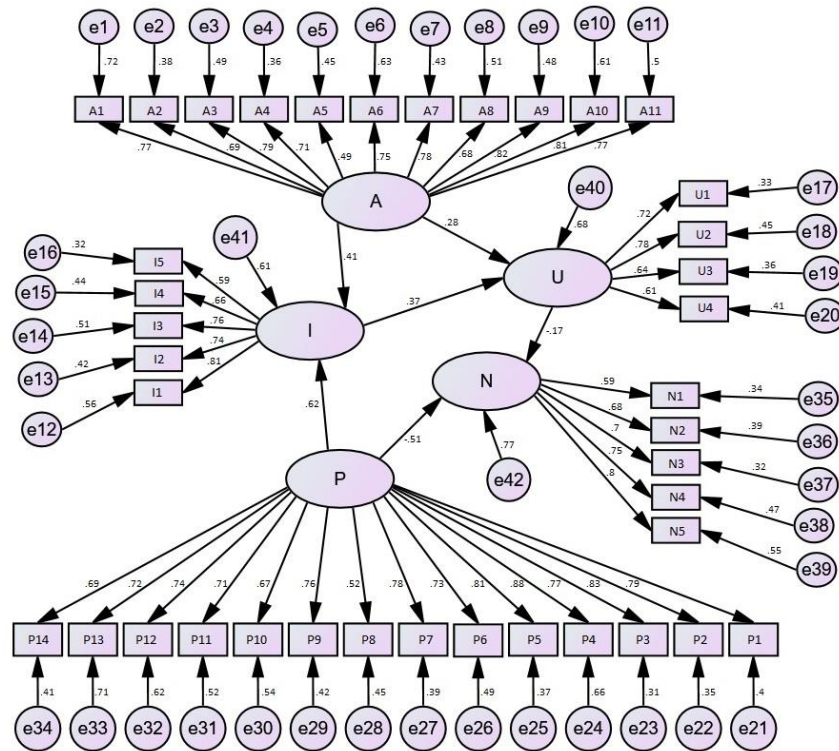


Figure no. 3. The structural model

Five of the six working hypotheses are validated, because the p-value is less than 5%. There is also a negative but weak relationship between the retailers' successful use of AI-mediated interactions with consumers and the Consumers' needs to feel better informed and educated with regard to the benefits of AI interactions with retailers. Also, the associated risk is approximately 11% (low evidence against the null hypothesis in favour of the alternative). The table below (table no. 5) shows the output also generated with the Amos software.

Table no. 5: SEM output

Hypothesis	Relation	β	p-value	Decision
H1	$I \leftarrow A$	0,414	0.000	Valid model
H2	$U \leftarrow A$	0,281	0.008	Valid model
H3	$U \leftarrow I$	0.369	0.000	Valid model
H4	$I \leftarrow P$	0.621	0.000	Valid model
H5	$N \leftarrow P$	-0.504	0.044	Valid model
H6	$N \leftarrow U$	-0.172	0.114	11% risk

Conclusions

The findings of the research are to some extent constrained by certain limitations, some of which provide opportunities for further research. We have a low representation of people over 46 years, their share being only 17% of the total number. This could also be explained by the fact that during the State of Alert period (July 6 - August 19, 2020), older people went less shopping, having a higher risk of getting infected with the new COVID-19 coronavirus, as well as having complications. Therefore, the final results should be seen with circumspection, as they are rather relevant for the 18-45 age segment (Xennials + Millennials + Gen Z). Furthermore, the reference period to which the closed questions were applied included holiday time which was strongly impacted by the COVID-19 pandemic (staying safe being a priority – fear of disease spread, of another disease outbreak, of unemployment etc. – and beyond financial issues or restrictions and border closures traveling to a destination being sometime a real challenge, including considering the changed way of celebrating different events or even the changed perception of time), consumers' perceptions when assessing something (by selecting, sensing, organizing, interpreting, and choosing) in their buying decision process influencing their behaviour (being necessary to better understand the fine border between what they need, want, prefer, expect, buy and feel this way, sometimes being very difficult under such above mentioned unprecedented circumstances). And retailers' emotionally engagement with consumers involves an obvious better understanding of consumers' perceptions, becoming consumers experts based on competency, adequate tools, and building trust.

The research developed a better understanding (needing to be continued) of the consumers' needs to feel better informed and educated (while learning to live with the new reality) with regard to the benefits of AI interactions with retailers (becoming more and more aware of: the role of AI in both predicting patterns, and changing the scalability of behavioral data analysis; the whole spectrum of benefits of AI for digital marketing), where mobile-based contactless transactions (such as retail store self-checkouts which use mobile apps) need to resonate more with consumers at the first attempt and a growing number of them are willing to use in-home devices or virtual assistance to purchased products.

Greater geographic reach, more supermarket chains for instance, may help understand certain differences which are important for the success of the future research, in the context of increasing touchless interactions (through voice assistants, facial recognition, or apps) with retailers after a presumably end of the new coronavirus crisis. We intend a calibration of the model, adding a series of questions for the latent variable N - Consumers' needs to feel better informed and educated with regard to the benefits of AI interactions with retailers. We will also try to complete the questionnaire so that the other age groups (especially Generation X and baby boomers) are fairly represented. We also plan to extend the research to other Eastern

European countries, while making a comparison of the habits and perceptions of people from different geographical areas.

The above-mentioned findings confirm both that the Romanian buying and consumer behavior is considerably changing on the path to the Next Normal, and that consumers' perceptions (as response relationship) of AI represent a central metric for determining the successful use of AI-enabled interactions within the context of the offline-online convergence strongly influencing Romanian consumers' Omni channel shopping journey. In the same time, there is clear evidence that the adoption by the Romanian consumers of the beneficial innovations driven by AI show an almost identical way to European and US consumers. Given these conditions, it is imperative for retailers' organizations acting on the Romanian market to take into account the above-mentioned practical insights and to adapt their offerings to the evolving buying and consumer habits (by continuously tracking changes in consumers' awareness, attitudes and usage), including by harmonizing their messages to the revealed new Romanian consumer mind-sets within the context of the fundamental shifts determined by the current unprecedented crisis.

This research provide an interesting and promising areas to work on the linkage between consumers' general anxiety within the context of the new coronavirus crisis (economic uncertainty, unemployment, financial insecurity) and the shifts in consumer behaviour and consumers' value perception (better experience, saving time and effort etc.; price; quality). And this based on the revealed findings (the need to ascertain the effect of consumers' misinformation regarding the benefits of AI-enabled interactions with retailers, and consumer anxiety, considering consumers' gap as the difference between their expectations and perceptions; the imperative of both to build greater trust in retailers, and of a clear communication from them to consumers in terms of content focused on solutions based on AI to their problems, empathizing with their current pains, these solutions based on AI making consumers' life effortless, unworried and secured).

From the point of view of managerial implications, the findings of this research mean in terms of retailers' actions accelerating to earn consumers' trust with trusted AI in order to capture their data, to use AI to maximize their shopping experience by removing their key pain points and ensuring them a more personalized experience, providing them with everything they need at the right time alongside the touchpoints and micromoments with the help of mobile apps, virtual conversational and voice assistants, robots, drones etc.

The perspective taken by this action-oriented research (based on inside knowledge but trying to obtain both insider and outsider knowledge, so as to maintain the appropriate detachment) allowed not only sensitivity and empathy, but also understanding of the matters, reflection, and the identification of the necessary change. The hypotheses developed in the quantitative study have derived from gaps in the literature, the research going beyond just collecting evidence to support the postulated hypotheses, trying to identify alternative explanations making more sense within the acceleration of the adoption of digital commerce and building trust and emotional connection, one hand, and the emphasis placed on both the prioritization of shopper safety, and the perception of what a good or service is worth to a consumer, on the other hand. And this including in order to avoid neglecting opportunities for future research. There is no doubt that on the path to the Next Normal, data science and the disruptives technologies like AI will reshape the retail landscape, retailers responding with agility and innovation in their omnichannel experience, better proceeding and strengthen

their ties to consumers by revolutionizing CX, store management, merchandising strategies, and offering them new value at a cost that they are able to pay.

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