10.2478/vjes-2024-0014

Digital Marketing and E-Commerce in AI Era

Ioan-Matei PURCĂREA
Romanian American University, Romania
matei.purcarea@rau.ro

Abstract

The main objective of this research is to analyze to what extent the e-commerce SMEs, by putting into action the knowledge capital, can leverage disruptive technologies like AI, including Gen AI. The secondary objective is to identify a solid foundation for the role of e-commerce E2E value chain in harmonizing technology and data so as to improve the customer experience (CX, based on a better understanding of the motivations of e-commerce business customers interested in adopting disruptive technologies like AI, including Gen AI), and increase the impact of an improved digital CX on e-commerce business profitability and sustainability. Research findings allowed the outline of perspectives by reducing the identified research gap, and to continue the traditional debate regarding the necessary improvement of the construction quality of a pyramid of solutions for valorization of disruptive technologies like AI by e-commerce SMEs.

Keywords: *AI, Gen AI, E-Commerce E2E Value Chain, Digital Marketing, Connected Consumer.*

JEL Classification: D83, L21, L81, M21, M31, M37, O31, O33

Introduction

After the challenging first months of the turbulent year 2020 we underlined the appropriate time to reflect on the well-known situation, and choosing to react and act in a purposeful and thoughtful way, to acknowledge the incomplete knowledge of our own knowledge's limits, consequently seizing opportunities and valorizing innovation [Purcarea a, 2020]. Let us remember that at the beginning of the last decade. Dalkir [2011] highlighted the complex activity involved by the knowledge management in today's knowledge economy being essential to have the ability to manage knowledge, continuously encouraging the development of organizational learning, and adding value through this valuable commodity or intellectual asset reuse and innovation. At the above-mentioned time of disruption, it became apparent the strong relationship between the novel economy and digital transformation (as a blending of process knowledge, intelligent automation, and data, both valuing and mastering data and content through disruptive technologies), and the need for taking into account evolutions in e-commerce, AI, and mobile technology in retail based on a clear picture of E2E value chain (Purcarea b, 2020).

Within this evolving context, it was an increasing pressure on retailers to improve new analytics technology usage, better understanding shoppers' digital behavior and removing friction from their experience, by considering the hybrid AI shopper journey and the stages on a valuable e-commerce maturity spectrum, as well as agile e-commerce, e-commerce contribution to sustainability in retail, the more personalized and immersive shopping, and the rapidly adoption of test-and-learn mentality regarding the Metaverse [Purcarea a, 2021; Purcarea b, 2021; Purcarea, 2022].

As we identified during our continuous practice [Purcărea a, 2024] a persistent gap (including from statistical reporting and official statistics point of view) regarding how our SMEs approach the e-commerce business from the point of view of disruptive technologies usage in the context of digital transformation and environmental, social, and governance (ESG) holistic framework, the main objective of this research was to analyze to what extent the e-commerce SMEs, by putting into action the knowledge capital, can leverage disruptive technologies like AI, including Gen AI. The secondary objective was to identify a solid foundation for the role of e-commerce E2E value chain in harmonizing technology and data so as to improve the customer experience (CX, based on a better understanding of the motivations of e-commerce business customers interested in adopting disruptive technologies like AI, including Gen AI), and increase the impact of an improved digital CX on e-commerce business profitability and sustainability.

The structure of this paper is as follows: Introduction, Literature review, Research methodology, Results and discussions, Conclusions, and References.

1. Literature Review

1.1. Knowledge and the Future Explanations' Digital Nature

Research findings by Ribeiro et al. [2022] revealed the fine linkage between knowledge management (knowledge creation, sharing and application) and Industry 4.0 implementation, considering a double perspective (hard technology-related, as well as soft people-related). They also focused on how worker engagement is impacted within this context by communication, culture and trust, paying attention including to all processes' critical knowledge.

David Deutsch's conception of knowledge (who showed how our knowledge will represent series containing infinite terms of approximations, that are being increasingly both powerful, and useful) has been presented by Boghossian [2021] as an asymptotic visualization confirming the at all times distinction (as totally predictable feature of human cognition) between the current state of knowledge and any future more completely enclosing explanation. And as an essential constituent of our human cognition (regarding the future explanations' digital nature) this existing distinction must be carefully considered, knowing that based on digital tools' usage our ability to understand the reality is asymptotic. And that because Deutsch left open the possibility of forcing a way through the digital / rational barrier with the help of new forms of knowledge.

We are continuously advancing on the path to create knowledge. Defined by Deutsch as "information with causal power", knowledge is in connection with two other terms, (raw and unstructured) data, and information (structured data), at the top of the hierarchy being, of course, knowledge [Nayeri, n.d.]. Knowledge creation (absence of both knowledge, and uncertainty being reduced by this creation) and innovation (competitive

advantage can be obtained by its basis) are quickened by knowledge exploration strategy [Bratianu, 2022]. Building a competitive advantage should be digital transformation's goal, this being happening by ensuring technology arrangement at scale so as not only to lower costs, but also to improve customer experience (CX), and AI transformation being an expression of digital transformation [McKinsey Digital, 2023]. On the other hand, as underlined by Salesforce [n.d.], understanding technology potential represents a key element of the above-mentioned digital transformation that – beyond the move from analog to digital (digitization) and digital data usage to simplify the way of doing work (digitalization) – is businesses' reimagination (not only of business processes, but also of culture, and CX) to meet new (changing) requirements of the business environment with the help of digital technologies.

The economic success is becoming increasingly dependent of knowledge within the innovation ecosystem, digital revolution being taken to the next level by artificial intelligence (AI), while economic growth (having productivity, capital, and labor as constituents) is reshaped by the disruptive technological change lead by digital transformation [Qureshi, 2020]. According to Zugravu et al. [2024], AI adoption in approaching economic development is involving leaders' awareness with regard to significant aspects (such as: right data security, talent attraction, public trust obtainment), and to support economic growth, as well as to attract investment and ensure workers' reskilling there is an increasing reliance on AI, especially within the context of the rising need of making data-driven decisions while ensuring timely data obtainment. On the other hand, as recently shown by Granskog et al. [2024], it is necessary to take into account that data center demand is driven by AI's rise, that also is impacting the power market dynamics' shift.

The total factor productivity and innovation outputs (both as mediating variables from process and outcomes' perspective) were selected by Zhao et al. [2024] in order to test digital transformation impact on firm performance through real-world observation. Their research findings showed that firm performance can be improved in a sufficiently important way by the digital transformation, this impact being more easily perceived on small and medium-sized enterprises (SMEs) than in bigger ones. In the retail industry, for instance, to further improve firm performance by controlling and making use of digital technologies on the way to its digital transformation it is necessary to make a critical appraisal of big data capabilities' impact on achieving economic, environmental, and social sustainability, as well on the project success and business continuity [Rummana et al., 2024]. Also, it is considered that fundamental to a data competent enterprise in context of its digital transformation is to have a highly experienced leadership in digital technology and dedicated profoundly in the digital transformation potential.

1.2. Deep Business Impacts of Gen AI as a Digital MarketingTransformational Technology. The Challenge to Build AI-Enabled Marketing Teams

As shown by Turner [2024], the latest Gartner Hype Cycle for Digital Marketing is dominated by key technology shifts (acceleration of AI adoption, additional obstacles added by privacy, and superapps' entrance impacting digital experience by making it cohesive and multiple customer interactions becoming easier) about to happen right now. He made reference to a statement of Gartner director analyst who highlighted the deep business impacts of Gen AI as a digital marketing transformational technology, martech future

continuing to be influenced by Gen AI rapid rising. According to Gartner Research [2023], one of the top three strategic priorities for successful chief marketing officers (CMOs) in 2024 is to build AI-enabled marketing teams (together with recasting marketing's value for an evolving enterprise, and orchestrating profitable growth across functions).

It is also important to better understand the relationship between human cognition, collective intelligence and AI-enabled interactions as perceived by customers, while carefully looking at the increasing large language models' impact on online knowledge communities [Purcărea b, 2024]. Marketers now face a real challenge to consider technological disruptions and ensure digital marketing performance improvement based on AI integration into marketing automation and maximizing companies' marketing capabilities while progressing with the ongoing journey into AI-driven marketing [Purcarea c, 2024]. And within this context of the new AI space race is imperative for marketers to pay attention to the paradigm shift in e-commerce (Purcarea, 2023).

Research findings by Algolia [Hall, 2024] revealed business leaders' interest in AI implementation for search capabilities in e-commerce, as well as in increasing what is at stake on plan merchandising, and improving personalization. Within this framework it was underlined the importance of creating a sense of shared knowledge for AI capabilities' advantages.

1.3. From Supply Chain 4.0 and Value Chain 4.0 to Digital Marketing as One of the Seven Primary Activities in the E-Commerce Value Chain

As recently highlighted by Cheng and Roy [2024], today's supply chains' safeguarding and restructuring are seen by some most relevant CEOs as requiring a more active approach to learning and problem-solving (in context of the current global events' negative consequences), for the next three years resilience being identified as one of their companies' growth key determinants. They expressed their belief that CEOs with supply chain management experience can obtain stronger firm performance by better facing supply chain (SC) disruptions (given to both early detection, and quick response), making more intense focus on SC matters, and having greater understanding of basic business operations.

Priorly, Cordon [2017] – as discussed at the Academic & Business Partnership 2017 SCM 4 ECR Conference organized by the Faculty of Economic Sciences, Valahia University of Târgovişte – in collaboration with The Consumer Goods Forum's E2E Value Chain & Standards Pillar, Paris [Romanian Distribution Committee, 2017] – focused on the fundamental change brought by technology at the confluence of Supply Chain 4.0 (by applying Industry 4.0 innovations) and Value Chain 4.0 (by generating and capturing value in the whole chain with the help of the new technology), showing the possibility to calculate (thanks to SCs' digitalization) sales and profits' increase as result of SC improvements. While Alicke, Rexhausen and Seyfert [2017] underlined the key enablers required by the transformation into a digital supply chain (a clear definition, new capabilities, and a supportive environment that includes the so-called incubator as the seed of SC 4.0).

Coming back to the present and the need of taking into account the e-commerce value chain components' optimization, let us made reference to Bridges [2024], who showed how critical are (to ensure both superior customer value delivery, and a competitive advantage maintenance) the strategic partnerships (with suppliers and logistics providers, as well as with technology partners) on the basis of not only intensifying SC transparency or ensuring order fulfillment streamlining, but also of in digital platforms and customer service

innovation driven. He presented a big picture (adapted by him from Harvard Professor Michael Porter's value chain) capturing the activities in a unified e-commerce value chain diagram, from which it appears that digital marketing (and advertising) is one of the seven primary activities (together with market research and consumer insights, product sourcing and procurement, website and mobile app development, order fulfilment and logistics, customer service and support, and data analytics and performance monitoring) in the e-commerce value chain. Also, he underlined, among other aspects, how the e-commerce sector was transformed by remarkable innovations like AI integration, including, for example, AI-driven chatbots usage and enhanced shopping experience based on ML algorithms, or drone delivery and AR usage in online shopping etc.

1.4. E-Commerce Early Adopters' Substantial Advantage and E-Commerce Revolutionized by Gen AI

Very recently [Allton, 2024], a strategic marketing leader in AI and data-driven solutions underlined leaders' and marketers' need to know how to control and make use of AI transformative potential and apply its tools effectively based on early investing in AI literacy, and gaining practical skills in AI-enhanced marketing, prompt engineering, and generative design. He gave an example with the lasting advantage gained by retailers known as e-commerce early adopters, which then already became giants in the first decade of this century.

According to Adobe 2024 Digital Trends report [Adobe, 2024], to take full advantage of AI, it is imperative for businesses to improve underlying data (relevant for the visual, but representing not displayed additional data), paying more attention to Gen AI strategy (content being Gen AI's first use case, and its E2E production progressing based on the skills built centered on AI), and establishing goals (aligned with enterprise-wide Gen AI) or key performance indicators (KPIs). This report also highlighted the substantial advantage gained by the early adopters of Gen AI solutions with regard to the delivered digital customer experience (compared to non-adopters), where businesses' need to accelerate their ability to valorize Gen AI.

Research findings by Future Commerce and Bloomreach [Shah, 2024] confirmed how consumers benefit of revolutionized shopping experiences (made more interactive and personalized) from your home amenities given increased e-commerce search capabilities made possible by GenAI and large language models (LLMs). For instance, they can benefit (beyond basic guidance) of hyper-targeted suggestions informed based on patterns identified with the help of AI (through in-depth analysis of not only demographics and browsing habits, but also of purchase history). This new report highlighted from the very beginning the importance of better understanding the AI adoption consumer segments, considering their beliefs with regard to preferences, and consequently providing tailored personalized experiences (desired by them, according to 78% of AI evangelists, 54% of AI acceptors, 48% of AI prospects, and 28% of AI rejectors).

The senior director – at "every day low price" giant phygital retailer Walmart – of e-commerce personalization (responsible for its in-house Content Decision Platform presentation) explained Gen AI usage to create their customers' custom-made piece of content, each user benefiting of a personalized homepage [Choudhary, 2024]. Both dynamic text, and dynamic images are cooperating in that specific task thanks to Gen AI.

As shown by Gartner Reviews [2024], specifically designed for ecommerce operations' needs Searchspring platform is recognized for ensuring both efficiency in product presentation, and relevancy, by streamlining the matching goods with shoppers' process (while offering services not only of search, but also of merchandising and personalization), which is considered an e-commerce key business challenge. A recent playbook by Searchspring [2024] focused on how generative discovery (powered by natural language processing – NLP, context awareness, dynamic result generation, and continuous learning) implementation is maximizing its impact based on valuable strategies. Customers can benefit on this basis of both personalized recommendations, and relevant content, quickly and easily finding this way the wanted products.

According to a recent report by The Brookings Institution, Washington, DC. [Kinder et al., 2024], after the impressive launch of ChatGPT 3.5 at the end of 2022, a lively debate was generated about the whole impact of the quick-moving Gen AI technologies on work and workers, as well on livelihoods, taking into account the variety of both "cognitive", and "nonroutine" tasks presumptive to be disrupted by Gen AI. Within this framework it was highlighted that Gen AI technologies' design and deployment are moving "far faster than our collective response to understand and shape them". And as if anticipating this above-mentioned diagnosis, McKinsey's representatives [Relyea et al., 2024] recommended immediate staged action and adaptation to the exponential rate of Gen-AI-related innovation, moving from experimentation to value capture. And from the point of view of what's possible with a marketing-based transformation (considering the advanced McKinsey's experience and research point to the above-mentioned staged action and adaptation to prepare for Gen AI's next inflection point), they gave examples of some already best practices in enabling (finally) the vision of true personalization at scale by valorizing Gen AI.

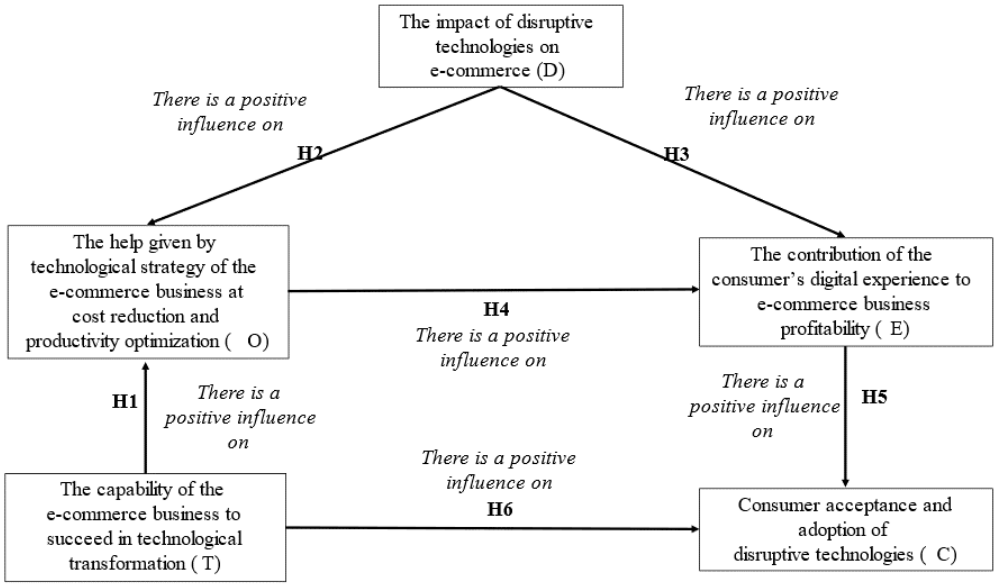
It is also worth underlining how Google (focused on real shopper pain points' solving) is already fast moving in this window of opportunity to ensure Gen AI incorporation into their customers' shopping experience, so as to make easier for (Google Search "Shopping Tab" or shopping.google.com) users to quickly find relevant products by providing AI-generated briefs [Pymnts, 2024]. Consequently, users' both online researching and shopping is intensifying (being also favored by the well-known transformation that valorizes – from Google's Shopping Graph and Gemini models – the impressive forty-five billion product listings).

2. Research methodology

Research hypotheses were developed by considering our practitioner experience mentioned earlier (including by involvement in national and international scientific events), the literature review (including the above-mentioned gap at the beginning and other gaps resulting from the literature), as well as our own prior work [Purcărea et al., 2021; Purcarea & Purcarea & Purcarea, 2021; Purcărea et al., 2022; Purcărea, 2024, ibid. - where it was specified that a series of results will be presented in the traditional Conference framework of October at UVT Târgoviște]. All of these were the basis of a quantitative research in which we resorted to a SEM model and an associated questionnaire (The impact of disruptive technologies on e-commerce), our research being based on 5 hypotheses and 5 variables (see Figure 1. below).

Figure 1.

The theoretical research model



(Source: Purcărea, I.M. (2024))

The research tool was valid and effective in measuring significant changes in the sustainable behavior of consumers in the well-defined group (*Customers from Romania, speakers of the Romanian language, who shop online in general stores*), as well as in terms of the adaptation of merchants who own online stores, while the sampling methodology was a random one, a combination of the systematic approach (every 5th customer) and the stratified approach (gender structures). Items were generated by combining inductive and deductive strategies, which involved literature review, previous own research, interviews with stakeholders (experts and customers), as well as focus group interviews conducted with entrepreneurs and people from management, with operators from businesses in Romania with online stores, but also with real customers of online stores. Participants were asked about the aforementioned themes and were asked to provide concrete examples from their daily activities, the aim was to evaluate the constructs' applicability and identify new directions that were not highlighted in the specialized literature. Following a rigorous process (an initial set of approximately 110 items, then an additional number of more than 40 items, bringing the total number to 150; approx. 60 items were eliminated by a first jury, reducing the total number to 90; a second jury was then formed for content validation and items selection, being removed another 41 items and modified 25), that left me with 49 items, each item being given a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), and all these steps helping to ensure that the items modified and retained for empirical analysis were clear, met the hypotheses, and were consistent.

The questionnaire survey method was used to test the hypotheses in the proposed model, next being used the Amos software package from IBM, while to establish model validity was used a series of indicators (such as the following: 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 root mean square residual – WRMR). Mean and standard deviation for the variables included in the study were presented in the Table 1 below.

Table 1.

Mean and standard deviation for the variables included in the study

		Media	**SD**
(T)	T1	3,880219	1,350301
	T2	2,984942	1,629284
	T3	3,747433	1,377859
	T4	3,962355	1,396897
	T5	3,947981	1,391276
	T6	4,086242	1,300983
	T7	3,887064	1,416721
	T8	3,001369	1,570707
	T9	3,991786	1,430947
	T10	3,807666	1,443207
	T11	4,118412	1,268835
	T12	3,530459	1,541636
	T13	4,056126	1,304208
(O)	O1	4,345654	1,137302
	O2	4,054757	1,411212
	O3	3,972621	1,491736
	O4	3,479808	1,669766
	O5	3,806297	1,616732
	O6	3,811088	1,587162
	O7	3,732375	1,676665
	O8	3,817248	1,461892
	O9	3,868583	1,416335
	O10	3,699521	1,52223
(D)	D1	3,080767	1,600186
	D2	2,776181	1,419968
	D3	3,793292	1,497846
	D4	3,597536	1,563573
	D5	3,794661	1,427806
	D6	3,80219	1,476258
	D7	3,788501	1,412189
	D8	3,791923	1,453089
	D9	3,540041	1,635419
(E)	E1	3,581109	1,714091
	E2	3,590691	1,622452
	E3	3,586585	1,688863
	E4	3,593429	1,660685
	E5	3,590007	1,680145
	E6	3,579055	1,611627
	E7	3,587269	1,676208

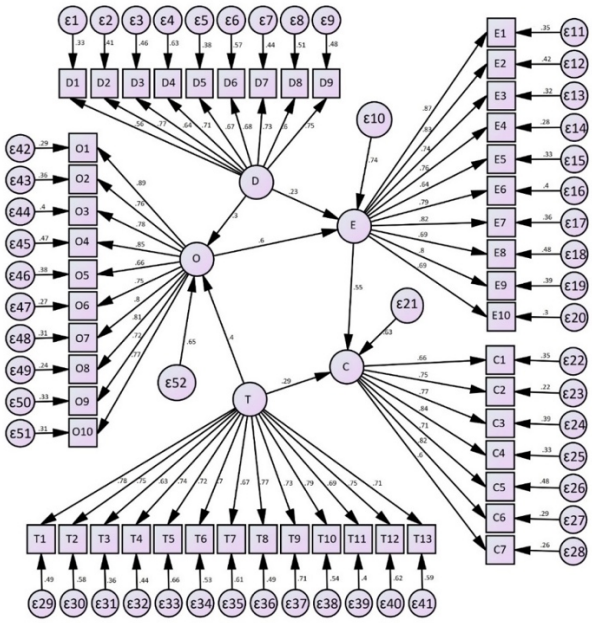
	E8	3,588638	1,635181
	E9	3,598905	1,609254
	E10	3,53525	1,583614
(C)	C1	3,090349	1,580288
	C2	3,345654	1,552824
	C3	2,765914	1,645655
	C4	2,980835	1,6284
	C5	3,086927	1,559759
	C6	2,561259	1,571529
	C7	3,036961	1,548752

(Source: Purcărea, I.M. (2024))

The reliability estimation (see Table 2. below) was carried out with the help of the test proposed by Lee Cronbach, the method allowing underlining the quality of the measurement of the latent variables. The initial hypotheses (the model generated being represented with the help of Amos software) were confirmed by the structural model evaluation (see Figure 2. below).

Figure 2.

The structural model



(Source: Purcărea, I.M. (2024))

Table 2.

The reliability estimation

	Scale	α Cronbach	No. Items
(T)	1-5	0.908	13
(O)	1-5	0.891	10

(D)	1-5	0.756	9
(E)	1-5	0.866	10
(C)	1-5	0.685	7

(Source: Purcărea, I.M. (2024))

Table 3.

SEM output

Hypothesis	Relationship	β	p-value	Decision
H1	O←T	0,396	0.011	Valid model
H2	O←D	0,302	0.000	Valid model
H3	E←D	0,232	0.136	Risk of 14%
H4	E←O	0,601	0.000	Valid model
H5	C←E	0,553	0.048	Valid model
H6	C←T	0,290	0.002	Valid model

(Source: Purcărea, I.M. (2024))

3. Results and discussions

A brief review of Table 1 allows us to observe that the average score for (T) varies between 2.985 which refers to the perception of the advantages of technological transformations of the e-commerce business, up to a maximum of 4.118 related to the assessment of the importance of access to loyalty programs and other incentives for frequent purchases. Regarding (O), the mean score varies between 3.4798 for risk aversion regarding the potentialities of implementing new technological solutions in e-commerce businesses and 4.346 for the appetite for shopping at an e-commerce store that uses technology to reduce costs and optimize productivity. As for (D), the minimum score of 2.776 is recorded for identifying the advantages of using augmented reality (AR) in e-commerce, with a view to a more informed purchase decision, and the maximum score of 3.802 refers to the attractiveness of the shopping experience as a result of the use of virtual reality (VR) in e-commerce. The score (E) shows the least variability among the responses received, with a minimum of 3.535 for appreciating reviews and ratings provided by other consumers on an e-commerce site and a maximum of 3.5989 for appreciating customer service provided by an e-commerce site in order to increase satisfaction with the shopping experience. And (C) presents the lowest average scores, with a minimum of 2.561 for appreciating products printed with 3D print technology and a maximum of only 3.346 for adopting the use of voice shopping assistants such as Amazon's Alexa or Google Assistant. We observe how 5 of the 6 working hypotheses are validated (as the p-value is less than 0.05%), and that the existence of the direct but weak link between the Impact of disruptive technologies on e-commerce (D) and the Contribution of the consumer's digital experience to e-commerce business profitability (E). As for the associated risk, it is approximately 14% (see also Table 3 below regarding SEM output).

With regard to the reliability estimation (the above-mentioned Table 2), the higher the score, the better the measure. Thus, a score above 0.9 (as we have for the Capability of the e-commerce business to succeed in technological transformation - T) is considered excellent, a score between 0.8-0.9 (as we have for the Help given by the technological strategy of the e-commerce business at cost reduction and productivity optimization - O and the Contribution of the consumer's digital experience to the e-commerce business profitability -

E) is considered good, above 0.7 (as we have for the Impact of disruptive technologies on e-commerce – D) is considered acceptable. A score below 0.7 means that we have a weak consistency, however we can consider that the value for Consumers acceptance and adoption of disruptive technologies (C) is on the limit, and if we also take into account the relatively small number of participants, we fit this value in the acceptable category. By trying to remove from the items, we fail to increase the value of Cronbach's α test, which is why we do not make any further changes to the model. We consider the test values to be satisfactory, considering that a too high value indicates redundant questions, while a low value may indicate an insufficient number of questions. At the same time, a large number of items will increase the value of Cronbach's α, while a small number may lead to low values. Increasing Cronbach's α should be done by adding relevant questions, and we reserve this observation for future research.

Then, we observe how 5 of the 6 working hypotheses are validated (as the p-value is less than 0.05%), and that the existence of the direct but weak link between the Impact of disruptive technologies on e-commerce (D) and the Contribution of the consumer's digital experience to e-commerce business profitability (E). As for the associated risk, it is approximately 14% (as shown in the above-mentioned Table 3 regarding SEM output).

These research findings allowed the outline of perspectives by reducing the research gap and improving the construction quality of a pyramid of solutions for valorization of disruptive technologies by e-commerce SMEs as part of a practical guide of e-commerce SMEs. Also, the results of the quantitative research: confirmed both the improvement of consumers' perception of the benefits of disruptive technologies, as well as their growing concern for the valorization of disruptive technologies by e-commerce business so as to ensure the continuous improvement of a personalized and seamless experience throughout their E2E shopping journey; allowed noticing some theoretical and managerial implications, as well as some limitations, which can be transformed into opportunities for future research. In the end, it resulted the need to continue linking to the knowledge base the collected information as a result of this quantitative research, for a more adequate coverage in our country of the professional practices of e-commerce SMEs. Of course, this research results are somewhat affected by limitations, which are mainly due to the impossibility of accessing, exploring and exploiting comparative data, as there is no methodological framework for measuring e-commerce (as we priorly suggested) and no public-private partnership in this sense. The non-existence of this framework does not stimulate the e-commerce business community to develop a unitary methodology that takes into account the progress made internationally. And even if an e-commerce business has reached that level of development that allows it to expand across borders, it cannot benefit from the advantages of the existence of such a methodological framework, and perhaps the situation has not been created to contribute to shaping the general framework. But beyond the existing reservations in the transmission of data in the case of some of the e-commerce operators, we hope that the ongoing efforts will transform these limitations into opportunities for further research.

Coming back to the above-mentioned practical guide of e-commerce SMEs, this was seen as helping to exploit the inventory of opportunities offered by the analysis of trends, considering ingredients for resilience and performance and targeting future modeling. This practical guide for valorization of disruptive technologies by e-commerce SMEs (the first of its kind approach, the international approaches being generally fragmented), includes a pyramid of solutions for valorization of disruptive technologies (P1-P6, see Figure 3 below), each solution representing, in turn, a combination of confirmed or emerging practices, the

phasing being able to be respected, adapted or even developed depending on the stage of the specific infrastructure and without using excessive resources.

Figure 3.

The pyramid of solutions for valorization of disruptive technologies by e-commerce SMEs

(Source: Purcărea, I.M. (2024))

It is useful to understand that the tools proposed in this framework are built on solutions that have worked for similar situations, matching the local setting with appropriate measures, as the case may be, according to available resources and specific context, in the assessment of each good practice proposed, the potential user of the guide should keep account of a series of attributes (detailed presentation in the thesis). That is why it is recommendable that the potential user takes a holistic approach to the constituent parts of the chosen practice as responding to a situation similar to his e-commerce business, investigating the set of factors and interactions that could contribute to the desired outcome. In designing the application of the respective practice, the balance between the various elements involved must be ensured (including at the level of mutual relations between the organization, available resources, innovation, ecosystem). And to the extent that the expected success is achieved through innovation and practical experience gained, the easiness or difficulty of expanding that practice (sharing the results obtained with other interested parties, as is the case for dissemination) must be analyzed based on the determinants of this success.

Conclusion

There is no doubt about the imperative of improving the local e-commerce SMEs' practice, investing in AI literacy and tools, building AI-enabled marketing teams and advancing on the path to revolutionize e-commerce including with the help of Gen AI. Our SMEs truly need a design thinking for their business through which to capitalize on disruptive technologies like AI in the context of the symbiotic relationship with these technologies, increasing interaction with customers and improving their experience based

on the creation and sharing of value, on the one hand, and on the other hand increasing productivity, resilience and agility, supporting change.

It is worth remembering how important is to continue the debate with regard to the pyramid of solutions for valorization of disruptive technologies by e-commerce SMEs (as we already do in the generous framework ensured by the Faculty of Economic Sciences, Valahia University of Târgoviște), so as to cover the lack of understanding of the functioning in the business environment at the confluence of digital transformation and ESG holistic framework, considering both the increasingly connected and savvy consumer, and the effect on e-commerce SMEs' profitability of improving the digital CX applying disruptive technological innovation and incorporating sustainability into the e-commerce business.

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