ISSN 2831 - 1434

Journal homepage: https://jem.fpm.ues.rs.ba/index.php/journal

Journal of Engineering and Management

Volume 2 / No 1 / March 2024 / 43 - 51

UDK 334.012.63/.64:339.138

DOI http://dx.doi.org./10.7251/JEM2402043U

Original Research Paper

Synergy between marketing strategies 4.0 and knowledge management processes in small and medium enterprises

Sinergija između marketing strategija 4.0 i procesa menadžmenta znanja u malim i srednjim preduzećima

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Abstract: *In an era marked by digital transformation, SMEs face the imperative of embracing Marketing Strategies 4.0 to remain competitive and sustainable. This paper, grounded in an extensive literature review, explores the profound impact of Marketing Strategies 4.0 on SMEs. Challenges encountered by SMEs in adopting Marketing Strategies 4.0 are discussed, including financial limitations and resistance to technological change. This scientific paper investigates the convergence of Marketing Strategies 4.0 and Knowledge Management Processes within the context of Small and Medium Enterprises (SMEs). In today's digital landscape, SMEs face unique challenges in harnessing the power of data-driven marketing while effectively managing their organizational knowledge. Marketing Strategies 4.0 are explored, shedding light on how SMEs can position themselves for continued success. In conclusion, this paper underscores the pivotal role of Marketing Strategies 4.0 in the SME landscape and offers guidance for SMEs to navigate the digital marketing terrain, drawing from the wealth of knowledge within the literature. As SMEs play a pivotal role in economic development, understanding the symbiotic relationship between modern marketing strategies and knowledge management is essential for sustainable growth in the 21st century.*

Keywords: *Strategies, Marketing, Synergy, Management, Knowledge.*

Apstrakt: *U eri obeleženoj digitalnom transformacijom, MSP se suočavaju sa imperativom prihvatanja marketinških strategija 4.0 kako bi ostala konkurentna i održiva. Ovaj rad, zasnovan na opsežnom pregledu literature, istražuje dubok uticaj Marketinških strategija 4.0 na MSP. Razmatraju se izazovi sa kojima se MSP susreću prilikom usvajanja Marketinških strategija 4.0, uključujući finansijska ograničenja i otpor tehnološkim promenama. Ovaj naučni rad istražuje konvergenciju marketinških strategija 4.0 i procesa upravljanja znanjem u kontekstu malih i srednjih preduzeća (MSP). U današnjem digitalnom okruženju, mala i srednja preduzeća se suočavaju sa jedinstvenim izazovima u iskorištavanju moći marketinga zasnovanog na podacima dok efikasno upravljaju svojim organizacionim znanjem. Marketinške strategije 4.0 se istražuju, ističući to kako MSP mogu da se pozicioniraju za nastavak uspeha. U zaključku, ovaj rad naglašava ključnu ulogu Marketinških strategija 4.0 u okruženju malih i srednjih preduzeća i nudi smernice za mala i srednja preduzeća za kretanje kroz teren digitalnog marketinga, crpeći iz bogatstva znanja u literaturi. Kako MSP igraju ključnu ulogu u ekonomskom razvoju, razumevanje simbiotske veze između savremenih marketinških strategija i upravljanja znanjem je od suštinskog značaja za održivi rast u 21. veku.*

Ključne riječi: *Strategije, Marketing, Sinergija, Menadžment, Znanje.*

1 INTRODUCTION

The advent of Industry 4.0 technologies has revolutionized conventional approaches across multiple fields of study. Knowledge Management Processes refer to systematic activities and strategies employed by organizations to capture, create, store, disseminate, and apply knowledge effectively, facilitating its use for

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decision-making, problem-solving, and innovation. Through digitalization, these technologies promote sustainability and usher in innovative infrastructures. In today's landscape, it is imperative for every organization to devise a unique marketing strategy to align with the evolving needs of customers and the market, encompassing both products and services. The perception of knowledge management (KM) practice has shifted away from being viewed as merely a supportive activity, as knowledge management processes (KMP) have become integral and inseparable components of critical business processes (BP).

In the current era of Industry 4.0 and the circular economy, businesses with morally sound and environmentally friendly practices are in high demand. Due to different operational and budgetary restrictions, small and medium-sized enterprises (SMEs) find it difficult to adopt Industry 4.0 technology. In the context of developing nations such as India particularly, the issue is more serious (Kumar, 2020). Companies need to enhance their marketing performance to not only thrive but also to outperform their competition. Enhancing an organization's productivity hinges on several critical factors: customer stratification, customer retention, customer profiling, and customer behavior analysis. In this context, Industry 4.0 technologies like the Internet of Things (IoT), cloud computing, artificial intelligence (AI)/machine learning (ML), big data, blockchain, robots, digital twin, and the metaverse assume pivotal roles. These technologies, as already evidenced in various domains, facilitate real-time monitoring, predictive analytics, intelligent insights, virtual representation, secure transactions, and the development of digital ecosystems.

The implementation of digitalization comprises sociotechnical processes at social and institutional level. Here, we discuss the few studies that present the importance of digitalization to sustainability. Digitalization of any field is driven by Industry 4.0 technologies (Bradley, 2007). Marketing Strategies 4.0 rely heavily on data analytics and customer insights. Effective knowledge management ensures that relevant internal knowledge and external market data are accessible, enabling SMEs to make data-driven marketing decisions, refine their target audience understanding, and tailor campaigns more precisely. Marketing's core activities are understanding customer needs, matching them to products and services, and persuading people to buy— capabilities that AI can dramatically enhance (Davenport, 2021).

As the digital realm melds seamlessly with the marketing domain, the significance of tailored strategies becomes apparent, bridging the gap between resource limitations and ambitious aspirations. We delve into the intricacies of these strategies, uncovering their potential to revolutionize SME marketing, bolstering their competitiveness in an ever-evolving marketplace. The integration of knowledge management with Marketing Strategies 4.0 encourages cross-functional collaboration within SMEs. Marketing teams can work closely with R&D, sales, and customer service departments to harness collective knowledge for more effective marketing campaigns and customer support.

As we progress, we unveil the arsenal of tools and technologies at the disposal of SMEs, empowering them to implement Marketing Strategies 4.0 with precision and efficacy. From marketing automation to customer relationship management systems, we decipher the technological enablers that pave the way for success. This paper endeavors to equip SMEs with the knowledge and guidance required to navigate the complex terrain of Marketing Strategies 4.0. Grounded in research and empirical evidence, it serves as a compass for SMEs seeking to not only survive but thrive in a digital age that demands nothing less than strategic excellence.

2 METHODOLOGY

2.1 The subject and the problem of research

Main focus on this paper will be on how marketing strategies 4.0 in small and medium enterprises synergize with knowledge management processes. This paper will also present how marketing strategies 4.0 in small and medium enterprises benefits them upon implementation.

2.2 Research goal

Goal of this paper is to present importance of synergy between marketing strategies 4.0 and

knowledge management processes in order to achieve goals.

2.3 Research question

Main question will be how to best implement marketing strategies 4.0 in order to achieve competitive edge through knowledge management. Following main research question we have 3 sub-questions.

First sub-question is how does implementation of IoT and cloud computing impact decision making in SME?

Second sub-question is how does Big Data and AI/ML help SME learn more about consumer behavior.

Third sub-question is how does implementing Blockchain and Digital Twin help SME with retention of customers.

2.4 Research method

This is a form of theoretical research in which conclusions are made by studying previous conducted researches. Research will consider different methodologies of other authors and analyze their results in order to make universal conclusions.

3 RESULTS AND DISCUSSION

3.1 How to best implement marketing strategies 4.0 in order to achieve competitive edge through knowledge management?

The term “Industry 4.0” refers to a broad spectrum of contemporary notions whose precise differentiation and clear classification within a discipline are not always attainable (Salah, 2022). Nonetheless, it can be perceived as a fusion of diverse technologies, including but not limited to IoT, cloud computing, big data, AI/ML, blockchain, digital twin, robots/drones, and the metaverse. Industry 4.0 has ushered in significant advancements across multiple sectors, spanning medicine, management, agriculture, military, construction, and beyond. This fourth-generation industrial revolution has left an indelible mark on the world.

As authors is (Ramesh, 2020) mention the central idea of Industry 4.0 is the trend of digitization, automation, and increased use of information and communications technology.

Some authors noticed that people’s lives and workplaces are radically changing as a result of the digital revolution, but the public is nevertheless hopeful about the prospects that Industry 4.0 may present for sustainability (Ganji, 2018). Things we must understand that these authors want us to understand is main objective and idea of Industry 4.0. As we understand there are three main pillars of it. First one would be digitalization, second one would be automation and last one would be increased use of information and communications technology (ICT). It is also important to stress what kind of impact does it have on lives and workplace.

They are heavily impacted by it. Individuals live and work is undergoing substantial changes due to the integration of digital technologies. We must pay attention to publics hopefulness for sustainability. Industry 4.0 may disrupt existing norms, it also holds promise for addressing environmental and societal challenges.

As we mentioned before there are quite a few things we must consider under marketing strategies 4.0. Now we are going to list things that we have done literature review about:

- internet of things (IoT)
- cloud computing
- AI
- big data
- blockchain
- digital twin
- metaverse

3.2 How does implementation of IoT and cloud computing impact decision making in SME?

Implementing the Internet of Things (IoT) in Small and Medium Enterprises (SMEs) can be a transformative process that enhances operational efficiency, customer service, and competitiveness. It’s main goal is to gather strategic information for customer satisfaction of targeted audiences. It allows

the connection of physical devices, resulting in information exchange that enables organizations to strategically become more efficient in the rising market dynamics, which has resulted in the creation of a long-lasting relationship with the customers (Roy, 2016). Building long lasting relationships is of utmost importance to SMEs, especially when we compare costs of retaining current customers to cost of acquiring new customers. It is in nature of any SME to strive to get new customers but main foundation is keeping current customers satisfied.

To build these long-lasting relationships, IoT technology is used to forecast the demands of customers by analyzing their purchase patterns through the data collected by the organization. IoT has brought about new opportunities and methods for how customers experience shopping. When customers interact with the IoT technology, it culminates in value co-creation, which greatly affects customers' continuance intention and word-of-mouth intention (Tsai, 2017). Many experts assert that word-of-mouth communication plays a pivotal role in influencing consumers' purchase choices. Additionally, within the realm of the shopping experience, mobile commerce has significantly benefited from the impact of the IoT.

IoT has made a lasting imprint in this domain by enabling the seamless integration of data, considering factors like time, location, and context, primarily through the utilization of location-based services. SMEs can leverage the data acquired through IoT to gain valuable insights into customer behavior and product usage patterns. Furthermore, this data can serve as a foundation for designing new products by providing insights into the existing landscape of internet-enabled products in the market and gathering feedback on customer preferences and opinions regarding these products. SMEs longevity can be achieved by enabling IoT devices in the products which are designed for the market.

Cloud computing is a technology employed by SMEs to centralize and integrate a shared pool of resources, resulting in more efficient management and scheduling. E-commerce, in particular, has experienced substantial growth and advancement thanks to the utilization of cloud computing. It is believed that cloud computing utilization (CCU) is beneficial in reducing the various marketing barriers that can be experienced by various SMEs.

It can also be used to reduce the international barriers which are encountered by EM-SMEs (Fan, 2015). Main goal of cloud computing in SMEs is to develop digital infrastructure for accessing essential data at any time and from any location and also be able to receive real time feedback on products and services.

3.3 How does Big Data and AI/ML help SME learn more about consumer behavior?

Constructing the right business case is often a critical determinant of a company's success in implementing AI. These solutions ultimately aim to streamline decision-making processes and improve communication as a result of information analysis (Rutkowski, 2020). From this we can conclude that implementation of artificial intelligence in a SMEs requires the precise establishment of business objectives, as well as access to data and appropriate tools, together with techniques for their analysis.

Main goal of implementing AI as part of creating new marketing strategies is developing artificial agents that analyze data regarding customers,focal companies and competitors in order to recommend marketing actions to achieve the best results.

Forecasting customers behavior is important because it helps creating marketing plans and adjusting future actions accordingly. AI and ML go hand in hand. ML as part of Industry 4.0 also greatly helps and improves creation of new marketing strategies. AI/ML finds application not only in the B2B sector but also in the B2C domain. Machines endowed with enhanced learning capabilities outperform those lacking such learning abilities, often even surpassing human capabilities.

Big data refers to vast and complex datasets that cannot be easily processed or analyzed using traditional data management tools and methods. Marketing in the contemporary world is largely dependent on big data. Big data is a disruptive technology that has proved to be helpful in decision-making, and may be applied to the various elements of the marketing mix such as

product, price, place, promotion, and people (Gandomi, 2015). Main goal of big data is to obtain concealed knowledge about consumer behavior. Using business analytics to strengthen the quality of a product or service. Identifying target customers and marketplaces to establish strategies. As marketing shifts from offline to online, there is a greater need to make strong marketing decisions, and one way to do so is by segmenting online customers. The data obtained from these customers is quite exhaustive and it needs advanced technologies such as big data for its analysis (Ducange, 2018).

3.4 How does implementing Blockchain and Digital Twin help SME with retention of customers?

Blockchain is a decentralized and distributed digital ledger technology that records transactions across multiple computers in a way that ensures the security, transparency, and immutability of the data. Blockchain is viewed as a tool that can revolutionize systems in a variety of industries. It is popular right now, due to its strong foundation (Tan, 2022). Blockchain technology holds the potential to be advantageous for SMEs in marketing, especially in areas such as supply chain management and internal control of marketing operations, enabling professionals to enhance internal management systems and marketing strategies, thereby fortifying the competitive edge of businesses. Goal that blockchain wants to reach is to improve consumer retention, SMEs have begun gathering and retaining customer data systematically, usually through loyalty programs. Consumers can transact directly without going through intermediary layers in unintermediated markets.

A digital twin is a virtual representation or digital replica of a physical object, system, or process, often used for simulation, monitoring, and analysis to improve efficiency, performance, and decision-making in real-world applications. SMEs can create digital twins of their products to simulate and test their designs virtually, reducing the need for physical prototypes, which can be costly and time-consuming. Digital twins generate a wealth of data that can be analyzed to gain insights into product performance, customer behavior, and market trends, helping SMEs make data-driven decisions. They can also can be employed to simulate market scenarios and test new products or strategies before launching them, reducing risks associated with market entry.

4 REVIEW RESULTS

4.1 Qualitive analysis

Knowledge management facilitates the creation, organization, and sharing of content within SMEs. This content can be used for content marketing, thought leadership, and demonstrating industry expertise, aligning with the content-centric nature of Marketing Strategies 4.0. SMEs need to adapt to changing market dynamics rapidly. Knowledge management processes enable the storage and dissemination of market intelligence, competitive analysis, and emerging trends, aiding SMEs in adjusting their marketing strategies promptly and innovating their products or services.

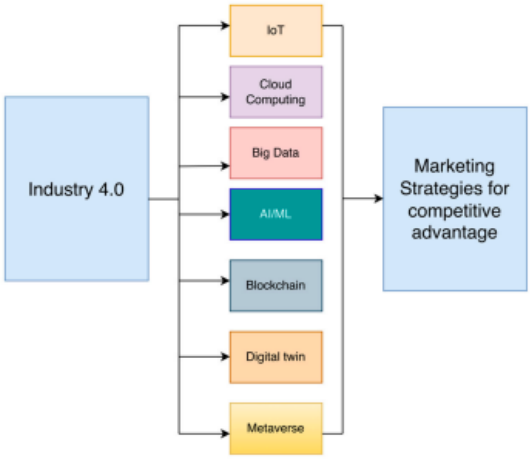

Figure 1. Technologies of Industry 4.0 that affect Marketing Strategies (Kaur, 2022).

Integrating AI, ML, IoT, blockchain, big data, the metaverse, and cloud computing into marketing strategies for SMEs can offer several compelling reasons and advantages:

- enhanced customer understanding: AI and ML these technologies can analyze customer data to identify patterns, preferences, and trends, allowing SMEs to tailor marketing efforts more effectively.
- personalization: AI and ML enable personalized marketing campaigns, product recommendations,

and content delivery, enhancing customer engagement and satisfaction.

- Efficient data handling: Big Data helps SMEs manage and extract valuable insights from large datasets, enabling data-driven decision-making for marketing strategies.
- real-time insights: IoT provides real-time data on customer behavior and product usage, allowing SMEs to make instant adjustments to marketing tactics.
- security and transparency: Blockchain ensures secure and transparent transactions, which can be particularly valuable in e-commerce and loyalty programs.
- cost efficiency: Cloud Computing: Reduces the need for extensive IT infrastructure investments, enabling SMEs to access scalable resources and solutions on a pay-as-you-go basis.
- innovation and competitive edge: Metaverse offers opportunities for immersive customer experiences, virtual showrooms, and innovative marketing campaigns that can set SMEs apart from competitors.
- supply chain optimization: IoT and Blockchain enable better supply chain visibility and traceability, helping SMEs ensure product quality and authenticity, which can be a valuable marketing point.
- data security and privacy: Blockchain provides enhanced data security and privacy, which is essential for building trust with customers in an era of increasing data concerns.
- improved customer engagement: Metaverse allows SMEs to engage with customers in new and immersive ways, such as virtual events or experiences, strengthening brand loyalty.
- predictive analytics: AI, ML, and Big Data enable SMEs to predict customer behavior, market trends, and inventory needs, optimizing marketing strategies and resource allocation.
- scalability: Cloud Computing offers the flexibility to scale marketing initiatives up or down as needed, accommodating growth or seasonal fluctuations.
- efficient resource allocation: AI and ML helps SMEs allocate marketing resources more efficiently by targeting the right audiences and channels.

While implementing advanced marketing strategies involving AI, ML, IoT, blockchain, big data, the metaverse, and cloud computing can offer significant benefits to SMEs, there are also potential drawbacks and challenges to consider:

- costs: high initial investment, implementing these technologies can be expensive, and SMEs may struggle with the initial upfront costs.
- complexity: technical complexity, these technologies often require technical expertise, which SMEs may lack or find challenging to acquire.
- data privacy and security: data risks, collecting and storing customer data can pose security and privacy risks, and SMEs may not have robust cybersecurity measures in place.
- integration challenges: compatibility issues, integrating various technologies may be challenging, and ensuring they work seamlessly together can be complex.
- resource constraints: lack of resources: SMEs may lack the financial and human resources needed for successful implementation and ongoing management.
- overreliance on technology :loss of personal touch, overreliance on technology can lead to a loss of the personal touch that SMEs are known for, potentially alienating customers.
- data overload: information overload, collecting extensive data can lead to information overload, making it difficult to extract meaningful insights.
- regulatory compliance: compliance challenges, SMEs must navigate complex regulations related to data privacy and consumer rights, which can be time-consuming and costly.
- resistance to change: employee resistance, employees may resist adopting new technologies, causing internal friction and hindering successful implementation.
- customer privacy concerns: privacy worries, customers may be concerned about how their

data is being used, potentially damaging trust and reputation.
- technical issues: downtime and glitches, technical issues, downtime, or system glitches can disrupt marketing efforts and customer experiences.
- limited expertise: skill shortage, finding and retaining employees with expertise in these technologies can be challenging, especially in competitive job markets.
- missinterpretation of data: misguided decision-making, misinterpreting data or relying too heavily on algorithms can lead to misguided marketing decisions.

The success of Marketing 4.0 initiatives hinges upon organizations' commitment to empowering their employees through ongoing education and training, enabling them to leverage the transformative potential of emerging technologies. In the era of Marketing 4.0, continuous education and training are paramount to equip professionals with the skills needed to navigate the evolving digital landscape, make informed decisions, and deliver personalized customer experiences

Knowledge-intensive organizations facing sustainability and social responsibility challenges should consider economic, social, and environmental goals (Dima, 2022). It can be achieved through synergy between marketing strategies 4.0 and knowledge management processes.

4.2 Developed model

Based on the thorough literature analysis a model for improving competitive edge for SME through synergy between marketing strategies 4.0 and knowledge management processes.

This model is generic in nature and is applicable in various small and medium enterprises. Based on the depicted model we can understand that small and medium enterprises can achieve competitive advantage through implementation of marketing strategies 4.0 and knowledge management. Synergy between those two almost guarantees competitive advantage.

By implementing AI and ML SME can significantly enhance their customer understanding. It helps them tailor their marketing strategy according to their consumers needs. AI and ML also have great role to play when it comes to personalization. Personalization is great way to achieve even deeper relation with consumers and deepen the bond between SME and consumer.

Big Data helps SME manage and extract valuable insights from large datasets, enabling better and more precise data-driven decision-making for marketing strategies.

Implementation of IoT as core part of marketing strategy 4.0 greatly helps SME with providing real time insight. It helps SME adjust to current market much faster.

Most SMEs don’t boast with almost unlimited resources that huge corporations have. Because of that they have to extremely smart when it comes to resource allocation. Implementing marketing strategies 4.0 and knowledge management helps them greatly. It provides them with platform to be much more efficient with their limited resources.

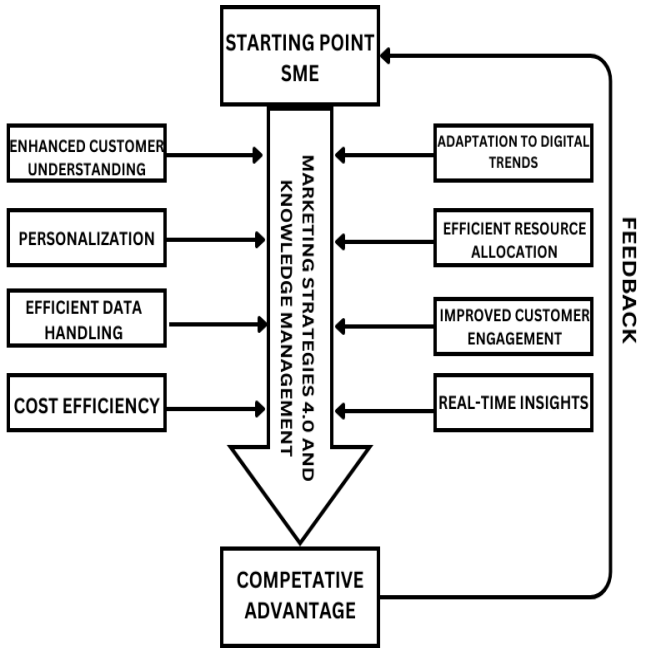

Figure 2. Model for improving competitive advantage through synergy between marketing strategies 4.0 and knowledge management

Improved customer engagement is one of the most important aspects of modern SME. They greatly value

each and every customer. As previously mentioned they have limited resources and it's much more valuable for them to retain current customers than to constantly search for new customers because they lost their current customers. Improved customer engagement has many benefits. It helps SME to grow organically.

Implementing these technologies can give SMEs a competitive edge by staying ahead of the curve in marketing innovation.

5 GUIDELINES AND RECOMMENDATIONS

Based on the research and analysis presented in this paper, the following guidelines and recommendations are offered for SMEs that want to base their marketing strategies on Industry 4.0 technologies:

- implementation of marketing strategies 4.0 can lead to many benefits such as efficient data handling, enhanced customer understanding and improved customer engagement just to name a few. They are all absolutely important for SMEs that want to be competitive in the market.
- although marketing strategies 4.0 come with many benefits, they must be implemented in certain way and require certain level on knowledge amongst employees in order to gain benefits from it.
- in order to properly implement marketing strategies 4.0 SMEs need to have certain level of resources in order to make most out of it. If given SME lacks resources or employees who lack knowledge these marketing strategies can't be implemented.
- in some cases implementation of these strategies can raise important questions about breaching data privacy and security or it can lead to data overload and even cause technical issues and glitches that can lead to disruption of marketing efforts.
- Marketing 4.0 often involves experimenting with new digital marketing channels and technologies. Knowledge management captures the lessons learned from these experiments, promoting continuous organizational learning and improvement in marketing strategies.

Efficient knowledge management reduces duplication of effort and the need to reinvent the wheel, which can lead to cost savings. In Marketing 4.0, optimizing resources is essential, and knowledge management helps SMEs achieve this by streamlining processes and knowledge sharing.

6 CONCLUSIONS

These technologies offer SMEs the power to unlock deeper customer insights, enhance personalization, optimize operations, and stay competitive in a dynamic marketplace. However, the journey towards harnessing these capabilities is not without its challenges, including costs, technical complexities, and data privacy concerns. Yet, the potential rewards far outweigh the risks. SMEs that embrace these technologies can elevate their customer engagement, adapt to evolving market trends, and make data-driven decisions that fuel innovation. As the digital landscape continues to evolve, SMEs must embrace the opportunities presented by Industry 4.0 technologies to not only survive but thrive in an increasingly digital world.

In this era of rapid change and heightened competition, SMEs must recognize that knowledge is not just an adjunct to business processes but a central driver of success. Effective knowledge management is a prerequisite for the effective implementation of data-centric marketing strategies. As SMEs strive for growth and resilience, integrating knowledge management into their core processes is no longer an option but a necessity. In conclusion, the fusion of these technologies with marketing strategies is not merely a choice; it is an imperative for SMEs aspiring to carve their niche in the digital age and secure their position as agile, innovative, and customer-centric enterprises. Effective employee education and training in the principles and practices of Marketing 4.0 are indispensable. While challenges and investments accompany the endeavor to educate employees, the rewards are manifold. Well-trained staff can unlock deeper customer insights, enhance personalization, optimize operations, and stay competitive in a dynamic marketplace. As the digital landscape continues to evolve, SMEs that prioritize employee education are better positioned to adapt, innovate, and succeed. The

symbiotic relationship between these elements holds the key to unlocking new horizons of growth, adaptability, and strategic innovation in the ever-evolving business landscape.

It is our hope that this research serves as a catalyst for further exploration and practical implementation, propelling SMEs toward sustained success in the age of Marketing Strategies 4.0.

Acknowledgment

This paper was supported by the Provincial Secretariat for Science and Technological Development, Autonomous Province of Vojvodina; Project number: 142-451-2706/2021; Project name: Analysis of entrepreneurial activity aspects in the context of society 5.0 - the possibility of implementation in AP Vojvodina; Project manager: PhD Sanja Stanisavljev, Associate professor.

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