sciendo

# Customer Relationship Management, Operational Digitization, Production Optimization and Value Creation through Artificial Intelligence in e-Marketing

**Timoné Silviu STĂNCIOIU**
*Aurel Vlaicu University of Arad, Faculty of Economics, Romania*

**Adina Eleonora SPÎNU**
*Aurel Vlaicu University of Arad, Faculty of Economics, Romania*

**Cristina Maria SANDA**
*Aurel Vlaicu University of Arad, Faculty of Economics, Romania*

**Grigorie SANDA**
*Aurel Vlaicu University of Arad, Faculty of Economics, Romania*

**Vanina Adoriana TRIFAN***
*Aurel Vlaicu University of Arad, Faculty of Economics, Romania*
**Corresponding author, vanina.trifan@uav.ro*

**Abstract.** *The implementation of information technology in enterprises develops customer relationship management, which has the role of improving customer satisfaction. By sharing certain information, it is also possible to maintain effective relationships with customers, but also to maximize profit. The use of social media platforms, in parallel with the implementation of information technology, strengthens the trust of customers, through the reviews of the end consumer. In this unique interview-based case study approach, we empirically describe a conceptual model. Production and distribution departments of operational flows, implement digital technology, becoming an artificial intelligence-optimized system. New intelligent manufacturing capabilities are transforming the relationship between the company and customers from one focused on product to one oriented towards creating value and services, even personalization of them.*

**Keywords:** Digital implementation, Customer Relationship Management, value selling, artificial intelligence.

## Introduction

Over the past two decades, customer relationship management (CRM) has been recognized as an organization's integrated strategy to perform in customer relationships in order to provide efficient service. The existing literature has described the implementation mechanisms and the role of CRM capabilities in creating a competitive position for an organization (Battor & Battor, 2010). In addition, there is much discussion about the CRM capabilities enabled by artificial intelligence (AI) in many management disciplines (Dwivedi et al., 2021). Companies develop integrated CRM systems with AI to accurately manage complex relationships and analyze customer requirements (Delloitte, 2020). The specialized literature confirms the need to analyze large volumes of data (customer orders) through digital technology. It offers optimization services to certain operational departments by leveraging the efficiency of digital technology. Typically, product providers (in our case, manufacturing and

DOI: 10.2478/picbe-2023-0103
© 2023 T. S. Stăncioiu; A. E. Spînu; C. M. Sanda; G. Sanda; V. A. Trifan, published by Sciendo.
This work is licensed under the Creative Commons Attribution 4.0 License.

distribution), adopt a digital strategy to differentiate themselves from competitors and create new, intelligent operational flows and establish closer collaboration with customers.

Also, the implementation of digital technology is doomed to failure if a transition from the classic product delivery model to an innovative one is not also carried out. Digitization transforms the manufacturing firm into a smart firm that delivers value and solutions for its customers. Let's take a common example: the order placed by a customer after a certain time previously established. Digitization offers access to its stocks to the customer, thus providing a service. The lack of product in stock creates customer dissatisfaction. The firm can come up with a solution by selecting the desired product, where the artificial intelligence system can confirm the input into the production workflow, and thus the firm comes up with a solution for the customer. The internal digitization of operational departments, combined with the creation of new values and services, become customer solutions that transform the relationship between the company and the customer, becoming the essential key to a new strategy. Existing product-centric ones are being transformed into customer service and value, thus changing CRM. The company's responsibility increases with the implementation of information technology. When the customer accesses a software platform, an integrated part of the business, it becomes part of the business, thus easing the transition from transactional interaction to relational interaction. However, the process of creating long-term mutual relationships is not always easy, as it is unknown territory for the firm.



Various specialists confirm imbalances in the relational transition, such as risk, or how to find the appropriate level of personalization (some clients want total personalization). The firm wants total transparency for all its clients, to share as much data as possible, which integrates it into their internal digital system. The co-opting of customers, but also their acceptance to contribute to the design and continuous improvement of value creation and services, are the first necessary steps for the efficiency of digitization. The sharing of information, as well as their mutual analysis, transforms the classic business model into a new business. The two partners, the firm, and the customers, grow each other's businesses by providing mutual services (customer feedback). At the same time, the CRM strategy, in our case, develops a relationship with end consumers, by accessing social media platforms, to create a strategic balance. Digitization focused on certain internal procedures brings internal advantages regarding the operational optimization of certain departments. It creates internal value without creating customer value. CRMs that implement AI are systems that also include post-sales services, which actually means creating the external value of the company and selling it.

## Literature review

The use of digital technologies enables different types of servitization and service innovation. Digitization has actually spurred firms to move from product-centric models to service-oriented digital offerings, and also digital transformation is changing the customer's demand for value. It changes the way a company creates and captures value, as digitization mainly involves the provision of services. Opportunities for new services grow as firms synchronize digitization, connectivity, and data analytics. The creation of an ecosystem in the B2B concept has undergone important changes in the last decade, related to the development of new technologies and the automation of processes. One of the most relevant changes has been the implementation of techniques and software that use AI to increase the optimization and efficiency of intelligent processes or systems, customized for each business. Until now, CRMs have been widely used to organize processes, to execute logistics orders, to obtain information about products and services. The constant use of social media in interactions with customers and suppliers has led companies to

focus on implementing AI-based CRMs in digital marketing (Zhang et al., 2020). New business challenges are driven by connected ecosystems, where data analysis is crucial to CRM strategies, where AI plays an important role (Saura, 2021). The importance of implementation, as well as the proper use of CRM, is vital to business success as data-driven decision-making processes are increasingly common. The processing of data resulting from the digital marketing strategies that companies carry out drives the use of AI tools and added to conventional CRMs, makes it possible to extract information. This leads to the creation of knowledge that companies can use to improve their digital customer relationship performance (Pineiro-Chousa et al., 2021). Adding elements that work with AI to automate prediction processes, customer behavioral forecasts, using data analysis algorithms, strengthen the system, becoming more performant.

On these considerations, CRM must be understood as a strategic concept, and not as a technological one. CRMs become operational optimization applications regarding customer satisfaction, the goal being to achieve solid and loyal relationships. The specialized literature identifies the three fundamental pillars that characterize CRMs: technology, processes, and human resources. Processes must be implemented as structural changes, oriented towards faster satisfaction of customer needs. HR strategies must be focused on engaging employees so that they understand what their new duties are. Increasing data storage capacities, as a result of large amounts of data from customers, forces the CRM to acquire new functionalities, focused on managing the interaction process between the company and its customers. Therefore, at this time, technology and the use of new innovations, allow CRMs to evolve to acquire different types of management and functionality.

## Methodology

The research methodology used is based on the interview technique. The interviews were conducted by the research team in January 2023. The interviewees are: the general manager and the designated staff, in the management of the distribution, production and financial-accounting departments. The analyzed company operates in the field of food industry. Starting from the review of the research literature within the research, we looked for answers to problems such as: 1) briefly describe industry, company and experience; 2) describe the main processes of production; 3) describe the concept of the model; 4) why do you focus on optimizing production? 5) What difficulties do you encounter when using these technologies? 6) What users will benefit from the services of implementing the conceptual model ? 7) Why are these technologies needed? 8) through these technologies, with which customers do you want to interact mainly? 9) What is the common point in the strategy chosen by the management of the company, in the application of the two concepts?. Before starting to collect the necessary information for this study, participants were informed about its purpose, and their participation was completely voluntary. Participants did not receive any benefit for their participation in our study.

The analyzed company has a portfolio of 149 clients with legal personality, 6 own specialized stores and is present in the distribution area, in a chain of supermarkets. Hierarchical levels of command are few, this being on two levels, facilitating the transmission of information to the 34 employed staff, who are distributed among the supply, financial-accounting, production, management, and distribution departments. The activity profile is in the field of the food industry, the segment of the production of bakery products, the establishment of the company sold as of the year 1991, and the activity begins in 1992. We note that the operation of the company is continuous for 32 years, accumulating the experience of economic transformations. We note that the distribution department includes the specific activities of delivery, sales and marketing.

## Results and discussions

In the first stage, the implementation of information technology, carried out by a specialized company, aimed to optimize the operational flow of production, by centralizing orders, in real time. The second stage is the co-opting of customers into the new information system, and it was considered a difficult stage in completing the implementation of this new concept. Providing customers with information on product stocks, assortment, order confirmation and the possibility of their customization, is done with the help of communication channels, obtained through the digital platform customized to the specific needs of the company. The sharing of information from own stores (for example: visualization of the structure of the products sold) with the final consumer customers (CCF) (for example: customization of orders), is part of the strategy applied by the management of the company, to gain the trust of customers with legal personality (CPJ). The integration process is arguably one of the most important processes in CRM because it takes the outputs of the applied strategy and translates them into value-added activities (service creation). At the same time, the use of business-to-business (B2B) and business-to-consumer (B2C) concepts, in the marketing strategy, are used for a more focused sharing for customers, but also to reduce the risk of excessive personalization.



What is the common point in the strategy chosen by the management of the company, in the application of the two concepts? We ask the question because of the differences between B2B and B2C. The models differ in at least two respects. From a B2B perspective, an aggressive push strategy is applied, using means such as sales force (price discounts) to get CPJ to buy, promote and sell the firm's products, at CCF. Instead, B2C applies a strategy to attract CPJ, through advertising and other forms of communication to convince CCF to buy products from CPJ. From the perspective of business and product classification, B2B refers more to the sale of industrial products based on materials and parts, capital goods, goods and business services, while the B2C model refers more to the sale of consumer products. Furthermore, in the B2C model, the target market is composed of CCF, whose needs are identified and satisfied by the firm through its own stores.

In the B2B model, the market is small and concentrated with few CPJ customers, easy to identify and access. Given the differences in the number and accessibility of customers between the two models, the interaction between organizations in the B2B model is longer and more complex than that between the firm and consumers in the B2C model (Fleming et al., 2016). Firms operating under B2B invest large sums of money in maintaining relationships so that they can identify CPJ's changing needs and provide fast and tailored solutions. But at the same time, CPJ's main priority is to identify suppliers that meet their changing requirements, which is difficult to predict in the long term.

In B2C, consumers are confused about the added value of a product due to lack of experience in evaluating different types of products, when packaging or product features change significantly. After establishing a set of standards for each model, he develops a customer experience for that model. CRM information refers to the collection and use of customer data, to generate new customers in perspective, but also provides appropriate marketing responses, regarding the creation of the strategic common area. In addition, B2C firms typically face higher communication costs given their large number of consumers (Bell et al., 2017).

The combination of these concepts identifies the chosen strategy, by pooling B2B and B2C resources, optimizing costs and determining a common area of action. Balancing the two concepts, strategically using social media communication channels, increases confidence in the new type of

business proposed by the company. This is justified due to the increasing trend in the importance of using digital technology (Seley & Holloway, 2008).

The common equilibrium area is the moment when the company, through the digital platform, offers its customers the same services; one side of the platform is the CCF end user, and the other side is the CPJ merchant, who develops a cooperative relationship through the application and offers customers various services and common functions (figure 1). For example: a customer accesses the company's services through its own stores; place a custom order outside of their market area; the firm makes the service available to the CPJ client in that area, thus developing value-creating relationships, which is sold satisfying the needs of all parties involved. It reduces the resources invested by participants in finding each other and carrying out the interaction. It also improves interaction efficiency by reducing costs. Cost value is a compromise between the benefits perceived by users and the financial cost of the platform. When the perceived benefits exceed the financial cost, the platform provides value to the user (Wang et al., 2019).



There are a growing number of channels through which the firm can interact with its customers, by telephone, including traditional telephone, radio, software interface, including email, and mobile terminal services. Channels are used to maximize the exposure of the assortment, which is just a click away. However, integrated channel management relies on the ability to support the same standards for both CCF and CPJ. (For example, accessing CPJ customers in real time, video, about the activities in their own specialized stores, but also after-sales services through CCF's request for customized products).

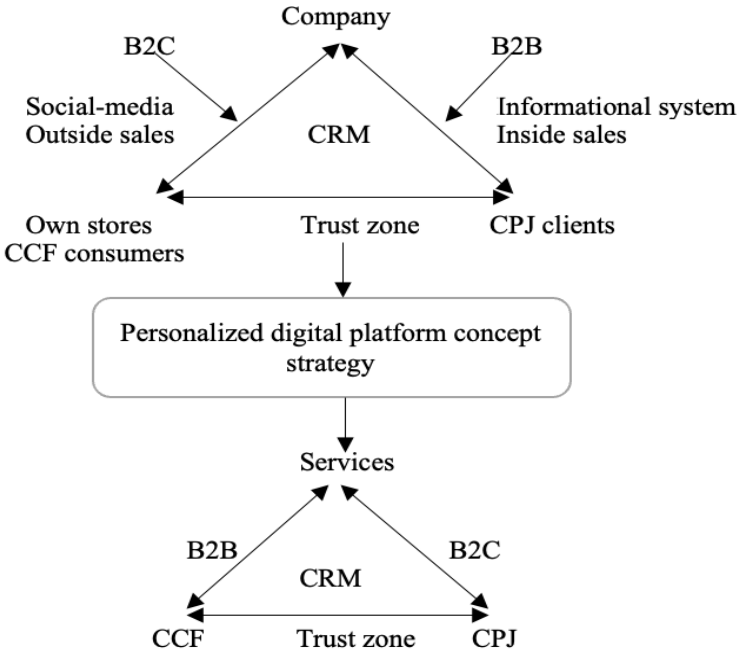



**Figure 1. CRM balance creation**

Source: Authors' own research.

The management elements of CRM are the data warehouse, which provides a corporate memory of customers through IT systems, which include the organization's hardware, computer software, analytics, and front office and back-office applications. They support the many activities

involved in interfacing directly with customers and managing internal operations, regarding operational production flow, customer financial benefits and supply planning to reduce costs. The data warehouse provides a strong organizational memory, becoming a data store, integrated at the company level, capable of relevant data analysis. There are two forms of data warehouse, conventional data warehouse and operational data warehouse. The latter stores only the information necessary to provide a single identity for all customers. Loss of identity is a disadvantage for CRM, but it is an advantage in creating internal value through operational optimization. A custom data model is used to handle this data conversion, generating a process to minimize data duplication and resolve any inconsistencies between databases. The literature shows that using a CRM within sales teams is necessary to increase sales performance. At the same time, the use of own stores, to benefit from a direct communication with the final consumer, bring considerable benefits in the process of co-opting customers, in the new type of business. The use of social media networks to present external sales (through own stores) to customers is an IT solution. Thus, the company also becomes a provider of after-sales services, with customers becoming users and beneficiaries of the services. Social media also helps small and medium businesses in their sales process and the use of social media in sales has positive results in customer satisfaction (Agnihotri et al., 2020).



Architecture is an important aspect of a platform and allows users to benefit from its advantages through modularity, connectivity, and interface standards. Digital platform architecture refers to a set of digital platform components generally described as interaction areas, the data area, and the IT system. For example, the platform has the interaction area where customers can use different functions (real-time stocks), the data area that stores the data for these interactions, and the IT system that defines the infrastructure for data storage and interactions. The design of the platform in a modular system (figure 2) and the premise of the co-opting of customers in the new type of business, foreshadows the meaning of the design, starting from the customers and their orders. The detection of critical points reveals the characteristic of the platform, becoming systems that include operational AI, for the optimization of production. The essential feature in the detection of critical points include the particularities of the business. The company, in our case, produces goods in which the validity period is 48 hours.

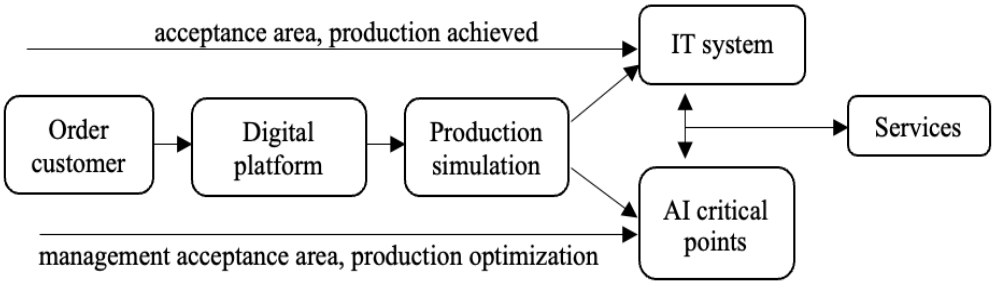



**Figure 2. Modular process of architecture**

Source: Authors' own research

The acceptance order acceptance area is based on the construction of the historical database, in the IT system, and optimizes the production system by accepting the tasks, in the time governed by the operational procedures. Overcoming the operational governance involved using AI in the production maximization system. Combining existing management with the transformation of production capacities, in after-sales services, creates a value offered to the customer (for example: offering advantageous prices, to cover production capacities), thus reconfiguring the company's

internal resources. This fact leads to a facilitation of value creation. Basically, the company makes a service available to them, where they can choose the most advantageous options.

Building the historical database helps predict critical points, thereby integrating AI into operational governance. Sectioning the modules between production simulation, IT system and AI critical points (figure 3), concept development is developed.



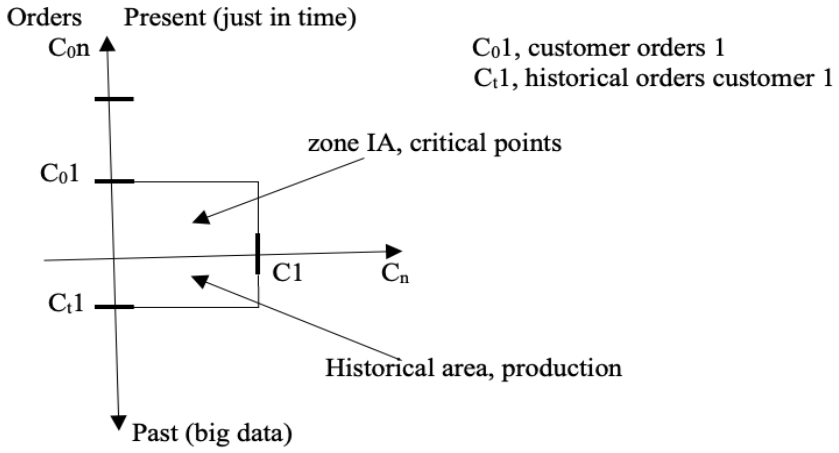



**Figure 3. Area of operational governance**

Source: Authors' own research.

For example: we have customers, who place orders on products. The algorithm designed for the company's needs is presented in Figure 4. Their centralization for the operational flow, where we can distinguish the areas where customers no longer represent importance (vertical axis) and the customer identification area (horizontal axis). Computer system refers to the computer hardware and related software used in the business. The digital platform is created in the strategic concept chosen by the company. Technology integration was done before the databases were integrated into a data warehouse and access is provided throughout the company based on the needs of each department.

The ability of the firm to expand into the existing system to plan for integration without disrupting business operations is essential. Analytical tools, which enable efficient use of the historical data warehouse, can be found in specific software application packages. More specific software packages include analytical tools that focus on tasks such as analysis of company management, customer balances, receivables, etc. Front office applications are the firm's technologies used to support all those activities that involve direct interface with customers, including CRM.

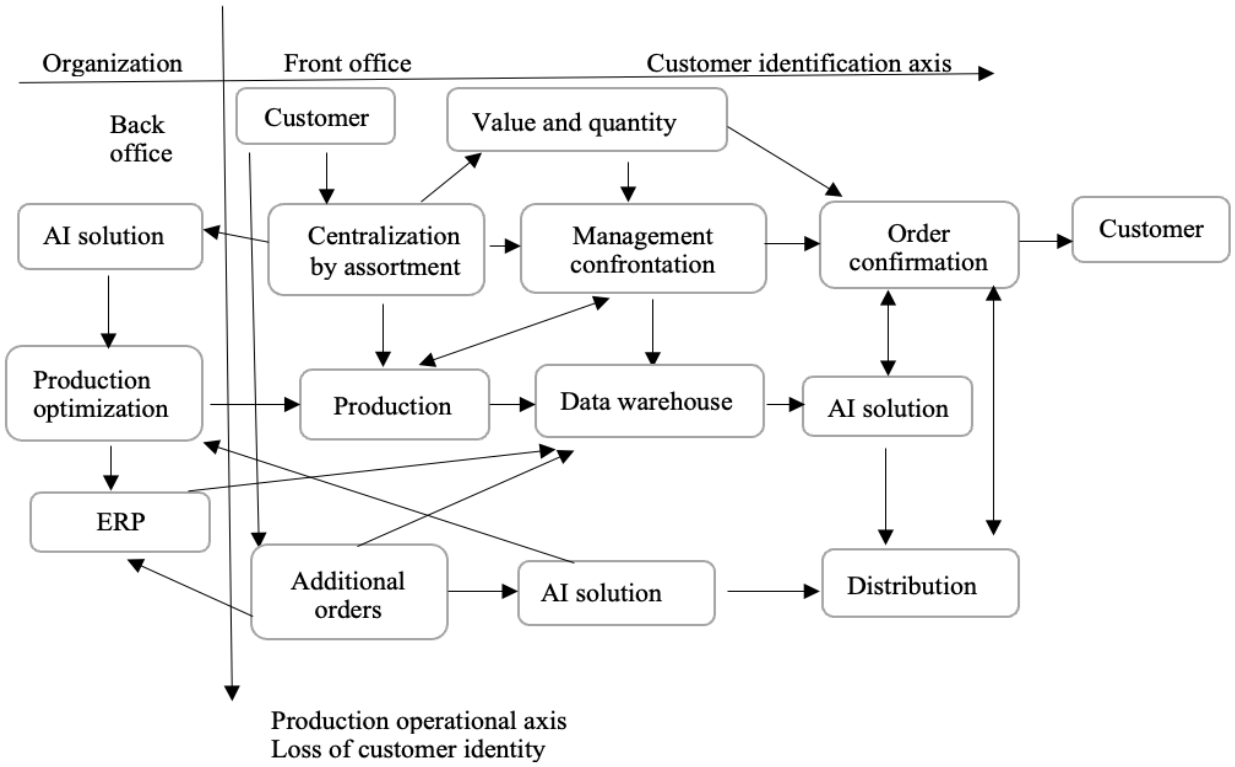



**Figure 4. Representation of the IT system algorithm**

Source: Authors' own research.

Back-office applications support the internal administration of activities and supplier relationships, including human resources, procurement, management, software logistics and some financial processes. A key concern about the front and back-office systems provided by CRM is that the firm is sufficiently connected and coordinated to improve customer relations. CRM service providers and consultants provide implementation support through change management, organizational design, training, and human resources for business transformation. The specialized literature also highlights the construction of infrastructure and integration systems, through the outsourcing of the infrastructure and, more specifically, the outsourcing of some business processes (cloud services, electronic invoicing). However, despite the claim to find a "full solution CRM", few software vendors can offer the full range of functionality that a CRM business strategy demands. That's why on-site customization is necessary, to learn more details about the managerial needs in running the business. The information planning process provides a means to share relevant customer and other information throughout the business of the firm.

The platform development perspective also assumes that IT information technology is considered both as an operant resource and as an operant resource. As an operand resource, IT can be used to search, transport and pool resources for value creation. Firms can search and act on IT for resource combinations. For example, physical resources in a transportation logistics system can be digitized as data so that users can plan and recombine them for their own logistics needs. As an operational resource, IT can seek and pursue unique opportunities to integrate resources on its own

in this value creation process. For example, a logistics system can automatically make recommendations to users about how to combine different logistics resources based on their plans.

The platform has applied various AI technologies to digitize its production process. For example, based on machine learning, an algorithm was developed (shown in Figure 4, which can help a customer automatically select the right products. Also, a coupon was developed that helps CPJ automatically set different values (price offers, depending on quantity). In addition, a recommendation system was developed on different products for CCF customers. Based on machine learning, it generated production optimization. In the case of distribution of own products, machine learning in the logistics system automatically identifies the most suitable delivery order, depending on CPJ value and cost reduction.



The implementation of the system is proceeding with difficulty, exceeding the forecasted time. Training staff, explaining the new type of business to customers, and co-opting them was due to limited functional knowledge. Therefore, the recalibration of the objectives set by the company led to the decision to implement the system in the formula: "employee with employee", "client with client". With limited technological, functional, and operational knowledge, the firm's management can only rely on the platform architecture and pre-designed AI functions to benefit from AI technologies. For this reason, turning to specialized IT companies opens the perspective of developing one's own internal value and understanding the processes to develop, in the future, new applications.

## Conclusions

Based on our research, we've identified different aspects of a custom IT and AI system that unveils the concept and roles that customers can use to interact with the company. We further highlight certain conditions of these interactions, which include different types of knowledge or organizational processes and availability for new knowledge. However, our work has limitations. We conducted our case study with a company from the food industry, bakery. Although this by customizing the information system meets certain criteria in the concepts of a service platform, the context of the specific industry can influence the efficiency of implementation. The approach was general, limited by aspects that were intended to be confidential. Overall, SMEs have limited resources to invest in digital technologies, while AI requires a large amount of investment and sometimes the results can be disappointing. However, integrated IT and AI systems are becoming necessities for SMEs. Ultimately, AI is a new technology, but it is evolving rapidly and will continue to change the marketing practices of SMEs, such as social media marketing or network capabilities and platform adoption. The combination of AI and other new technologies, such as the Internet of Things (IoT), Augmented Reality (AR) and Virtual Reality (VR), could further revolutionize the marketing practices of SMEs. Therefore, we suggest that the presented model, architecture, and algorithm, with the characteristic feature of the company's activity, in which the goods obtained have a validity of 48 hours, can be of help to companies specialized in IT, in exploring how a company wants to customize the system, in the practices of CRM, in the context of B2B and B2C.

## References


Agnihotri, R., Mani, S., Chaker, N. N., Daugherty, P. J., & Kothandaraman, P. (2020). Drivers and performance implications of frontline employees' social capital development and maintenance: The role of online social networks. Decision Sciences.

Battor, M., & Battor, M. (2010). The impact of customer relationship management capability on innovation and performance advantages: Testing a mediated model. *Journal of Marketing Management, 26*(9–10), 842–857





Bell, S. J., Auh, S., & Eisingerich, A. B. (2017). Unraveling the customer education paradox: When, and how, should firms educate their customers? Journal of Service Research, 20(3), 306–321.

Delloitte. (2020). *COVID-19: Confronting uncertainty through & beyond the crisis*. 〈ww2.deloitte.com/global/en/pages〉

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kar, A. K., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., ... Williams, M. D. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 57*(July), 0–1.

Fleming, D., Lynch, P., & Kelliher, F. (2016). The process of evaluating business to business relationships facing dissolution: An SME owner manager perspective. Industrial Marketing Management, 58, 83–93.

Pineiro-Chousa, J., Lo´pez-Cabarcos, M.A´., & Ribeiro-Soriano, D. (2021). The influence of financial features and country characteristics on B2B ICOs' website traffic. International Journal of Information Management, 59, 102332.

Saura, J. R. (2021). Using data sciences in digital marketing: framework, methods, and performance metrics. Journal of Innovation and Knowledge, 6(2), 92–102.

Seley, A., & Holloway, B. (2008). Sales 2.0: Improve business results using innovative sales practices and technology. Hoboken: John Wiley & Sons.

Wang, L., Luo, X., Yang, X., & Qiao, Z. (2019). Easy come or easy go? Empirical evidence on switching behaviors in mobile payment applications. Information & Management, 56(7), 1–13.

Zhang, C., Wang, X., Cui, A. P., & Han, S. (2020). Linking big data analytical intelligence to customer relationship management performance. Industrial Marketing Management, 91, 483–494.