Integration of customer relationship management in e-commerce

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Abstract: In the contemporary digital landscape, the interconnection between e-commerce and customer relationship management (CRM) is unmistakable. Both are intricately linked by their shared focus on managing customer interactions and elevating customer satisfaction. Emphasising data analysis and technology tools, they collectively aim to enhance the overall customer experience and propel business growth. In the modern business environment, the synergy between CRM and marketing stands as an indispensable element for success. Together, they play a pivotal role in comprehending customer behaviour and preferences. This study delves into the impact of e-commerce and CRM on customer loyalty, specifically examining how to adept utilisation of CRM tools can contribute to heightened customer retention and increased repeat purchases in the realm of online business along with a real-life case study. Through the analysis of customer data and the strategic use of CRM tools, businesses can glean valuable insights into customer preferences and behaviour.

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1 Introduction

E-commerce involves the online exchange of goods and services, while customer relationship management (CRM) focuses on enhancing customer interactions to boost business performance and loyalty. Businesses must employ CRM strategies to connect with customers effectively, track preferences, personalise marketing, and drive revenue. Implementing CRM fosters customer satisfaction, loyalty, and a competitive edge. It also enhances customer service, and operational efficiency, and provides valuable insights. These strategies contribute to increased sales, profitability, positive brand reputation, and market share, which are crucial for long-term success. In the e-commerce sector, a robust CRM strategy is imperative for sustained growth, fostering innovation, attracting top talent, and building strong relationships with customers and stakeholders (Dhanalakshmi et al., 2020; Nogueira and Borchardt, 2022; Guo, 2021).

In the current highly competitive e-commerce environment, customers have a plethora of choices and can swiftly shift to alternatives if their requirements are not fulfilled. The adoption of a proficient CRM strategy empowers businesses to individualise their engagement with customers, comprehend their preferences and buying patterns, and adjust their offerings accordingly (Agarwal, 2018). This not only boosts customer satisfaction and loyalty but also encourages repeat purchases and referrals, ultimately resulting in heightened revenue and expansion within the e-commerce sector. Moreover, it aids businesses in maintaining competitiveness in the market.

2   Overview of e-commerce

An understanding and review of the state-of-the-art approaches of e-commerce is necessary to gain insight into the technology. E-commerce encompasses the online exchange of goods and services through the Internet, involving digital transactions, electronic payments, and virtual communication between businesses and consumers. Key attributes of e-commerce include its convenience, accessibility, global outreach, and ease of comparing prices and products. The 24/7 operational nature of e-commerce provides customers the flexibility to shop at their convenience (Chatterjee et al., 2021). Moreover, it transcends geographical constraints, enabling businesses to reach diverse global markets and broaden their customer base, presenting opportunities for expansion and increased market share. The online ability to compare prices and products facilitates informed consumer choices, fostering competition, innovation, and elevated product quality. E-commerce not only offers inclusivity to individuals with physical disabilities but also widens the customer base, enhancing the overall customer experience (Azeem et al., 2020).

Furthermore, the data gleaned from online transactions provides valuable insights into consumer behaviour and preferences, empowering businesses to refine marketing strategies and enhance customer satisfaction. The recent advancement in technology has brought in various ways of estimating the customer's desire and enhancing their satisfaction such as sentiment analysis through opinion mining (Huang et al., 2023) based on reviews and comments, conversational intelligent agents-based customer analysis using AI-based techniques (Bavaresco et al., 2020) facilitating global market penetration, offering prospects for growth and revenue generation beyond local markets (Ipang et al., 2021). The ease of comparing prices and accessing reviews online empowers consumers to make well-informed decisions, fostering a competitive market environment. The convenience of online shopping, avoiding crowded stores and long checkout lines, saves consumers time and effort, contributing to the rising popularity of e-commerce. Additionally, the wealth of data from online transactions supports targeted advertising, enabling businesses to reach their desired audience more efficiently.

Moreover, e-commerce platforms frequently provide an extensive array of products and services in contrast to traditional brick-and-mortar stores, affording consumers a broader selection. This not only enriches their shopping encounters but also fosters a beneficial competitive environment among businesses, compelling continuous enhancements in their products and pricing structures (Azeem et al., 2020; Fernando et al., 2023; Leela and Bari, 2022). Furthermore, the presence of online reviews and ratings furnishes valuable perspectives from fellow customers, assisting consumers in making informed decisions and bolstering trust in their online purchases.

2.1   Types of e-commerce

For good business planning understanding the different approaches to the implementation of e-commerce platforms is crucial the e-commerce platform can be divided into three fundamental classifications (Mishra et al., 2020) as follows:

- Business-to-business (B2B) e-commerce pertains to transactions between businesses, wherein one business sells its products or services to another. This category of

e-commerce simplifies the procurement process, enabling businesses to efficiently locate suppliers and engage in negotiations.

- Conversely, business-to-consumer (B2C) e-commerce involves transactions between businesses and individual consumers. This form of e-commerce has experienced notable growth in recent times, offering consumers the convenience and accessibility to shop from the comfort of their residences.

- Consumer-to-consumer (C2C) e-commerce comprises transactions between individual consumers, often facilitated through online platforms or marketplaces. In this form of e-commerce, individuals can directly sell their pre-owned goods or services to other consumers, establishing a marketplace for second-hand items and distinctive offerings.

- C2C e-commerce platforms have transformed the dynamics of buying and selling, presenting an extensive array of products and services not commonly found in conventional retail outlets. Moreover, C2C e-commerce opens avenues for individuals to earn income by utilising their resources and skills, nurturing an entrepreneurial spirit within the consumer community.

Table 1 provides the details of the top e-commerce platforms that played a significant role in changing the business dynamics of the companies prevailing on these platforms. These platforms have played a role in the ascent of the sharing economy, enabling individuals to temporarily rent out their possessions or provide services. This not only offers consumers more economical choices but also champions sustainability by diminishing waste and encouraging the reuse of goods.

Table 1   Leading e-commerce companies

Sl. no.	Company	Country
1	Amazon	USA
2	Alibaba	China
3	eBay	USA
4	Jingdong	China
5	Zappos	USA
6	Rakuten	USA
7	HopeDepot	Japan
8	Fliupkart	Germany
9	Zalanda	Japan
10	Otto	USA

2.2   Significance of e-commerce

The expansion and importance of e-commerce in today's business landscape cannot be understated. With the increasing availability of the internet and technological advancements, online shopping has become the preferred avenue for consumers to acquire goods and services. This shift has compelled traditional brick-and-mortar retailers to adjust their strategies to stay competitive. Additionally, e-commerce has broadened

horizons, enabling businesses to connect with customers globally and enlarge their customer base. The convenience and effectiveness of online shopping have transformed the shopping experience, integrating it as a crucial aspect of contemporary business operations.

Moreover, online shopping presents a diverse array of products and empowers customers to compare prices and read reviews before committing to a purchase. This empowerment aids consumers in making more informed decisions and fosters increased competition among retailers. The ability to shop from the comfort of home has further fuelled the growth of online shopping, eliminating the necessity for physical travel and saving time for busy individuals.

Furthermore, online shopping has provided opportunities for small businesses and entrepreneurs to tap into a global customer base, breaking down geographical barriers. This has resulted in enhanced market reach and growth potential, creating a more level playing field with larger retailers (Yunus et al., 2022). Additionally, the convenience of online shopping extends beyond time-saving; it also ensures 24/7 accessibility, allowing customers to shop at their convenience without being constrained by store hours.

3   Customer relationship management

CRM encompasses the strategies, technologies, and practices utilised by businesses to manage and assess customer interactions and data throughout the entire customer lifecycle. It entails the collection and analysis of customer information to enhance satisfaction, loyalty, and retention. CRM systems empower businesses to monitor customer preferences, purchase history, and communication interactions, enabling personalised marketing efforts and improved customer service. The recent advancements in disruptive technology such as AI and ML integrated with the CRM process and strategies (Chatterjee et al., 2021), and augmented reality (Dhanalakshmi et al., 2020) have a long-term empirical impact on customer retention, businesses can forge stronger relationships, boost customer loyalty, and drive overall business growth. CRM systems are instrumental in identifying and targeting potential customers, directing marketing efforts toward those more likely to convert into paying customers (Azeem et al., 2020; Fernando et al., 2023; Leela and Bari, 2022).

Moreover, CRM systems furnish valuable insights into customer behaviour and trends, aiding businesses in making informed decisions and adapting strategies to evolving customer needs. Furthermore, these systems streamline sales processes by automating tasks like lead generation, follow-ups, and order processing. This not only conserves time and resources but also enhances overall efficiency and productivity. Additionally, CRM systems can seamlessly integrate with other business tools and software, such as email marketing platforms or social media management tools, offering a comprehensive view of customer interactions across various channels. This integration allows businesses to execute personalised and targeted marketing campaigns, thereby elevating the overall customer experience (Kampani and Jhamb, 2020).

3.1   Benefits of CRM

1   Efficient customer data management in e-commerce is facilitated by CRM systems, allowing businesses to centralise and structure customer data. This simplifies the

tracking and analysis of customer behaviour, preferences, and purchase history. Consequently, businesses can adopt data-driven decision-making processes and customise their marketing strategies based on the insights derived.

2 Boosting customer retention and loyalty is achievable through the utilisation of CRM tools in e-commerce. These tools empower businesses to craft personalised experiences for customers, whether through targeted offers or proactive customer support. This approach strengthens customer relationships, heightens satisfaction, and ultimately contributes to improved customer retention and loyalty.

3 Enhancing sales performance is achievable through CRM systems, offering visibility into sales pipelines. This allows businesses to monitor leads, pinpoint potential bottlenecks in the sales process, and optimise sales strategies. The streamlined sales workflows and real-time visibility provided by CRM systems contribute to the improvement of sales performance and the facilitation of revenue growth.

4 Enabling efficient customer service is a key function of CRM systems, allowing businesses to centralise tracking of customer inquiries, complaints, or feedback across various channels. This ensures prompt responses and effective resolution of issues, ultimately enhancing customer satisfaction and fostering a positive brand reputation.

5 Empowering data-driven marketing campaigns is a capability of CRM systems in e-commerce. These systems enable businesses to categorise their customer base using diverse criteria, such as demographics or purchase history. Through this segmentation, businesses can implement targeted marketing campaigns tailored to specific customer segments, leading to increased conversion rates and return on investment (ROI).

6 Facilitating business scalability is crucial as e-commerce enterprises expand, facing the challenge of handling a growing customer base. CRM systems offer scalable solutions capable of managing increased volumes of customer data while upholding data integrity and security.

Incorporating a CRM system in e-commerce has the potential to optimise operations, enhance customer relationships, propel sales growth, and establish enduring success in a fiercely competitive market.

3.2 *Components and key features*

Components and essential features within CRM systems encompass customer data management, enabling businesses to store and organise customer information centrally. This fosters a comprehensive understanding of customers and facilitates personalised interactions. Additionally, CRM systems frequently incorporate sales automation tools like lead management and opportunity tracking, streamlining sales processes for heightened efficiency (Farmania et al., 2021). Moreover, these systems often include marketing automation capabilities, automating campaigns, and assessing the effectiveness of marketing endeavours. These features collectively contribute to the efficacy of CRM systems, augmenting customer relationships and fostering business growth.

Furthermore, CRM systems provide tools for customer service management, aiding businesses in efficiently tracking and resolving customer issues. This, in turn, sustains

elevated levels of customer satisfaction and loyalty. Additionally, CRM systems commonly integrate with various business applications, such as email marketing platforms and social media management tools, offering a comprehensive overview of customer interactions across diverse channels (Racbhini et al., 2021). This integration enhances businesses' capacity to deliver personalised and targeted marketing messages. It facilitates the analysis of customer behaviour and preferences, optimisation of marketing strategies, and increased customer engagement.

4   Implementing CRM in E-commerce

The systematic methodology for seamlessly integrating the CRM process into the E-commerce platform is crucial to the business's success. The general methods that can be followed by the e-commerce strategist can be guided as in Figure 1.

Figure 1   Methodology of CRM process in e-commerce platform (see online version for colours)
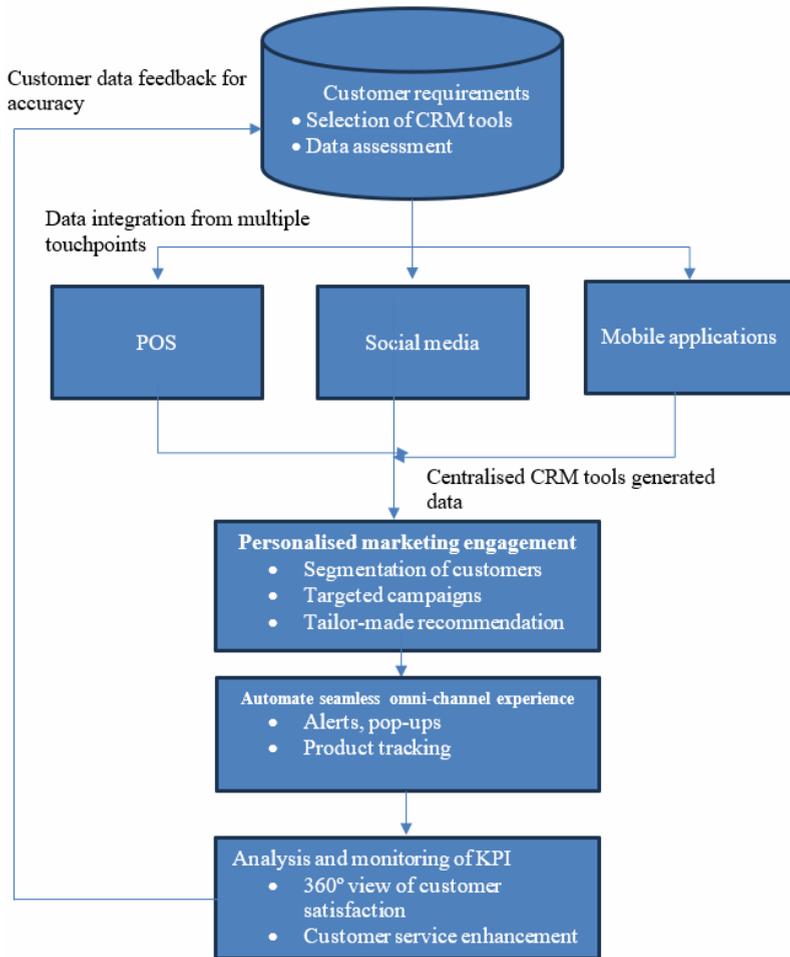
Data collection and analysis are pivotal in the implementation of CRM in e-commerce. Through the collection and analysis of customer data, businesses can acquire valuable insights into customer preferences, behaviours, and purchasing trends. Utilising this information enables the personalisation of marketing messages, customisation of product recommendations, and enhancement of overall customer satisfaction. Furthermore, data analysis empowers businesses to recognise trends and patterns, facilitating informed business decisions and the optimisation of sales and marketing strategies.

Moreover, the process of data collection and analysis empowers businesses to gauge the efficacy of their CRM implementation and quantify the ROI. Through the monitoring of key performance indicators like customer retention rates, conversion rates, and customer lifetime value, businesses can KPI evaluate the effectiveness of their CRM strategies. This assessment allows them to make essential adjustments for improved results, emphasising the significance of continuous evaluation and optimisation in ensuring long-term success in e-commerce CRM implementation (Guo, 2021).

4.1 Strategies

CRM systems encompass vital components and features, starting with customer data management, enabling businesses to centralise the storage and organisation of customer information. This centralised approach provides businesses with a holistic perspective of their customers, facilitating personalised interactions. Additionally, CRM systems often incorporate sales automation tools like lead management and opportunity tracking, streamlining sales processes and bolstering efficiency (Azeem et al., 2020). Furthermore, these systems frequently boast marketing automation capabilities, empowering businesses to automate marketing campaigns and assess the effectiveness of their marketing endeavours. These attributes collectively contribute to the overall efficacy of CRM systems, elevating customer relationships and fostering business growth.

Furthermore, CRM systems provide tools for customer service management, enabling businesses to proficiently track and resolve customer issues. This proficiency aids in sustaining elevated levels of customer satisfaction and loyalty. Additionally, CRM systems commonly integrate with various business applications, including email marketing platforms and social media management tools, providing a comprehensive overview of customer interactions across diverse channels (Huang et al., 2023). This integration amplifies businesses' capacity to deliver personalised and targeted marketing messages. It facilitates the analysis of customer behaviour and preferences, the optimisation of marketing strategies, and an increase in customer engagement.

CRM systems are essential for executing personalised marketing strategies and providing outstanding customer service. They empower businesses to gather and assess customer data, enabling the customisation of marketing messages and offers based on individual preferences. Furthermore, CRM systems support effective communication and prompt follow-ups with customers, ensuring timely responses to inquiries and swift resolution of concerns. This personalised approach greatly improves the overall customer experience, fostering increased customer engagement and loyalty

Moreover, CRM systems offer businesses valuable insights into customer behaviour and trends, aiding in the identification of upselling and cross-selling opportunities. Through a deep understanding of customer preferences and purchasing patterns, businesses can design targeted campaigns that resonate effectively. This not only

heightens the likelihood of conversion but also optimises the ROI in marketing endeavours. Ultimately, CRM systems empower businesses to cultivate enduring customer relationships, fostering loyalty and repeat business.

Additionally, CRM systems empower businesses to monitor and analyse customer interactions across diverse channels, including e-mail, social media, and phone calls in various domain such as agritech (Goranda et al., 2021), healthcare and so on. This holistic perspective on customer engagement enables businesses to personalise communication and customise offerings based on individual preferences. Consistently delivering pertinent and timely messages allows businesses to establish a profound connection with customers, ultimately elevating customer satisfaction.

5   Challenges and solutions in CRM for e-commerce

5.1   Privacy and security concern

Addressing concerns about data privacy and security within CRM systems is paramount for businesses operating in the e-commerce sector. As the volume of collected customer data grows, it becomes imperative to establish robust security measures that shield sensitive information from unauthorised access and potential breaches. Achieving this involves implementing encryption techniques, routinely updating security protocols, and providing comprehensive training to employees on optimal data protection practices.

Furthermore, businesses must ensure strict compliance with pertinent data privacy regulations such as GDPR or CCPA, cultivating trust with customers by showcasing a commitment to safeguarding their personal information. To bolster security further, regular security audits and penetration testing should be considered, allowing businesses to identify and promptly address vulnerabilities in their systems. Implementing multi-factor authentication and stringent access controls adds a layer of protection to customer data, limiting access to authorised individuals only.

Moreover, prioritising employee training and awareness programs is essential to educate staff on data protection best practices, minimising human error, and preventing internal data breaches. Establishing a robust incident response plan becomes crucial to effectively manage security incidents or breaches, enabling businesses to mitigate impacts and restore customer trust promptly.

Additionally, reinforcing strong access controls and regularly reviewing user privileges enhances data security, ensuring that only necessary personnel have access to sensitive information, thereby reducing the risk of unauthorised access or misuse. Routine security audits and vulnerability assessments help proactively identify weaknesses in the system before they can be exploited by malicious entities.

5.2   Omni-channel CRM in e-commerce

Managing omni-channel CRM in e-commerce introduces unique challenges with the integration of multiple channels and touchpoints. To effectively address these complexities, businesses may opt for sophisticated CRM software that consolidates data from diverse channels, offering a comprehensive perspective on customer interactions. Ensuring seamless operations and consistent customer experiences across all channels

involves providing thorough training to employees on navigating and utilising the omni-channel CRM system.

Moreover, businesses can capitalise on automation and artificial intelligence technologies to streamline and personalise customer interactions within an omni-channel CRM environment. These technologies play a pivotal role in analysing customer data, predicting preferences, and automating targeted marketing campaigns. Ultimately, this approach enhances customer satisfaction and fosters loyalty.

Furthermore, the incorporation of social media platforms into the omni-channel CRM system can significantly elevate customer interactions. This integration enables businesses to actively connect with customers on prevalent social media platforms, addressing their inquiries and feedback promptly while establishing a robust online presence. Additionally, harnessing the data analytics capabilities embedded in the CRM system offers valuable insights into customer behaviour and preferences. This empowers businesses to make informed, data-driven decisions and customise their offerings effectively to meet customer needs.

5.3 A case study on Nike's omni-channel CRM integration

Nike, Inc. is a global leader in athletic footwear, apparel, and equipment that operates in more than 190 countries. Known for its iconic branding and innovative products, Nike serves millions of customers worldwide through both physical retail stores and a robust online presence and it is one of the key players who implemented omni-channel CRM right (Senn, 2016). Having a global customer base across the globe before CRM implementation the company faced challenges such as:

- *Fragmented customer data*, where the customer information was scattered across the geographical region and many channels, including in-store purchases, online purchases, and through mobile POS making it complex to obtain a complete perspective of global customers.

- *Inconsistent customer experience*, where customers using different channels were getting different levels of experiences mostly leading to dissatisfaction due to limited customised and personalised engagements thereby reducing customer retention.

Figure 2 Nike CRM implementation map

Therefore, Nike on struggling to provide personalised preferences to customers and understand the need for providing seamless integration of the customer experience it implemented an omni-channel CRM strategy to consolidate customer data, improve personalisation, and create a consistent brand experience across all customer touchpoints to enhance the customers shopping experience and engagement thereby drive the sales and the implementation map is as shown in Figure 2.

To begin with, the company has to face resistance to adoption and implementation at different levels due to various factors as shown in Table 2. The table depicts the level of resistance faced by different groups on a scale of 1 to 5 (5 being the highest) (Kotter, 2021).

Table 2   Resistance to CRM implementation at different levels and reasons

Department	Scale of resistance	% of employees resistant	Reasons for resistance
Sales	3	20	Fear of job displacement, learning curve, data entry burden
Marketing	2	10	Concern about data privacy, integration with existing tools
Customer service	4	30	Change in workflow, potential loss of autonomy, resistance to standardisation
IT	1	5	Technical concerns, potential compatibility issues
Management	2	15	Cost of implementation, potential disruption to operations

To implement the CRM technology seamlessly into Nike, follow the below process using a omni channel process using salesforce integrated tools,

- *Data integration:* Nike integrated customer data from its e-commerce site, Nike+ mobile app, in-store POS systems, and social media channels into a single CRM platform of salesforce with Skusavvy. This allowed Nike to track customer interactions, purchase history, and preferences in real-time.

- *Personalised marketing and engagement:* Using CRM insights, Nike developed targeted marketing campaigns, personalised product recommendations, and custom loyalty rewards based on individual customer profiles. It also provides a happy post-purchase experience with replacement and 30 days money back guarantees.

- *Seamless omni-channel experience:* Nike ensured that customers could seamlessly transition between online and offline channels. For example, customers could browse products online, check availability in nearby stores, and even reserve items for in-store pickup.

These steps followed by Nike have an identifiable impact on sales and the company as shown in Figure 3. The systematic integration of the complete CRM packages led to a 20% increase in online store sales and, 30% with mobile POS leading to a 25% of customer retention with increased time spent in the stores searching for more shopping options leading to strengthening the customer's brand loyalty.

Therefore, from the Nike case study the takeaway is that to maximise the benefits and to dwell on the best performance initially overcoming the resistance to CRM adoption

and implementation within organisations necessitates effective change management strategies. This involves offering thorough training and support to employees, emphasising the advantages of CRM integration, and addressing any concerns or misconceptions about the system. Additionally, engaging key stakeholders in the decision-making process and showcasing successful case studies of CRM implementation can alleviate resistance and promote buy-in across all organisational levels.

Figure 3   Representation of increase in the sales after CRM integration (see online version for colours)
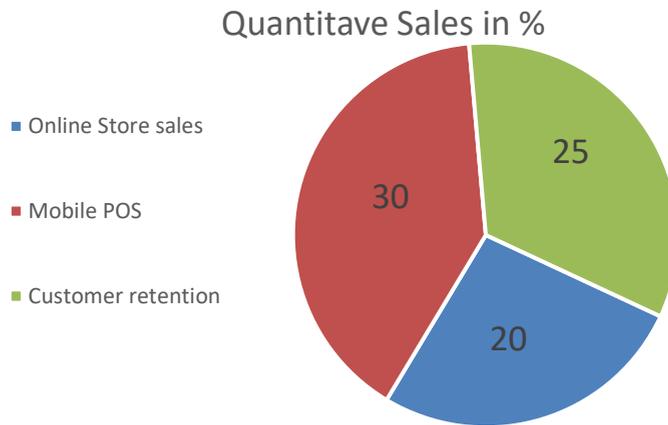
Moreover, establishing a clear communication plan outlining the goals and objectives of CRM implementation helps employees comprehend the purpose and potential impact of the system. Regularly seeking feedback from employees and addressing their concerns throughout the implementation process fosters a sense of ownership and involvement, thereby reducing resistance. Celebrating small victories and acknowledging individuals or teams for successful CRM adoption further motivates employees, reinforcing the system's benefits.

By involving employees at all organisational levels, their input and perspectives are valued, contributing to a more successful CRM implementation. Providing comprehensive training and support builds employee confidence and competence in using the CRM system, enhancing overall buy-in and enthusiasm. A transparent communication plan that regularly updates employees on progress and benefits keeps them informed and engaged, addressing concerns and uncertainties to foster trust and collaboration, ultimately resulting in a smoother and more successful CRM implementation.

## 6   Future trends and innovations in CRM for e-commerce

Revolutionising CRM in e-commerce, emerging technologies like AI using agents specifically cognitive agents (Hegde et al., 2016) and algorithms, IoT and digital twins (Akshay et al., 2024), and chatbots hold significant potential for enhancing customer experiences through personalised recommendations, process automation, and improved communication channels. AI-powered chatbots exemplify this by efficiently handling

customer inquiries in real-time, offering swift and accurate responses. Furthermore, IoT devices play a crucial role in gathering valuable data on customer behaviour and preferences, enabling businesses to tailor their offerings accordingly. As these technologies advance, their impact on the future of CRM in e-commerce is undeniable, promising even more seamless and personalised customer experiences as shown in Figure 4. From the figure, it is evident that the future of the e-commerce platform is dependent on the seamless integration of CRM tools developed using enabling technologies such as AI and its associated.

AI's capability to analyse extensive data sets facilitates pattern and trend identification, allowing businesses to anticipate customer needs and proactively offer relevant products or services. AI-powered virtual assistants further enhance the sales process by providing real-time insights and suggestions during customer interactions. These advancements are set to transform CRM in e-commerce, empowering businesses to cultivate stronger customer relationships and foster long-term loyalty.

Additionally, AI's automation extends beyond customer support to routine tasks like data entry, freeing up valuable time for sales representatives to focus on relationship-building and deal closure. The integration of IoT devices enables businesses to gather real-time customer behaviour and preference data, facilitating more personalised and targeted marketing campaigns. Moreover, the combined use of AI and IoT enhances sales forecasting accuracy by analysing vast datasets, aiding businesses in making informed decisions and optimising sales strategies for better results. This integration also paves the way for proactive customer service, anticipating needs and offering personalised recommendations or solutions in real-time.

Figure 4   Trend on e-commerce, CRM, and AI (see online version for colours)
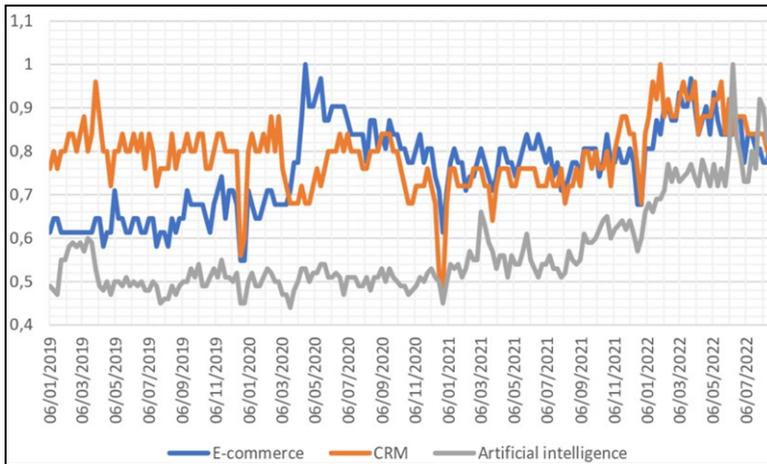
6.1   The role of social media in enhancing CRM efforts in e-commerce

In e-commerce, social media plays a pivotal role in elevating CRM efforts, providing a direct platform for businesses to engage with their customers. Through social media channels, businesses can glean valuable insights into customer preferences, interests, and feedback, leveraging this information to tailor personalised marketing campaigns and

enhance the overall customer experience. Real-time communication on social media allows businesses to promptly and effectively address any customer issues or concerns.

Furthermore, social media platforms offer a convenient and accessible avenue for customers to connect with businesses, facilitating easy interactions for inquiries, feedback, or assistance. This direct and immediate communication fosters stronger relationships between businesses and customers, resulting in heightened customer satisfaction and loyalty. Social media also serves as a rich source of valuable insights through data analytics, allowing businesses to analyse user engagement and interactions. This data-driven approach informs marketing strategies and product development, enabling businesses to customise offerings to better align with customer needs, thereby driving sales and revenue growth. By scrutinising customer preferences and feedback, businesses gain valuable insights into consumer behaviour and trends, staying ahead of the competition.

Moreover, the direct engagement facilitated by social media contributes to building robust relationships and fostering brand loyalty. In essence, social media becomes a powerful tool for businesses to connect with their customer base and enhance CRM strategies in the dynamic landscape of e-commerce.

7 Conclusions

In summary, businesses gaining a competitive edge in today's market prioritise understanding and fulfilling customer needs through data analysis and active social media engagement. The continuous adaptation of offerings based on customer preferences becomes a driving force for sales and revenue growth. The case study of Nike Inc. demonstrates the impact of the implementation of strong CRM strategies on the e-commerce platform evidenced by its success rate. Therefore, establishing robust customer relationships through direct engagement using various touch points such as POS, on social media platforms not only fosters brand loyalty but also positions businesses ahead of their competitors. Overall, the strategic use of customer insights and effective social media utilisation is crucial for thriving in the contemporary business landscape.

Furthermore, social media engagement serves as a valuable platform for businesses to directly gather feedback and suggestions from customers. Capturing these direct inputs through seamless CRM strategies and tools aids in refining products or services, ensuring businesses meet customer expectations more effectively. Ultimately, businesses that centre their focus on customer needs, employ data analysis and engage effectively in customer feedback dynamically stand a greater chance of success in the competitive market.

Data analysis does not just offer insights into customer behaviour; it extends to understanding competitors' strategies and market positioning. Utilising this information helps businesses identify market gaps, allowing them to develop unique selling propositions that set them apart. Even though social media engagement is a powerful tool for businesses to build lasting relationships with customers, fostering loyalty and advocacy that contributes to long-term growth and profitability, However, the main threat during the integration of the CRM strategies with the e-commerce platform is privacy and data security which needs to be tackled carefully using data security technologies

encryption and blockchain (Nuzula et al., 2022). Hence, the success of any e-commerce business platform depends on the systematic implementation of the CRM tools and, therefore the academic and research community have to focus on providing a comprehensive solution in this direction.

References

Agarwal, M. (2018) 'Customer relationship management and its relation to e-commerce', *International Journal of Multidisciplinary Research in Science, Engineering and Technology*, Vol. 1, No. 2, ISSN: 2582-7219.

Akshay, M.J., Premasudha, B.G. and Hegde, S.B. (2024) 'IoT to digital twin: a futuristic smart farming', *International Conference on Smart Systems for applications in Electrical Sciences (ICSSES)*, Tumakuru, India, pp.1–6, DOI: 10.1109/ ICSSES62373.2024.10561335.

Azeem, S., Nasir, N., Kousar, S. and Sabir, S. (2020) 'Impact of e-commerce investment and enterprise performance based on customer relationship management', *International Journal of Psychosocial Rehabilitation*, Vol. 24, No. 9, pp.3998–4006.

Bavaresco, R., Silveira, D., Reis, E., Barbosa, J., Righi, R., Costa, C., Antunes, R., Gomes, M., Gatti, C., Vanzin, M., Clair Jr., S., Silva, E. and Moreira, C. (2020) 'Conversational agents in business: a systematic literature review and future research directions', *Computer Science Review*, Vol. 36, p.100239, ISSN: 1574-0137, https://doi.org/10.1016/j.cosrev.2020.100239.

Chatterjee, S., Rana, N.P., Tamilmani, K. and Sharma, A. (2021) 'The effect of AI-based CRM on organization performance and competitive advantage: an empirical analysis in the B2B context', *Industrial Marketing Management*, Vol. 97, pp.205–219, ISSN: 0019-8501, https://doi.org/10.1016/j.indmarman.2021.07.013.

Dhanalakshmi, A., Hui, X. and Supriya, R. (2020) 'Technological advancements in e-commerce and customer relationship management', *International Journal of Engineering and Management Research*, Vol. 10, No. 6, pp.9–20.

Farmania, A., Elsyah, R.D. and Tuori, M.A. (2021) 'Transformation of CRM activities into e-CRM: the generating e-loyalty and open innovation', *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 7, No. 2, p.109.

Fernando, E., Sutomo, R., Prabowo, Y.D., Gatc, J. and Winanti, W. (2023) 'Exploring customer relationship management: trends, challenges, and innovations', *Journal of Information Systems and Informatics*, Vol. 5, No. 3, pp.984–1001.

Goranda, I.R., Nurhayati, P. and Simanjuntak, M. (2021) 'Analysis of consumer satisfaction and loyalty factors with CRM approach in agribusiness e-commerce company', *Journal of Consumer Sciences*, Vol. 6, No. 2, pp.111–128.

Guo, F. (2021) 'Research on customer relationship management in e-commerce environment', in *IOP Conference Series: Earth and Environmental Science*, IOP Publishing, March, Vol. 693, No. 1, p.12072.

Hegde, S.B., Babu, B.S. and Venkataram, P. (2016) 'A cognitive theory based opportunistic resource pooling technique for adhoc networks', *International Journal of Intelligent Systems*, Vol. 26, No. 1, pp.47–68, ISSN: 2191-026X, DOI: 10.1515/jisys-2015-0050.

Huang, H., Zavareh, A.A. and Mustafa, M.B. (2023) 'Sentiment analysis in e-commerce platforms: a review of current techniques and future directions', in *IEEE Access*, Vol. 11, pp.90367–90382, DOI: 10.1109/ACCESS.2023.3307308.

Ipang, I., Suroso, S. and Novitasari, D. (2021) 'A study on the relationship of e-marketing, e-CRM, and e-loyalty: evidence from Indonesia', *International Journal of Data and Network Science*, Vol. 5, No. 2, pp.115–120.

Kampani, N. and Jhamb, D. (2020) 'Analyzing the role of e-CRM in managing customer relations: a critical review of the literature', *Journal of Critical Review*, Vol. 7, No. 4, pp.221–226.

Kotter, J. (2021) *The 8-Step Process for Leading Change* [online] http://www.kotterinc.com/8-step-process-for-leading-change/.

Leela, M.H and Bari, A.R. (2022) 'Impact of customer relationship management on the business strategies of e-commerce platform', *Technoarete Journal on Advances in E-Commerce and E-Business*, pp.28–34, 2583–3049.

Mishra, D.K., Dey, N., Deora, B.S. and Joshi, A. (2020) 'ICT for competitive strategies', *Proceedings of 4th International Conference on Information and Communication Technology for Competitive Strategies (ICTCS 2019)*, CRC Press, Udaipur, India, 13th–14th December.

Nogueira, E.O. and Borchardt, M. (2022) 'The effects of customer relationship management (CRM) on e-commerce evolution: a systematic review', *Technium Social Sciences Journal*, Vol. 36, No. 1, pp.433–453.

Nuzula, I.F., Muryanto, M.A. and Cuong, V.H. (2022) 'E-commerce, customer relationship management and artificial intelligent amid COVID-19', *Journal of Management Studies and Development*, Vol. 1, No. 2, pp.68–78, https://doi.org/10.56741/jmsd.v1i02.101.

Racbhini, W., Wulandjani, H., Thalib, S., Setiyowati, H. and Sasmito, T. (2021) 'Effect of e-CRM and e-SERVQUAL on e-loyalty through e-satisfaction in millennial generation, study of online shopping behavior in Indonesia', *International Journal Economic and Business Applied*, Vol. 2, No. 2, pp.76–90.

Senn, A. (2016) 'nike-a-case-study-for-what-omnichannel-retail-should-look-like-linkedin-1-outline'.

Yunus, M., Saputra, J. and Muhammad, Z. (2022) 'Digital marketing, online trust and online purchase intention of e-commerce customers: mediating the role of customer relationship management', *International Journal of Data and Network Science*, Vol. 6, No. 3, pp.935–944.