Kuwait Research Journal of
Business Management (KRJBM)

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Customer-Centric Analytics as a Pathway to Data Science Adoption for MSMEs: A Review of Use Cases, Approaches, and Tools

Devi Sambamoorthy[1], Seetharaman A[2], Maddulety K[3]
[1]Research Scholar, SP Jain School of Global Management
[2]Dean Research, SP Jain School of Global Management
[3]Professor and Deputy Director, SP Jain School of Global Management

*Corresponding Author

Devi Sambamoorthy
Research Scholar, SP Jain School of Global Management

Article History
Received: 15.03.2026
Revise : 20.03.2026
Accepted: 08.04.2026
Published: 14.04.2026

DOI:10.61705/KRJBM.2.2.2026.1.12

Keywords: MSMEs adoption of data science, MSMEs data analytics use cases, customer use cases, small data, data science

Abstract: Micro, small, and medium-sized enterprises (MSMEs) lag in adopting technologies. Data science is not an exception. For any business, the customer is king. This paper, through a systematic literature review, examines the use cases available for MSMEs. It lists 14 customer-centric use cases that can lead MSMEs to the adoption of data science. It also provides an approach for applying the use cases. The paper contributes to practice by providing a list of software tools available to MSMEs that can help them to apply the use cases. The zero-cost pathways inform MSMEs of the available options for them to start the digitalization journey without spending on technology acquisition.

Introduction

The adoption of data science by micro, small, and medium-sized enterprises (MSMEs) can be accelerated if the relative advantage of the innovation is established. All businesses have the primary objective of providing an exceptional experience to their customers. Hence, understanding the use cases of customers could influence MSMEs' adoption behavior. MSMEs, the backbone of many economies around the world, are continually in survival mode due to resource and cost constraints. The adoption behavior regarding technology can be categorized as lagging—they adopt only at the late stage. For example, MSMEs have adopted cloud technology only in the last decade, whereas large organizations adopted it when it was launched. MSMEs are likely to be interested in exploring and adopting technologies that could directly enhance their customer-related operations (Polas et al., 2022).

Data science has many use cases. The research problem identified is that MSMEs are unaware of the use cases they can apply to customers. If they were aware of the use cases, they would likely adopt data science techniques. With this in mind, the paper's research questions are as follows: (i) Do MSMEs know the customer use cases of data science? (ii) Do MSMEs know how to apply the use cases in their firms? (iii) Are there any tools that the MSME can use to apply these use cases in their firms? Thus, the research objectives are (i) to find MSMEs easy-to-use data analytics use cases for customers through secondary research, (ii) to provide an approach on how these data analytics use cases can be applied, and (iii) to provide the tools that can help them to apply the use cases in their firms.

The next section discusses the findings from the literature review; this is followed by Section 3,

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

which outlines the materials and methods of the present research. The fourth section presents the results and findings. The fifth section provides the conclusion and summarizes the findings, limitations, and future research recommendations.

1. Literature Survey

Customer experience has been extensively conceptualized in seminal models. Emotions, enjoyment, and imagination are as important as functionality (Holbrook & Hirschman, 1982; Zha et al., 2023). This finding has broadened marketing perspectives beyond product features to include affective and sensory engagement. Controllable factors, such as pricing and loyalty programs, and uncontrollable factors, including social or situational influences, form the customer experience (Verhoef et al., 2009).

2.1 MSMEs and technology adoption

MSMEs are defined by their size—namely, by the number of employees and/or annual turnover (De Simone et al., 2023; Liu et al., 2024). MSMEs are agile due to their small size and less hierarchical structure, meaning that decisions can be made quickly (Cadden et al., 2023). MSMEs are also resource-constrained (Le Dinh et al., 2025) and generally in survival mode as compared to larger enterprises. Most MSMEs adopt new technologies late, only when there is no option but to do so (Bettoni et al., 2021; Polas et al., 2022). The owner-manager, through their leadership, plays a major role in bringing in new technologies (Maroufkhani et al., 2020). From that point, it is the employees who execute the adoption of the new technology (Bunjak et al., 2022).

2.2 Benefit of technology adoption

Utilizing the diffusion of innovation theory, Rogers (1983) showed that one of the innovation characteristics is providing a relative advantage. Relative advantage is defined as “the degree to which an innovation is perceived as being better than the idea it supersedes.” (Rogers, 1983b p. 14) Hence, for MSMEs to adopt data science, it is pertinent to provide information on the benefits of the innovation (Chen et al., 2022; Le Dinh et al., 2025). If it is shown that doing so will provide them with a competitive advantage, MSMEs will be more likely to be interested in adopting a technology such as data science (Behl et al., 2022).

2.3 Definitions

Use cases are a business problem or opportunity that analytics can address by delivering a specific outcome (De Simone et al., 2023). For MSMEs, the areas that artificial intelligence (AI) applications can enhance include operational efficiency, product development, customer engagement, and competitive advantage (Le Dinh et al., 2025). The prominent use cases are lead scoring (Abdul-Yekeen et al., 2024), next best action prediction (Abdul-Yekeen et al., 2024), marketing campaign optimization (Abdul-Yekeen et al., 2024), audience segmentation (Wolniak, 2023), churn prediction (Akpe et al., 2021), personalized offerings (Ingriana et al., 2024), and recommendation systems (Yörük, 2025).

Methodologies are a broad conceptual approach or analytical framework used to study or solve a use case (De Simone et al., 2023). They are required to use the technology, and they are inherent components of the technical system (Härting & Sprengel, 2019; Oesterreich et al., 2022). Examples include segmentation frameworks and design thinking (Mortati et al., 2023).

Techniques are a specific analytical procedure used to execute a methodology (Perdana et al., 2022a). The main types are descriptive (what happened?), diagnostic (why did it happen?), predictive (what could happen?), and prescriptive (what should happen?) (Micus et al., 2023). Other examples include sentiment analysis and feature selection.

Algorithmic tools are mathematical, statistical, or machine learning models used to perform a technique (Micus et al., 2023); examples include K-means, RNN, support vector machines, and random forests (Le Dinh et al., 2025; Werner et al., 2023).

These algorithmic tools deployed in commercial software products, platforms, or programming languages are called the software tools (De Simone et al., 2023; Justy et al., 2023; Perdana et al., 2022b; Perdana et al., 2022a). These tools could be programming languages, such as Python or R (El Mestari et al., 2024; Klee et al., 2021), or user-friendly software tools with which MSMEs interact directly (Justy et al., 2023), such as Microsoft Excel, to derive meaningful information from their data.

2.4 Gaps in the literature

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

The literature studied recommends examining the benefits of the adoption. First, investigations into the application of AI are focused only on maintenance and quality, and other application domains are less investigated (De Simone et al., 2023). Second, future research should focus on acceptability from a specialized standpoint, such as customers, product development, and marketing (Lada et al., 2023). Third, research should be conducted on how MSMEs can increase their customer knowledge by deploying data analytics (Justy et al., 2023). Simply having access to large volumes of customer data may not be enough; the critical missing link is the ability to extract actionable knowledge from this data for value creation. This highlights a limitation in focusing solely on data acquisition without a corresponding strategy for knowledge extraction and application (Lettner et al., 2022). Future research should investigate how data analytics contributes to building dynamic capabilities (which includes agility) and resilience in SMEs in turbulent environments (Justy et al., 2023). It should also be noted that SMEs may experience limited performance benefits from a strong customer focus because their ability to respond quickly to customer needs is often hampered by limited resources (Zastempowski & Cyfert, 2021). Finally, further research into how data analytics affect stakeholder satisfaction is recommended (Shaik et al., 2024).

2. Materials and Methods

This paper followed a structured literature review approach. The PRISMA style screening process was applied. The objective was to find customer-related data analytics use cases applicable to MSMEs. Google Scholar was the primary database consulted. The other databases considered were Taylor and Francis Online, EBSCO, Science Direct, ResearchGate, and ProQuest. The keywords used for the search were "customer use cases," "customer analytics," and "MSME data science adoption." This study was interested in all the use cases that have been generated to date. Thus, the year of publication was not included in the search criteria. Further, to provide certain foundational definitions, this paper also referred to a few seminal papers. The search yielded 157 papers. After removing duplicates and excluding articles that were not accessible, a total of 100 articles remained. From these papers, the title, conclusion, abstract, and findings were evaluated for the relevance of the topic chosen. Papers purely technical in nature, unrelated to customers, or not relevant to MSME contexts were excluded. A total of 62 papers met the eligibility criteria and were included in the final review. The use cases identified from these papers were synthesized and organized according to the four stages of the customer journey: presales, sales, post-sales, and support.

3. Results and Discussion

The customer experience journey can be structured into three temporal phases: pre-purchase, purchase, and post-purchase (Lemon & Verhoef, 2016). It represents a subjective and spontaneous reaction to interactions with a firm, whether direct or indirect (Guyader et al., 2022; Sykora et al., 2022). Customer experience is a process that unfolds through discovery, evaluation, purchase, integration, and extension (Chi et al., 2024). Rather than being a one-time encounter, it is a continuing phenomenon that evolves as the relationship between a customer and a firm deepens. Enhancing the customer experience helps MSMEs gain satisfied and loyal customers (Perdana et al., 2022b). Customer satisfaction is the cornerstone of the customer experience, representing a customer's contentment with a product or service. It is transactional and context-specific, influenced by service quality, product features, and after-sales support (Ghomi et al., 2021). The challenge for companies is to link satisfaction across all customer journey touchpoints and master the digital journey (Sakas et al., 2023). Customer loyalty refers to extended satisfaction. The satisfaction is transactional and denotes a one-time event, whereas loyalty indicates an extended satisfaction that motivates repeated purchases (Oh et al., 2019). Striving for a better understanding of customer needs is pertinent (Hult et al., 2022). Data science and data analytics present opportunities for SMEs to achieve a greater understanding of clients and markets, enabling them to analyze and predict customer behavior. This can lead to more effective decision-making and provide the ability to respond to customer requests and grievances in real time (Berisha et al., 2022; Nasrollahi et al., 2021; Rautenbach et al., 2022; Vicario & Coleman, 2020).

4.1. Customer Use Cases for MSMEs

MSMEs can design personalized marketing

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

initiatives by interpreting customer insights, which promotes satisfaction and loyalty (Suryawijaya & Wardhani, 2023). Strategies focused on product quality, service excellence, and cultural alignment enhance customer engagement and retention (Toha & Habibah, 2023). Customer analytics—a branch of data science—plays an essential role in managing the experience, reinforcing the importance of data-driven methods for MSME performance (Hossain et al., 2023). Smaller firms often lack specialized customer experience teams; for such organizations, data science applications enable scalable personalization by integrating data from customer relationship management (CRM) platforms, social media, and service records (Santolin et al., 2023). Being "big-data fit" allows organizations to communicate effectively with customers across multiple digital touchpoints (Itani et al., 2024).

The following themes emerged when studying the customer-related use cases: (i) customer acquisition and targeting, (ii) customer experience enhancement, (iii) customer retention and loyalty, and (iv) customer service and support improvement. These themes can be mapped onto the customer journey pre-purchase, purchase, and post-purchase.

4.1.1. Use cases that can be applied pre-purchase

The customer is called a prospect or existing customer at this stage, depending on their relationship with the MSME. If they are making a first-time purchase, they are prospecting the business. If they are purchasing again, they are called an existing customer. This section discusses the use cases that are applicable only for the "prospect."

Predictive Lead Scoring

Every prospect is assigned a score based on their profile, their behavior with the firm based on their interactions, and other factors, such as how interested they are in the business, as observed through factors such as their responses to marketing emails and whether they have downloaded content from the firm's website (Zulaikha et al., 2025). Profile could be the size of the prospect's firm, their industry, their employee strength, or other important metrics. These correlate with the buying commitment (Abdul-Yekeen et al., 2024).

Campaign Effectiveness

The cost of customer acquisition, the success rate of a campaign, and lead conversion time determine the effectiveness of a campaign (Abdul-Yekeen et al., 2024). This information allows the firm to compare its various campaigns and predict and model future campaigns (Abdul-Yekeen et al., 2024).

Segmentation

Prospects are categorized based on various factors, such as age, gender, interests as shared with the firm, and purchasing patterns. Such segmentation helps firms conduct targeted marketing efforts (Alves Gomes & Meisen, 2023; Brown et al., 2024; Ingriana et al., 2024; Wolniak, 2023). Segmentation can also be applied to existing customers, targeting, and brand positioning to retain existing customers and increase revenue (Justy et al., 2023).

Pre-Purchase Use Cases Not Considered

The next best action prediction and multivariate testing on campaign optimization are the available use cases at this step and were not considered.

4.1.2. Use cases that can be applied during purchase

At this stage, the customer has already purchased the service or the product.

Personalized Content

MSMEs can customize and personalize their offering to match customer preferences (Handayati et al., 2024; Motevalli & Razavi, n.d.). They can accurately predict customer preferences (Acciarini et al., 2023), collect information on changing habits, and identify similarly behaving customer clusters (Jiwat & Zhang, 2022)—steps that have been shown to increase customer satisfaction and loyalty (Rane, 2023). They can make dynamic decisions based on personalization and offer real-time customization (Theodorakopoulos & Theodoropoulou, 2024).

Customer Journey Mapping

A customer journey to a business commences from the time the customer hears about the firm, and the journey continues from there on, even after the purchase (Abdul-Yekeen et al., 2024). MSMEs can understand customer sentiments at various stages of the journey from past interactions, which can allow them to identify the touchpoints that are working well and distinguish them from those that are not (Theodorakopoulos & Theodoropoulou, 2024).

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Purchase Use Cases Not Considered
Recommendation systems and dynamic pricing strategies are the available use cases at this step and were not considered.

4.1.3. Use cases that can be applied post-purchase
One of the major costs for MSMEs is customer acquisition. Data analytics can help firms reduce this cost significantly by nurturing loyal customers. The use cases that can be applied at this stage are described below.

Churn Prediction
Data analytics can help MSMEs find the customers who are not purchasing and predict churn; it can also identify at-risk customers to take immediate action (Motevalli & Razavi, n.d.). This is specifically useful for MSMEs in the retail business, where customer volume is high.

Customer Lifetime Value
Analytics helps firms identify the customer lifetime value and predict the profitability of a customer. This is based on the effort involved in making them purchase, providing solutions, and handling post-purchase queries and is not solely focused on revenue (Wolniak, 2023). Predicting customer lifetime value can also help firms with sales forecasting (Jiwat & Zhang, 2022).

RFM and Loyalty
Data analytics can help MSMEs find customers who have purchased recently, frequently, and with high value (RFM). Through this RFM analysis, firms can identify the most valuable customers and provide more loyalty benefits to them (Famoti et al., 2025). It can also assist in identifying upselling and cross-selling opportunities (Acciarini et al., 2023).

4.1.4. Use cases that can be applied during support
Support phase occurs post-sales, but during this phase, the MSME and the customer's relationship is not passive: the MSME is actively involved in providing after-sales support.

Sentiment Analysis
Using natural language processing and text mining, firms can perform sentiment analysis to understand how well they are performing by mining content in the public domain, such as website reviews and social media comments about the brand (Bogoevici et al., 2024).

Predictive Service
Analytics can predict high-traffic volumes or future needs, helping support personnel be prepared (Zulaikha et al., 2025). This can enable proactive service delivery.

AI Chatbots
Data can reveal the direction of customer interactions with a business on a service. This understanding can help firms implement an AI chatbot that handles the website inquiries and hands off to the human sales personnel only if there is a likelihood of sale or if there is any question that the chatbot cannot answer (Rana et al., 2025; Rane, 2023). This provides savings to MSMEs in the form of reduced sales personnel. It also helps firms to be available 24/7, as the chatbot can be deployed throughout the day.

Operational Efficiency in Service
Analyzing data from customer interactions helps firms identify bottlenecks of service and act on them (Brown et al., 2024). This streamlines MSMEs' support and operations, increasing customer satisfaction and loyalty.

4.2. Approach to Apply the Use Cases
MSMEs must collect the customer data. Currently, such data can be collected via numerous methods, including scribbling pads, spreadsheets, and sophisticated CRMs. Along with capturing prospect information, such as lead source, inquiry, and demographics, firms must establish processes to capture the interactions with the lead. They must also capture the time of lead arrival and the time of sale to capture duration of the sale. If the sale is lost, they must capture the reason for it.

Once a sale is confirmed, firms must have an operational process for reviewing the information collected during the sale to ensure a personalized offering where feasible. During the after-sales support process, any queries raised by the customer and the responses provided must be documented. A knowledge base must be continually created.

The sales team can act as a CRM team once the sales support period is over. They act as a touchpoint and point of contact for the customer for future sales and queries about the current offerings.

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

If a firm establishes this simple practice and processes, it will be ready to use the 14 use cases discussed in section 4.1.

4.3. Software Tools Available for MSMEs to Apply the Use Cases

Software tools are technologies that MSMEs can use to apply the use cases and derive the benefits of data science adoption. The following section lists the tools available for MSMEs.

For zero-cost adoption pathways, the freemium or community editions of these tools can be considered. Most of the tools listed below offer free plans for one or two users.

Table 1

Use Case	Free Tools (Zero Cost)	Cost
Predictive Lead Scoring	HubSpot CRM Free, Bitrix24 Free	Free
Campaign Effectiveness	Mailchimp Free (basic analytics), Brevo Free, HubSpot Free Marketing	Free
Segmentation (Prospect/Customer)	HubSpot Free (lists), Bitrix24 Free, Google Sheets + Looker Studio	Free
Personalized Content	Mailchimp Free (basic personalization), Brevo Free	Free
Customer Journey Mapping	HubSpot CRM Free (basic journeys), Google Looker Studio	Free
Churn Indicators (basic)	HubSpot CRM Free (engagement signals), Bitrix24	Free
Customer Lifetime Value (simple formulas)	Google Sheets, Looker Studio Zoho Analytics Free Edition	Free
RFM (manual or semi-automated)	Google Sheets + Looker Studio templates	Free
Upsell/Cross-Sell (basic)	Google Analytics 4 Free (behavior paths), Looker Studio	Free
Sentiment Analysis	Google Cloud NL Demo (free limited), Social Searcher Free, Twitter/X native analytics	Free
Predictive Service (simplified forecasting)	Google Sheets (FORECAST.ETS), Looker Studio	Free
AI Chatbots	Tidio Free Plan, ManyChat Free, Crisp Chat Free	Free

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Operational Efficiency in Service	Trello Free, Bitrix24 Free (task tracking), HubSpot Free (tickets)	Free
Customer Acquisition Cost (simple model)	Google Sheets + Looker Studio	Free

If MSMEs systematically allocate a budget for technology, the following table can be considered. The applications mentioned here have a cost of less than USD 300.

Table 2

Use Case	**Low-Cost MSME Tools (< USD 300/year)**	**Approx. Annual Cost (USD)**
Predictive Lead Scoring	Zoho CRM Standard, Freshsales Growth	144–180
Campaign Effectiveness	Zoho Campaigns (paid tier), HubSpot Starter Marketing	90–216
Segmentation (Prospect/Customer)	Zoho Analytics Basic, Pipedrive Essential	300–150
Personalized Content	Zoho PageSense, HubSpot Starter	240–216
Customer Journey Mapping	Zoho CRM Journeys, Freshsales Growth	144–180
Churn Prediction	Zoho CRM (Zia Signals), Zoho Analytics	144–300
Customer Lifetime Value (CLV)	Zoho Analytics, Odoo Subscription (single user)	300–288
RFM & Loyalty	Zoho CRM RFM Widget, Odoo Loyalty Module	144 – 288
Upsell/Cross-sell	Zoho Commerce (Analytics), Odoo Sales Module	300–288
Sentiment Analysis	Zoho Desk Pro (Sentiment), Zoho Social Standard	180–228
Predictive Service	Zoho Analytics Forecast, Freshdesk Growth	300–180
AI Chatbots	Zoho SalesIQ Answer Bot, Odoo Live Chat	144–288

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Operational Efficiency in Service	Zoho Desk Pro, Odoo Helpdesk	180–288
Customer Acquisition Cost (CAC)	Zoho Books + Zoho Analytics Basic, Odoo Accounting	180–300

4. Conclusion

This paper provided 14 use cases for MSMEs on customers to adopt data science. It also defined and mapped the use cases to low-code/no-code software, explaining the methodology, techniques, and algorithmic tools available. The article offered practitioners an approach to applying the use cases. Future researchers should review use cases other than the customer, such as data culture and productivity improvement.

Second, the study provided an elaborate list of use cases. It is recommended that future researchers apply a case study to validate the benefits that MSMEs can derive through these use cases. Third, the findings can be reviewed through a structured interview with data science practitioners to discover more use cases in the customer spectrum. SMEs often struggle to accurately measure real performance gains and the actual business value created through the adoption of data analytics. This general limitation applies to quantifying the direct impact on customer satisfaction, making it challenging to assess the precise return on investment in customer-focused analytics initiatives (Justy et al., 2023). Finally, future research should examine the algorithmic tools that are available for the small amounts of data that MSMEs can generate. This study's contribution to practice is significant. With the 14 use cases and the approach and tools, MSMEs are armed with a practical guide that can accelerate the adoption of data science.

5. References

1. Abdul-Yekeen, A. M., Kolawole, M. A., Iyanda, B., & Abdul-Yekeen, H. A. (2024). LEVERAGING PREDICTIVE ANALYTICS TO OPTIMIZE SME MARKETING STRATEGIES IN THE US. *Journal of Knowledge Learning and Science Technology ISSN: 2959-6386 (Online)*, *3*(3), 73–102. https://doi.org/10.60087/jklst.vol3.n3.p73-102
2. Acciarini, C., Cappa, F., Boccardelli, P., & Oriani, R. (2023). How can organizations leverage big data to innovate their business models? A systematic literature review. *Technovation*, *123*, 102713. https://doi.org/10.1016/j.technovation.2023.102713
3. Akpe, O. E., Mgbame, A. C., Ogbuefi, E., Abayomi, A. A., & Adeyelu, O. O. (2021). Predictive Analytics and Scenario Modeling for SME Survival and Competitiveness. *Journal of Frontiers in Multidisciplinary Research*, *2*(1), 101–112. https://doi.org/10.54660/.IJFMR.2021.2.1.101-112
4. Alves Gomes, M., & Meisen, T. (2023). A review on customer segmentation methods for personalized customer targeting in e-commerce use cases. *Information Systems and E-Business Management*, *21*(3), 527–570. https://doi.org/10.1007/s10257-023-00640-4
5. Behl, A., Gaur, J., Pereira, V., Yadav, R., & Laker, B. (2022). Role of big data analytics capabilities to improve sustainable competitive advantage of MSME service firms during COVID-19 – A multi-theoretical approach. *Journal of Business Research*, *148*, 378–389. https://doi.org/10.1016/j.jbusres.2022.05.009
6. Berisha, B., Mëziu, E., & Shabani, I. (2022). Big data analytics in Cloud computing: An overview. *Journal of Cloud Computing*, *11*(1), 24. https://doi.org/10.1186/s13677-022-00301-w
7. Bettoni, A., Matteri, D., Montini, E., Gładysz, B., & Carpanzano, E. (2021). An AI adoption model for SMEs: A conceptual framework. *IFAC-PapersOnLine*, *54*(1), 702–708. https://doi.org/10.1016/j.ifacol.2021.08.082
8. Bogoevici, F., Albu, O., Duță, R., & Chitca, C. (2024). Machine Learning Empowerment in Industry 4.0 – Case Study for Micro and Small Enterprises in Romania. *Proceedings of the International Conference on Business Excellence*, *18*(1), 3357–3373.

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

9. https://doi.org/10.2478/picbe-2024-0274
10. Brown, W., Wilson, G., & Johnson, O. (2024). *Understanding the Role of Big Data Analytics in Enhancing Customer Experience*. Business, Economics and Management. https://doi.org/10.20944/preprints202408.0365.v1
11. Bunjak, A., Bruch, H., & Černe, M. (2022). Context is key: The joint roles of transformational and shared leadership and management innovation in predicting employee IT innovation adoption. *International Journal of Information Management*, *66*, 102516. https://doi.org/10.1016/j.ijinfomgt.2022.102516
12. Cadden, T., Weerawardena, J., Cao, G., Duan, Y., & McIvor, R. (2023). Examining the role of big data and marketing analytics in SMEs innovation and competitive advantage: A knowledge integration perspective. *Journal of Business Research*, *168*, 114225. https://doi.org/10.1016/j.jbusres.2023.114225
13. Chen, C., Choi, H. S., & Ractham, P. (2022). Data, attitudinal and organizational determinants of big data analytics systems use. *Cogent Business & Management*, *9*(1), 2043535. https://doi.org/10.1080/23311975.2022.2043535
14. Chi, D. T. P., Hoa, N. V., Thu, P. V., Tuan, N. A., & Nguyen, H. T. (2024). Customer Experience Management in Retail Business: A Theoretical Debate. *International Journal of Advanced Multidisciplinary Research and Studies*, 10.
15. De Simone, V., Pasquale, V. D., & Miranda, S. (2023). An overview on the use of AI/ML in Manufacturing MSMEs: Solved issues, limits, and challenges. *Procedia Computer Science*, *217*, 1820–1829. https://doi.org/10.1016/j.procs.2022.12.382
16. El Mestari, S. Z., Lenzini, G., & Demirci, H. (2024). Preserving data privacy in machine learning systems. *Computers & Security*, *137*, 103605. https://doi.org/10.1016/j.cose.2023.103605
17. Famoti, O., Paul-Mikki Ewim, C., Eloho, O., Muyiwa-Ajayi, T. P., Nwanneka Ezechi, O., Paul-Mikki Ewim, C., & Ehiaghe Omokhoa, H. (2025). Revolutionizing Customer Experience Management through Data-Driven Strategies in Financial Services. *International Journal of Advanced Multidisciplinary Research and Studies*, *5*(1), 948–957. https://doi.org/10.62225/2583049X.2025.5.1.3748
18. Ghomi, V., Gligor, D., Parast, M., Shokoohyar, S., & Esfahani, M. G. (2021). Antecedents and consequences of customer flexibility: Establishing the link to firm competitive advantage. *Journal of Retailing and Consumer Services*, *62*, 102609. https://doi.org/10.1016/j.jretconser.2021.102609
19. Guyader, H., Ponsignon, F., Salignac, F., & Bojovic, N. (2022). Beyond a mediocre customer experience in the circular economy: The satisfaction of contributing to the ecological transition. *Journal of Cleaner Production*, *378*, 134495. https://doi.org/10.1016/j.jclepro.2022.134495
20. Handayati, R., Haliza, S. N., Haqqoh, A., Kumalasari, E. N., & Saputra, Y. (2024). Strategies for SMEs in Managing Big Data for Personalization and Customer Service Enhancement. *Journal of Contemporary Administration and Management (ADMAN)*, *2*(2), 569–575. https://doi.org/10.61100/adman.v2i2.208
21. Holbrook, M. B., & Hirschman, E. C. (1982). The Experiential Aspects of Consumption: Consumer Fantasies, Feelings, and Fun. *Journal of Consumer Research*, *9*(2). https://doi.org/10.1086/208906
22. Hossain, M. A., Akter, S., Yanamandram, V., & Wamba, S. F. (2023). Data-driven market effectiveness: The role of a sustained customer analytics capability in business operations. *Technological Forecasting and Social Change*, *194*, 122745. https://doi.org/10.1016/j.techfore.2023.122745
23. Hult, G. T. M., Morgeson Iii, F. V., Sharma, U., & Fornell, C. (2022). Customer satisfaction and international business: A multidisciplinary review and avenues for research. *Journal of International Business Studies*, *53*(8), 1695–1733. https://doi.org/10.1057/s41267-022-00546-2
24. Ingriana, A., Prajitno, G. G., & Rolando, B. (2024). *THE UTILIZATION OF AI AND BIG DATA TECHNOLOGY FOR OPTIMIZING DIGITAL MARKETING STRATEGIES*. *1*(1).
25. Itani, O. S., Kalra, A., & Rostami, A. (2024).

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

How does big data affect organizational financial performance in turbulent markets? The role of customer-linking and selling capabilities. *Technological Forecasting and Social Change*, *201*, 123221. https://doi.org/10.1016/j.techfore.2024.123221

26. Jiwat, R., & Zhang, Z. (Leo). (2022). Adopting big data analytics (BDA) in business-to-business (B2B) organizations – Development of a model of needs. *Journal of Engineering and Technology Management*, *63*, 101676. https://doi.org/10.1016/j.jengtecman.2022.101676
27. Justy, T., Pellegrin-Boucher, E., Lescop, D., Granata, J., & Gupta, S. (2023). On the edge of Big Data: Drivers and barriers to data analytics adoption in SMEs. *Technovation*, *127*, 102850. https://doi.org/10.1016/j.technovation.2023.102850
28. Klee, S., Janson, A., & Leimeister, J. M. (2021). How Data Analytics Competencies Can Foster Business Value– A Systematic Review and Way Forward. *Information Systems Management*, *38*(3), 200–217. https://doi.org/10.1080/10580530.2021.1894515
29. Lada, S., Chekima, B., Karim, Mohd. R. A., Fabeil, N. F., Ayub, M. S., Amirul, S. M., Ansar, R., Bouteraa, M., Fook, L. M., & Zaki, H. O. (2023). Determining factors related to artificial intelligence (AI) adoption among Malaysia's small and medium-sized businesses. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(4), 100144. https://doi.org/10.1016/j.joitmc.2023.100144
30. Le Dinh, T., Vu, M.-C., & Tran, G. T. C. (2025). Artificial Intelligence in SMEs: Enhancing Business Functions Through Technologies and Applications. *Information*, *16*(5), 415. https://doi.org/10.3390/info16050415
31. Lemon, K. N., & Verhoef, P. C. (2016). Understanding Customer Experience Throughout the Customer Journey. *Journal of Marketing*, *80*(6), 69–96. https://doi.org/10.1509/jm.15.0420
32. Lettner, N., Wilhelm, S., Güldenberg, S., & Güttel, W. (2022). Customers as knowledge partners in a digital business ecosystem: From customer analytics towards knowledge partnerships. *Journal of Digital Economy*, *1*(2), 130–140. https://doi.org/10.1016/j.jdec.2022.08.001
33. Liu, F., Yu, Y., Fang, Y., Zhu, M., Shi, Y., & Xiao, S. (Simon). (2024). Lean strategy in SMEs: Inventory leanness, operational leanness, and financial performance. *The Asian Journal of Shipping and Logistics*. https://doi.org/10.1016/j.ajsl.2024.02.003
34. Maroufkhani, P., Tseng, M.-L., Iranmanesh, M., Ismail, W. K. W., & Khalid, H. (2020). Big data analytics adoption: Determinants and performances among small to medium-sized enterprises. *International Journal of Information Management*, *54*, 102190. https://doi.org/10.1016/j.ijinfomgt.2020.102190
35. Micus, C., Schramm, S., Boehm, M., & Krcmar, H. (2023). Methods to analyze customer usage data in a product decision process:A systematic literature review. *Operations Research Perspectives*, *10*, 100277. https://doi.org/10.1016/j.orp.2023.100277
36. Mohamad Toha & Neng Julfa Habibah. (2023). MSME EMPOWERMENT AND DEVELOPMENT PROGRAM TO INCREASE CONSUMER SATISFACTION. *Sahwahita: Community Engagement Journal*, *1*(1), 26–39. https://doi.org/10.69965/sahwahita.v1i1.24
37. Mortati, M., Magistretti, S., Cautela, C., & Dell'Era, C. (2023). Data in design: How big data and thick data inform design thinking projects. *Technovation*, *122*, 102688. https://doi.org/10.1016/j.technovation.2022.102688
38. Motevalli, S. H., & Razavi, H. (n.d.). *Enhancing Customer Experience and Business Intelligence: The Role of AI-Driven Smart CRM in Modern Enterprises*.
39. Nasrollahi, M., Ramezani, J., & Sadraei, M. (2021). The Impact of Big Data Adoption on SMEs' Performance. *Big Data and Cognitive Computing*, *5*(4), 68. https://doi.org/10.3390/bdcc5040068
40. Oesterreich, T. D., Anton, E., Teuteberg, F., & Dwivedi, Y. K. (2022). The role of the social and technical factors in creating business value from big data analytics: A meta-analysis. *Journal of Business Research*, *153*, 128–149. https://doi.org/10.1016/j.jbusres.2022.08.028
41. Oh, D., Yoo, M. (Myongjee), & Lee, Y. (2019). A holistic view of the service experience at coffee franchises: A cross-cultural study.

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

International Journal of Hospitality Management, *82*, 68–81. https://doi.org/10.1016/j.ijhm.2019.03.022

42. Perdana, A., Lee, H. H., Arisandi, D., & Koh, S. (2022). Accelerating data analytics adoption in small and mid-size enterprises: A Singapore context. *Technology in Society*, *69*, 101966. https://doi.org/10.1016/j.techsoc.2022.101966
43. Perdana, A., Lee, H. H., Koh, S., & Arisandi, D. (2022). Data analytics in small and mid-size enterprises: Enablers and inhibitors for business value and firm performance. *International Journal of Accounting Information Systems*, *44*, 100547. https://doi.org/10.1016/j.accinf.2021.100547
44. Polas, M. R. H., Afshar Jahanshahi, A., Kabir, A. I., Sohel-Uz-Zaman, A. S. Md., Osman, A. R., & Karim, R. (2022). Artificial Intelligence, Blockchain Technology, and Risk-Taking Behavior in the 4.0IR Metaverse Era: Evidence from Bangladesh-Based SMEs. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(3), 168. https://doi.org/10.3390/joitmc8030168
45. Rana, M. I. C., Ahmad, M. Y., Kayser, K. A., Md Shahiduzzaman, & Kabir, M. F. (2025). Transforming Small Businesses Through Analytics: Boosting Sales, Customer Engagement, and Brand Value. *International Journal on Science and Technology*, *16*(1), 2272. https://doi.org/10.71097/IJSAT.v16.i1.2272
46. Rane, N. (2023). Enhancing Customer Loyalty through Artificial Intelligence (AI), Internet of Things (IoT), and Big Data Technologies: Improving Customer Satisfaction, Engagement, Relationship, and Experience. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4616051
47. Rautenbach, S., De Kock, I., & Grobler, J. (2022). DATA SCIENCE FOR SMALL AND MEDIUM-SIZED ENTERPRISES: A STRUCTURED LITERATURE REVIEW. *South African Journal of Industrial Engineering*, *32*(3). https://doi.org/10.7166/33-3-2797
48. Rogers, E. M. (1983a). *Diffusion of innovations* (3. ed). Free Press [u.a.].
49. Rogers, E. M. (1983b). *Diffusion of innovations* (3rd ed). Free Press ; Collier Macmillan.
50. Sakas, D. P., Reklitis, D. P., Terzi, M. C., & Glaveli, N. (2023). Growth of digital brand name through customer satisfaction with big data analytics in the hospitality sector after the COVID-19 crisis. *International Journal of Information Management Data Insights*, *3*(2), 100190. https://doi.org/10.1016/j.jjimei.2023.100190
51. Santolin, R. B., Hameed, H. B., Urbinati, A., & Lazzarotti, V. (2023). Exploiting circular economy enablers for SMEs to advance towards a more sustainable development: An empirical study in the post COVID-19 era. *Resources, Conservation & Recycling Advances*, *19*, 200164. https://doi.org/10.1016/j.rcradv.2023.200164
52. Shaik, A. S., Nazrul, A., Alshibani, S. M., Agarwal, V., & Papa, A. (2024). Environmental and economical sustainability and stakeholder satisfaction in SMEs. Critical technological success factors of big data analytics. *Technological Forecasting and Social Change*, *204*, 123397. https://doi.org/10.1016/j.techfore.2024.123397
53. Suryawijaya, T. W. E., & Wardhani, M. F. (2023). Tailoring the future of MSME marketing: A study on leveraging customer data for personalized experiences. *Implementasi Manajemen & Kewirausahaan*, *3*(1), 76–88. https://doi.org/10.38156/imka.v3i1.163
54. Sykora, M., Elayan, S., Hodgkinson, I. R., Jackson, T. W., & West, A. (2022). The power of emotions: Leveraging user generated content for customer experience management. *Journal of Business Research*, *144*, 997–1006. https://doi.org/10.1016/j.jbusres.2022.02.048
55. Theodorakopoulos, L., & Theodoropoulou, A. (2024). Leveraging Big Data Analytics for Understanding Consumer Behavior in Digital Marketing: A Systematic Review. *Human Behavior and Emerging Technologies*, *2024*(1), 3641502. https://doi.org/10.1155/2024/3641502
56. Verhoef, P. C., Lemon, K. N., Parasuraman, A., Roggeveen, A., Tsiros, M., & Schlesinger, L. A. (2009). Customer Experience Creation: Determinants, Dynamics and Management Strategies. *Journal of Retailing*, *85*(1), 31–41. https://doi.org/10.1016/j.jretai.2008.11.001
57. Vicario, G., & Coleman, S. (2020). A review of data science in business and industry and a future view. *Applied Stochastic Models in Business and Industry*, *36*(1), 6–18. https://doi.org/10.1002/asmb.2488

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

58. Werner, J., Beisswanger, P., Schürger, C., Klaiber, M., & Theissler, A. (2023). From Data to Wisdom: A Review of Applications and Data Value in the context of Small Data. *Procedia Computer Science*, *225*, 1251–1260. https://doi.org/10.1016/j.procs.2023.10.113
59. Wolniak, R. (2023). The application of business analytics in personalized customer experience. *Scientific Papers of Silesian University of Technology. Organization and Management Series*, *2023*(182), 613–629. https://doi.org/10.29119/1641-3466.2023.182.36
60. Yörük, R. (2025). Enhancing SME Operations with Machine Learning and Business Intelligence: A Case Study of Kolay.ai. *Journal of Data Analytics and Artificial Intelligence Applications*, *1*(1), 61–83. https://doi.org/10.26650/d3ai.1607791
61. Zastempowski, M., & Cyfert, S. (2021). Impact of entrepreneur's gender on innovation activities. The perspective of small businesses. *PLOS ONE*, *16*(10), e0258661. https://doi.org/10.1371/journal.pone.0258661
62. Zha, D., Marvi, R., & Foroudi, P. (2023). Synthesizing the customer experience concept: A multimodularity approach. *Journal of Business Research*, *167*, 114185. https://doi.org/10.1016/j.jbusres.2023.114185
63. Zulaikha, S., Mohamed, H., Kurniawati, M., Rusgianto, S., & Rusmita, S. A. (2025). CUSTOMER PREDICTIVE ANALYTICS USING ARTIFICIAL INTELLIGENCE. *The Singapore Economic Review*, *70*(04), 1009–1020. https://doi.org/10.1142/S0217590820480021