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| RESEARCH ARTICLE

Data-Driven Persona: How Business Intelligence Analytics Enhance Customer Experience for US Small and Medium Enterprises (SMEs)

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| ABSTRACT

This research focuses on the use of Business Intelligence (BI) analytics among small and medium-sized enterprises (SMEs) and how these analytics aid in tailoring interactions with customers improve loyalty metrics such as click-through rates (CTR), customer lifetime value (CLV), and repeat purchase rates. The study conducted a thematic analysis of journal articles, books, and conference papers with specific search strategies and inclusion criteria aimed at relevance within the SME framework. Key Thematic analysis points to four major strategies: segmentation and profiling capture numerous data points, personalized content generation, optimization of touchpoints within the customer journey, and measurable metrics improvements in loyalty through BI adoption. Implications: The study showcases implemented strategically that BI tools increase engagement facilitate active loyalty, thus improving performance, enhancing competitiveness of the SME. Additional empirical studies are necessary to confirm the findings across various SME industries, as well as devise strategies for SMEs that incorporate scalable and affordable BI solutions.

| KEYWORDS

Business Intelligence, Customer Experience, SMEs, Personalization, Customer Loyalty, CTR, CLV, Repeat Purchase Rates.

| ARTICLE INFORMATION

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1. Introduction

Customer experience is especially important for the sustainable development of small and medium-sized enterprises (SMEs) in today's industries. Improving customer engagement and loyalty requires more sophisticated strategies that evolve with consumer demands and expectations (Ijomah et al., 2024). Business Intelligence (BI) tools enable SMEs to gather, analyse, and apply customer data to create personalized offers and messages which, in turn, improves customer loyalty and sales (Maroufkhani et al., 2020; Shabbir & Gardezi, 2020).

The expansion of cloud BI services has lowered expenses and increased availability, making advanced analytics accessible to smaller SMEs (Hamidinava et al., 2021). This is however not the case for all SMEs. BI has unevenly penetrated different SME sizes, with larger SMEs (100–999 employees) far more likely to adopt BI (54%–62%) than very small enterprises (8%–18%) (Agostino et al., 2013; Bi, 2020), illustrated in Graph 1. The purpose of this paper is to study BI-driven personalization strategies aimed to

enhance customer experiences in US SMEs, specifically through click-through rates (CTR), customer lifetime value (CLV), and repeat purchase rate.

2. Problem Statement

The growing significance placed on customer-centric strategies has yet to reach small and medium-sized enterprises in the United States, many of whom do not have engagement models that strategically leverage Business Intelligence (BI) analytics (Maroufkhani et al., 2020; Rezvi et al., 2025). Despite the effectiveness of BI instruments in making decisions and targeting customers, there is still little understanding of analysing the BI metrics of customer loyalty, click-through rate (CTR), customer lifetime value (CLV), and repeat purchases (Ijomah et al., 2024; Shabbir & Gardezi, 2020). In small businesses, the pragmatic use of BI is impeded by a lack of adequate resources and skills, as well as a low appreciation of its role in improving personal experience customization (Hamidinava et al., 2021).

3. Purpose and Objectives of the Study

Through a thematic analysis of extant literature, this study aims to examine the approaches adopted by small and medium-sized enterprises (SMEs) in the United States to leverage Business Intelligence (BI) analytics for strategic personalization of customer engagement interactions towards enhancing performance metrics like click-through rate (CTR), customer lifetime value (CLV), and repeat purchase rate.

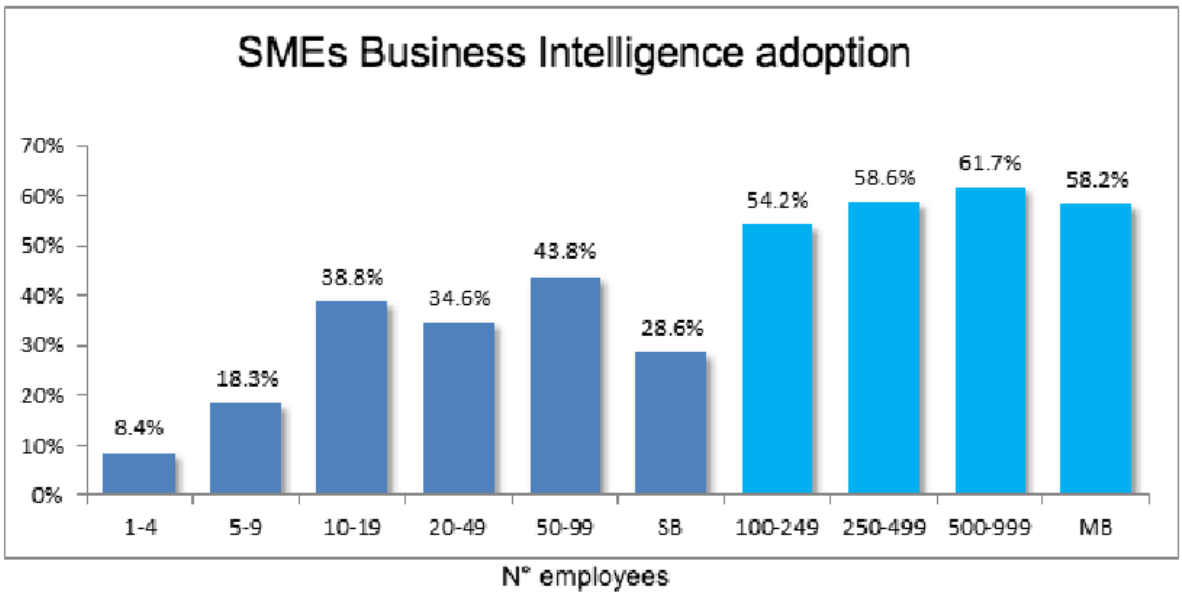
Key objectives are outlined as below:

- To investigate how SMEs use BI analytics to tailor offers, content, and messaging
- To assess impact on CTR, CLV, and repeat purchase rates
- To propose implementation strategies based on thematic literature analysis

4. Literature Review

Business Intelligence systems aid SMEs to optimize decision making in the business as Lateef and Keikhosrokiani (2023) suggest. SMEs have traditionally ignored BI systems due to their complexity and costs but Ragazou et al. (2023) argues that cloud-based solutions now provides scalable and affordable options to suit their operational model. Although cloud-based solutions provide better accessibility, many SMEs are still reluctant to fully adopt these systems due to fears of resource constraints and complex technology. Chen and Lin (2021) emphasize that the dynamic capabilities provided by BI, especially motivated by insights and transforming them into actions, are crucial in retaining competitive edge in the market.

Graph 1: SMEs Business Intelligence Adoption



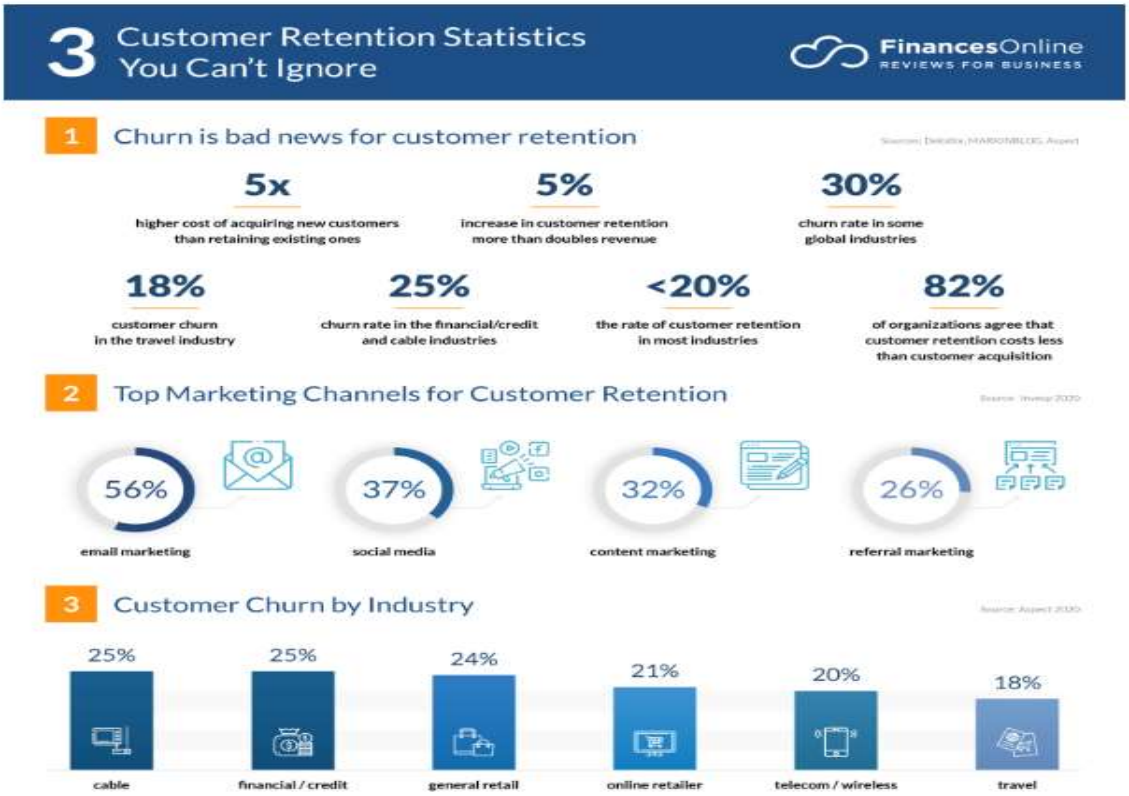
(Agostino et al., 2013)

Data based personas allow SMEs to forecast customer needs and patterns better as Rozmi et al. (2021) explains. SMEs with advanced data capabilities tend to operationally align better with customer needs, improving responsiveness as highlighted by

Hautala-Kankaanpää (2023). Simply put, performance improves with data availability, however, transforming data into actionable instructions requires sophisticated supply chain and data fusion capabilities which remain difficult for many technically ill-equipped SMEs (Hoang & Bui, 2023; Rezvi et al., 2025).

Customer experience remains one of the most important factors influencing the sustainable growth of SMEs in the current business climate. Business Intelligence offers SMEs the option of tailoring promotional messages and products, thereby increasing loyalty and sales (Maroufkhani et al., 2020; Shabbir & Gardezi, 2020). However, the adoption rates of these technologies differ significantly according to size. Larger SMEs, 100-999 employees, have adoption rates of 54%-62%. Very small enterprises lag behind, with only 8%-18% adoption rates (Agostino et al., 2013). This is shown in Graph 1.

Graph 2: 3 Customer Retention Strategies You Can't Ignore



(Finance Online, 2025)

The implementation of personalization strategies enables firms to enrich customer experience, and improve customer retention (Lateef & Keikhosrokiani, 2023). According to Chatterjee et al. (2022), AI-equipped CRM systems enable SMEs to provide personalized engagements with customers, though consistent 'technology turbulence' often disrupts continuity. Ugbebor (2024), on the other hand, assumes that intelligent cloud solutions are able to provide scalable alignment with SME capabilities for tailored personalization. As shown in Graph 2, Companies that focus on personalization via email marketing and CRM greatly improve customer retention and, as a result, profitability and long-term loyalty strengthen.

Business intelligence (BI) systems and BI tools are evaluated based on their effectiveness for organizations. Metrics such as customer experience, CTR, CLV, and repeat purchases directly influence the evaluation. Almazmomi et al. (2022) established a correlation between strong analytics capabilities and improved innovation and engagement outcomes. These systems require a cohesive IT architecture which Maroufkhani et al (2023) cite as an impediment on SMEs.

Practical challenges arise from financial and technical constraints (Hamidinava et al., 2021; Omrani et al., 2022), but the BI framework demonstrates marked improvement in loyalty and operational performance. Bi and other researchers focus primarily on analysing regions yet to legislate advanced BI frameworks, seldom put more critical focus on CTR, CLV, or repeat purchase metric increases within SMEs. This is the gap this paper aims to address through focused thematic analysis.

5. Methodology

The secondary data comprised journals, conference papers and academic books relating to the adoption of Business Intelligence (BI) in SMEs which were thematically analysed in this study. Subsequent to Braun and Clarke's reflexive thematic analysis (Byrne, 2022), the data derived from BI customer experience usage were coded and fleshed out into holistic themes. Google Scholar served as the primary database with search queries as "BI adoption SMEs," "Customer personalization BI," "customer loyalty metrics SMEs." The inclusion parameters were publications starting from the year 2020 focusing on BI in SMEs, while disengaged outdated customer engagement studies were excluded.

6. Results/Findings

Theme	Source 1	Source 2	Source 3
Data segmentation and customer profiling	"Data-driven insights are vital for maintaining a competitive edge where BI systems play a crucial role" (Mmeje et al., 2024).	"The results show that to benefit from the data capability, SMEs require a certain level of SCC to extract the value" (Hautala-Kankaanpää, 2023).	"Small and medium-sized enterprises (SMEs) are increasingly leveraging marketing analytics to enhance decision-making and improve performance" (Ijomah et al., 2024).
Personalized content generation through BI insights	"Providing a single unified framework of BDA adoption for SMEs enables them to appreciate the importance of most influential elements" (Maroufkhani et al., 2020).	"Business analytics capability drives a data-driven culture and enables customer-centred innovation" (Almazmomi et al., 2022).	"Cloud-based ERP and BI system integration enables SMEs to introduce better values attached to decision making" (Ugbebor, 2024).
Optimization of customer journey touchpoints	"Simulation techniques can play in prescriptive analysis" (Rabia & Bellabdaoui, 2020).	"The study results show that there are direct and high-intensity cumulative positive effects among the structural components" (Chen & Lin, 2021).	"The fuzzy Delphi Method has been applied for parameter validation purposes" (Hamidinava et al., 2021).
Impact on loyalty metrics (CTR, CLV, repeat purchases)	"The results indicated that the ABDA had a positive and significant impact on OP" (Shabbir & Gardezi, 2020).	"The study finds that an AI-embedded CRM system has a significant positive impact towards B2B relationship satisfaction and firm performance" (Chatterjee et al., 2022).	"The results of ISM revealed the impact of SME characteristics on BI critical success factors and adoptability" (Hamidinava et al., 2021).

Thematic analysis shed light on the specific strategies that Small and Medium-sized Enterprises (SMEs) use through Business Intelligence (BI) tools. Customer data segmentation and customer profiling is one of the most important outcomes of BI within SMEs because it enhances customer need fulfilment. Data-driven insights, as identified by Mmeje et al. (2024), are vital to sustaining competitive advantage and allow profiling based on purchasing habits and preferences. It is not enough to have data capabilities. Hautala-Kankaanpää (2023) showed that SMEs need to have strong supply chain capabilities (SCC) in addition to data capabilities to gain operational IT benefits. This indicates that without comprehensive organizational competencies, attempts at segmentation are unlikely to drive improvement, underscoring the necessity to strategically realign internal resources (Hautala-Kankaanpää, 2023).

The creation of personalized content through Business Intelligence (BI) insights is yet another transformative development for SMEs. Maroufkhani et al. (2020) argued that having a single cohesive structure to operate under big data analytics together with big data perception as high-tech, allows SMEs to better appreciate personalization from technological, organizational, and environmental factors. Nonetheless, efforts toward personalization must be accompanied by a change in organizational culture. As Almazmomi et al. (2022) pointed out, a data-driven culture is critical to effectively foster customer-centred innovation. If embedding BI practices is not integrated into routine decision-making, SMEs risk shallowing the impact of their personalization efforts, and subsequently customer loyalty stagnated growth (Almazmomi, 2022).

Customer's journey touchpoints optimization is equally enabled by predictive and prescriptive analytics, which allow anticipating customer needs and reducing churn rate. Rabia and Bellabdaoui (2020) emphasized the importance of simulation techniques and particularly what-if analysis, in tracking the effects of strategic decisions on customer journeys. Still, touchpoint optimization is a by-product of BI systems dynamic capabilities' cumulative effects. Chen and Lin (2021) confirmed the consistency of a

cohesive BI system yielding higher synergy among its components to decisively strengthen the decision-making effectiveness. This suggests that fragmented or siloed approaches to implementing BI with other customer engagement touchpoints executed disperse BI voids may undermine the overall enhancement of customer experience across interactions (Chen and Lin, 2021).

Deploying business intelligence (BI) tools effectively optimizes loyalty metrics like click-through rates (CTR), customer lifetime value (CLV), and repeat purchases. According to Shabbir and Gardezi (2020), the use of big data analytics markedly enhances business performance, indirectly boosting customer loyalty by improving the organization's service standards. However, Chatterjee et al. (2022) showed that AI-embedded CRM systems impact relationship satisfaction and firm performance more directly, implying that smart investment in CRM integration could maximize returns on loyalty-centred BI strategies (Chatterjee et al., 2022).

7. How We Can Implement It

To effectively implement BI tools, SMEs must undertake a thorough internal check-up whilst identifying applicable BI systems commensurate with their needs, complexities, and envisaged cloud-enabled scalability. Ugbebor (2024) stressed that Intelligent Cloud offerings, inclusive of Business Intelligence integration, advance analytics for SMEs at a lower cost. Still, there is a need for SMEs to strike a fine balance between cost-effective and robust solutions that sustain long-term growth to support the size and complexity of data. Data literacy along with analytics skills transfer is key for sustainability, as Hoang and Bui (2023) identified that leadership competencies greatly impact the mid-stage transitions of successful BI adoptions. SMEs, without training tailored to their BI tools, run the risk of making ill-informed decisions centred on misconceived BI outputs (Hoang & Bui, 2023).

The incorporation of customer feedback loops into marketing service provides for fluid adaptations of the latter's strategies through BI. According to Ijomah et al (2024), analytics of feedback received on real-time basis remarkably improves performance targeting and campaign personalization for SMEs. However, SMEs need to satisfy financial limits; therefore, they must ensure that methods for feedback data collection are automated and easy so that time-strapped resources are not overtaxed. A pertinent illustration from Hautala-Kankaanpää (2023) reported that SMEs with optimized data segmentation paired with operational change responsive strategies achieved enhanced loyalty metrics demonstrating the extent of impact that operationalizing BI, action loops, and insight alignment can produce to business growth (Hautala-Kankaanpää, 2023).

8. Conclusion

The results indicated that the SME's business intelligence helps them to effectively enhance customer loyalty, automate interactions, and personalize communication and significantly improves loyalty CTR, CLV, and repeat purchases. These capabilities are essential in bolstering competitiveness within numerous SME's in the market due to the fundamental reality of an ever-increasing data driven world. However, the study's focus on secondary sources, along with specific geographic and sectoral contexts, represents a constraint on its wider applicability. Further research should focus on SMEs across various industries to test and refine these results. In addition, the BI and SME customer experience relationship demands longitudinal studies to reveal the impact and growing trends of BI adoption on organisational growth over extended periods.

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