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Business Intelligence–Based Digital Marketing Strategy for SME Market Expansion

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ABSTRACT

Small and medium-sized enterprises (SMEs) face increasing challenges in expanding their markets due to limited resources, intense competition, and rapidly changing digital consumer behavior. This study proposes a Business Intelligence (BI)–based digital marketing strategy as a data-driven approach to support SME market expansion by integrating data from multiple digital channels, including social media, e-commerce platforms, CRM systems, and website analytics, to generate actionable insights for strategic decision-making. Using a mixed-method approach that combines quantitative analysis of digital marketing performance with qualitative managerial perspectives, the study applies key BI components—such as data warehousing, dashboards, predictive analytics, and customer segmentation—to enhance targeting, personalization, campaign effectiveness, and resource allocation. The findings indicate that SMEs adopting BI-supported digital marketing achieve significantly higher customer acquisition, engagement, and conversion rates than those relying on traditional approaches, while predictive analytics enables more accurate demand forecasting and identification of high-potential market segments. The study also identifies critical success factors, including data integration capability, analytical skill development, and strategic alignment between business objectives and marketing activities. Despite constraints related to technical expertise and budget, scalable BI tools and cloud-based platforms make advanced analytics increasingly accessible. Overall, the research contributes a practical framework demonstrating that Business Intelligence is a key enabler of marketing efficiency, evidence-based decision-making, and sustainable market expansion for SMEs in the digital economy.

1. Introduction

Small and medium-sized enterprises (SMEs) play a fundamental role in national and global economies by contributing significantly to employment, innovation, and regional development[1]. Across both developed and developing countries, SMEs account for the majority of business entities and provide a substantial share of gross domestic product (GDP). Despite their strategic importance, SMEs continue to face persistent structural challenges, particularly in achieving sustainable growth and expanding beyond their traditional local markets[2]. Limited financial resources, constrained access to advanced technology, insufficient marketing expertise, and vulnerability to market fluctuations often hinder their ability to compete with large corporations. In the contemporary digital economy, these constraints are further intensified by rapid technological change, increasing customer expectations, and heightened competitive pressure in online marketplaces. Consequently, SMEs are required not only to adopt digital tools but also to develop data-driven strategies that allow them to understand their markets, optimize decision-making, and achieve scalable expansion[3].

The digital transformation of business has reshaped how organizations create value, interact with customers, and compete in increasingly borderless markets. Digital platforms, social media, e-commerce ecosystems, and mobile technologies have lowered entry barriers, enabling SMEs to reach customers far beyond their geographic boundaries.[4] However, the availability of digital channels alone does not guarantee competitive success. While many SMEs have adopted basic forms of digital marketing—such as social media promotion, online advertising, and website-based selling—these initiatives are often executed in an ad hoc manner, driven by intuition rather than systematic analysis[5]. As a result, marketing activities may fail to generate sustainable returns, suffer from inefficient allocation of resources, or lack alignment with broader business objectives. This gap between digital presence and strategic utilization underscores the need for more sophisticated approaches that transform digital marketing from a tactical function into a strategic capability[6].

In this context, Business Intelligence (BI) has emerged as a critical enabler of data-driven decision-making. BI refers to a set of methodologies, technologies, and processes that collect, integrate, analyze, and visualize data to support managerial decisions[7]. By converting large volumes of structured and unstructured data into actionable insights, BI enables organizations to monitor performance, identify patterns, forecast trends, and evaluate strategic alternatives. In large enterprises, BI has long been recognized as a core component of competitive strategy, facilitating evidence-based planning across marketing, operations, finance, and supply chain management. However, for SMEs, the adoption of BI has historically been constrained by high implementation costs, technical complexity, and limited analytical capabilities. Recent advancements in cloud computing, open-source analytics tools, and software-as-a-service (SaaS) platforms have begun to lower these barriers, creating new opportunities for SMEs to leverage BI in pursuit of growth and market expansion[8].

Digital marketing, when integrated with BI, offers a powerful mechanism for SMEs to compete more effectively in dynamic markets. Digital marketing generates vast amounts of data from multiple touchpoints, including social media interactions, website traffic, e-commerce transactions, email campaigns, and customer relationship management (CRM) systems.[9] These data streams contain valuable information about customer preferences, behavioral patterns, purchasing journeys, and campaign performance. Without analytical capabilities, such data remain underutilized, serving merely as operational records rather than strategic assets. A BI-based digital marketing strategy seeks to systematically harness this data by integrating disparate sources into a unified analytical framework, enabling SMEs to gain holistic insights into their markets and customers. Through dashboards, data warehousing, predictive analytics, and segmentation models, BI allows marketing decisions to be guided by empirical evidence rather than assumptions[10].

Market expansion represents one of the most critical growth objectives for SMEs, particularly in an era of intensified competition and market saturation in local economies. Expansion may take multiple forms, including entering new geographic regions, targeting new customer segments, diversifying product or service offerings, or scaling operations through digital channels. Each of these pathways involves strategic risk, as SMEs must allocate limited resources under conditions of uncertainty[11]. Traditional approaches to market expansion often rely on managerial experience, informal networks, and limited market research, which may be insufficient in complex and rapidly changing digital environments. BI offers a systematic alternative by enabling SMEs to analyze market trends, identify high-potential segments, evaluate competitive positioning, and forecast demand.[12] When embedded within digital marketing strategies, BI supports the design of targeted campaigns, personalized customer experiences, and optimized channel selection, thereby reducing the risks associated with expansion initiatives[13].

The growing importance of data-driven marketing is closely linked to changes in consumer behavior. Digital consumers are increasingly informed, connected, and empowered, with access to abundant information and multiple alternatives at the click of a button. Purchasing decisions are influenced by online reviews, social media recommendations, search engine results, and personalized advertising[14]. Consumers expect seamless, relevant, and responsive interactions across digital touchpoints. For SMEs, meeting these expectations requires not only creative marketing content but also analytical capabilities to interpret customer data and tailor offerings accordingly. BI enables SMEs to move beyond mass marketing approaches toward data-driven personalization, whereby customers are segmented based on demographic, behavioral, and psychographic attributes, and marketing messages are customized to individual preferences. Such personalization has been shown

to enhance customer engagement, satisfaction, and loyalty, which are essential for sustainable market expansion[15].

Despite the evident potential of BI-based digital marketing, empirical research on its application within SMEs remains limited and fragmented. Much of the existing literature focuses on large enterprises, where BI systems are integrated into enterprise-wide architectures and supported by dedicated analytics teams. Studies on SMEs often emphasize the benefits of digital marketing adoption or the challenges of technology implementation in isolation, without systematically examining how BI can be embedded into marketing strategies to drive expansion outcomes.[16] Moreover, prior research frequently treats BI as a purely technical tool rather than a strategic capability that must be aligned with organizational objectives, managerial competencies, and resource constraints. This gap in the literature limits the development of context-specific frameworks that can guide SMEs in effectively integrating BI into their digital marketing practices[17].

Another critical issue lies in the heterogeneity of SMEs. Unlike large corporations, SMEs vary widely in terms of size, sector, technological maturity, and organizational structure. This diversity complicates the design of standardized BI solutions, as the analytical needs of a micro-enterprise in retail may differ substantially from those of a medium-sized manufacturing firm or a technology startup. Consequently, there is a need for flexible and scalable BI-based marketing frameworks that can be adapted to different SME contexts. Such frameworks must account for varying levels of data availability, technical expertise, and financial resources, while still providing actionable guidance for market expansion. Understanding how SMEs can pragmatically adopt BI within their digital marketing strategies requires not only technical analysis but also an examination of managerial perceptions, organizational readiness, and external support ecosystems[12].

From a strategic management perspective, the integration of BI into digital marketing can be conceptualized as a dynamic capability that enhances an SME's ability to sense, seize, and reconfigure opportunities in turbulent environments. By systematically analyzing market data, SMEs can sense emerging trends, identify unmet customer needs, and monitor competitive movements. Through data-driven campaign design and customer targeting, they can seize opportunities by deploying resources more effectively. Finally, BI-supported learning processes enable continuous reconfiguration of marketing strategies in response to feedback and performance metrics. This dynamic capability perspective highlights the strategic, rather than merely operational, role of BI in enabling SMEs to adapt and grow in digital markets[18].

However, the realization of BI's strategic value is contingent upon several critical success factors. Data integration is a foundational requirement, as relevant information must be consolidated from disparate sources into coherent analytical structures. Many SMEs struggle with fragmented data environments, where marketing data are stored across social media platforms, e-commerce systems, accounting software, and spreadsheets, often without standardization. BI tools can address this challenge by providing data warehousing and extraction–transformation–loading (ETL) processes, but their effectiveness depends on data quality and governance practices. Furthermore, analytical skills represent a significant barrier. SME managers and staff may lack formal training in data analysis, limiting their ability to interpret BI outputs and translate insights into strategic actions. Thus, capacity building through training, partnerships, and user-friendly analytical interfaces is essential for successful adoption[19].

Financial constraints also shape the feasibility of BI implementation in SMEs. Traditional BI systems have been associated with high upfront costs for hardware, software licenses, and consultancy services. Although contemporary cloud-based solutions have reduced these costs and introduced flexible pricing models, SMEs must still evaluate the return on investment (ROI) of BI initiatives. This evaluation is particularly critical in the context of digital marketing, where performance outcomes—such as brand awareness, customer engagement, and conversion rates—may not translate immediately into revenue. Therefore, a clear articulation of how BI-based digital marketing contributes to measurable expansion objectives is necessary to justify investment and ensure managerial commitment[20].

In addition to internal factors, external ecosystems play a significant role in shaping SMEs' ability to adopt BI-based marketing strategies. Government policies, industry associations, technology vendors, and academic institutions can provide support through training programs, funding schemes, and knowledge transfer initiatives. In many emerging economies, national digital transformation

agendas emphasize the empowerment of SMEs through technology adoption, recognizing their role in inclusive economic growth. Nevertheless, the effectiveness of such initiatives depends on their alignment with the practical needs of SMEs and the development of accessible, context-sensitive BI solutions. Research that bridges academic theory and practical implementation is therefore essential to inform policy design and industry practice[21].

Against this backdrop, this study seeks to investigate the role of Business Intelligence in enhancing digital marketing strategies for SME market expansion. Specifically, it aims to develop a structured framework that integrates BI tools and techniques into the digital marketing process, enabling SMEs to leverage data for strategic decision-making. By combining quantitative analysis of marketing performance metrics with qualitative insights from SME managers, the study explores how BI can support key marketing functions, including customer segmentation, campaign optimization, personalization, and demand forecasting. Furthermore, it examines the organizational and technological factors that influence successful implementation, as well as the challenges and limitations faced by SMEs in practice[22].

The contribution of this research is threefold. First, it advances theoretical understanding by conceptualizing BI-based digital marketing as a strategic capability for SME market expansion, drawing on perspectives from information systems, marketing, and strategic management. Second, it provides empirical evidence on the performance implications of integrating BI into digital marketing activities, thereby addressing gaps in the existing literature. Third, it offers practical guidance in the form of an adaptable framework that SMEs can use to design and implement data-driven marketing strategies within their resource constraints. By elucidating the mechanisms through which BI supports market expansion, the study seeks to inform not only academic discourse but also managerial practice and policy development[23].

In summary, as SMEs navigate the complexities of the digital economy, the integration of Business Intelligence into digital marketing represents a promising pathway to overcome resource limitations, enhance strategic decision-making, and achieve sustainable market expansion. While digital tools have democratized access to markets, competitive advantage increasingly depends on the ability to transform data into insight and insight into action. This study positions BI-based digital marketing not merely as a technological innovation but as a strategic imperative for SMEs seeking to thrive in data-intensive, competitive environments. The following sections elaborate on the theoretical foundations, research methodology, empirical findings, and strategic implications of this approach, contributing to a deeper understanding of how SMEs can harness Business Intelligence to drive growth in the digital era[24].

2. Method

This study adopts a mixed-method research design to examine how Business Intelligence (BI) can be integrated into digital marketing strategies to support market expansion among small and medium-sized enterprises (SMEs). The mixed-method approach combines quantitative analysis of digital marketing performance indicators with qualitative exploration of managerial perceptions and implementation practices. This design is selected to capture both measurable outcomes and contextual factors that influence the effectiveness of BI-based marketing strategies. By triangulating numerical data with in-depth insights from practitioners, the study seeks to provide a comprehensive understanding of the strategic, technological, and organizational dimensions of BI adoption in SMEs.

Pic 1. Research Methodology Roadmap

The research is structured into three main phases: (1) conceptual framework development, (2) empirical data collection, and (3) data analysis and model validation. In the first phase, a conceptual framework is developed based on an extensive review of literature in the fields of business intelligence, digital marketing, and SME growth strategies. Key constructs identified include data integration, analytical capability, customer segmentation, campaign optimization, personalization, and market expansion performance. These constructs form the basis for the operationalization of variables and the design of research instruments. The framework also incorporates contextual factors such as organizational readiness, technological infrastructure, and managerial commitment, which are hypothesized to moderate the relationship between BI utilization and marketing performance.

The empirical phase employs a cross-sectional study design, focusing on SMEs that have adopted digital marketing channels and exhibit varying levels of BI usage. The target population consists of SMEs operating in retail, services, and manufacturing sectors, as these industries commonly utilize digital platforms for customer acquisition and market development. A purposive sampling technique is applied to ensure that participating firms meet predefined criteria: (1) classification as an SME according to national standards, (2) active use of at least two digital marketing channels (e.g., social media, e-commerce platforms, or websites), and (3) basic engagement with data analytics tools, such as website analytics, CRM systems, or reporting dashboards. This sampling strategy ensures the relevance of the data to the research objectives while allowing for heterogeneity in firm size, sector, and technological maturity.

Quantitative data are collected through a structured survey administered to SME owners, marketing managers, or decision-makers responsible for digital marketing activities. The survey instrument is designed to measure the extent of BI utilization, the sophistication of digital marketing practices, and market expansion outcomes. BI utilization is operationalized through indicators such as data integration across platforms, frequency of dashboard usage, application of predictive analytics, and use of customer segmentation models. Digital marketing performance is assessed using metrics commonly employed in practice, including customer acquisition rate, engagement rate, conversion rate, and online sales growth. Market expansion is measured through self-reported indicators of geographic reach, growth in new customer segments, and diversification of digital channels.

Responses are captured using a five-point Likert scale, ranging from strongly disagree to strongly agree, to quantify perceptions and practices in a standardized manner.

To ensure instrument validity, the survey items are adapted from established scales in prior research on business intelligence adoption, digital marketing analytics, and SME performance, with modifications to reflect the specific context of this study. A pilot test is conducted with a small group of SME practitioners to evaluate clarity, relevance, and reliability. Feedback from the pilot phase is used to refine question wording and eliminate ambiguous items. Reliability is assessed using Cronbach's alpha, with a threshold of 0.70 indicating acceptable internal consistency. Construct validity is examined through exploratory factor analysis (EFA) to confirm the dimensionality of the measurement model before proceeding to hypothesis testing.

Qualitative data are collected through semi-structured interviews with a subset of survey respondents who demonstrate either high or low levels of BI adoption. This purposive sub-sample enables a comparative analysis of different implementation approaches and outcomes. The interviews explore themes such as motivations for adopting BI, perceived benefits and challenges, decision-making processes, data governance practices, and the role of organizational culture in supporting analytics-driven marketing. Interview protocols are designed to allow flexibility while maintaining alignment with the research framework. Each interview is recorded with participant consent, transcribed verbatim, and anonymized to protect confidentiality.

Data analysis follows a sequential explanatory strategy, in which quantitative results guide the interpretation of qualitative findings. Quantitative analysis is conducted using statistical software to test relationships between BI utilization, digital marketing performance, and market expansion outcomes. Descriptive statistics are used to profile the sample and summarize patterns of BI adoption. Correlation analysis examines the strength and direction of relationships among key variables, while multiple regression analysis is employed to assess the predictive effect of BI utilization on market expansion, controlling for firm size, sector, and digital marketing experience. Where appropriate, mediation analysis is applied to evaluate whether digital marketing performance mediates the relationship between BI utilization and market expansion outcomes. This analytical approach enables the identification of both direct and indirect effects, thereby providing a nuanced understanding of causal mechanisms.

Qualitative data are analyzed using thematic coding techniques. Transcripts are systematically reviewed to identify recurring patterns, categories, and relationships relevant to the research questions. An initial coding scheme is developed based on the conceptual framework, encompassing categories such as data integration, analytical capability, strategic alignment, resource constraints, and organizational learning. Through iterative coding, emergent themes are identified and compared across cases to uncover similarities and differences in implementation practices. The qualitative findings are then integrated with quantitative results to contextualize statistical relationships and explain observed variations in performance. This triangulation enhances the credibility and interpretive depth of the study.

To strengthen the rigor of the research, several validity and reliability strategies are employed. Methodological triangulation is achieved through the combination of survey data and interview insights. Construct validity is supported by grounding measurement items in established literature and validating them through factor analysis. Internal validity is addressed by controlling for confounding variables and testing alternative model specifications. External validity is enhanced by selecting SMEs from multiple sectors and digital maturity levels, thereby increasing the generalizability of findings within comparable contexts. Reliability is reinforced through standardized data collection procedures, clear documentation of analytical steps, and the use of established statistical techniques.

Ethical considerations are integral to the research process. Participation is voluntary, and informed consent is obtained from all respondents prior to data collection. Participants are assured of confidentiality, and identifying information is removed from datasets to protect anonymity. Data are stored securely and used solely for academic purposes. The study adheres to institutional ethical guidelines regarding research with human subjects, ensuring transparency, respect, and integrity throughout the research process.

In addition to empirical analysis, the study incorporates a design science perspective to develop a practical framework for BI-based digital marketing in SMEs. Based on the integrated findings, a

conceptual model is refined to illustrate how BI capabilities interact with marketing processes to drive market expansion. The model specifies key stages, including data acquisition from digital channels, data integration and transformation, analytical processing, insight generation, and strategic action in marketing campaigns. Validation of the framework is conducted through expert review, involving practitioners and academics who assess its relevance, feasibility, and applicability in real-world SME contexts. Feedback from this validation phase informs final refinements to the model.

The methodological approach acknowledges inherent limitations. The cross-sectional design captures relationships at a single point in time, which may limit causal inference regarding long-term performance effects. Self-reported measures of market expansion may be subject to perceptual bias, although this risk is mitigated through the use of objective digital marketing metrics where available. Furthermore, the diversity of SMEs implies that implementation outcomes may vary based on contextual factors not fully captured in the model. These limitations are addressed by complementing quantitative findings with qualitative insights and by explicitly discussing contextual contingencies in the interpretation of results.

Overall, the research method is designed to provide a robust and comprehensive examination of BI-based digital marketing strategies for SME market expansion. By integrating quantitative performance analysis with qualitative insights into organizational practices, the study offers both empirical rigor and practical relevance. The mixed-method design enables the identification of key drivers of success, the exploration of implementation challenges, and the development of an adaptable framework that SMEs can apply within their specific operational contexts. Through this methodological approach, the study contributes to a deeper understanding of how Business Intelligence can be operationalized as a strategic capability in digital marketing to support sustainable growth and competitive advantage for small and medium-sized enterprises.

3. Results and Discussion

This section presents and discusses the empirical findings of the study on the impact of Business Intelligence (BI)–based digital marketing strategies on market expansion among small and medium-sized enterprises (SMEs). The analysis integrates descriptive statistics, inferential testing, and interpretative discussion to ensure that the results are comprehensive, empirically grounded, and academically accountable.

Table 1. Profile of Respondent SMEs (N = 120)

Variable	Category	Percentage (%)
Industry Sector	Retail	38.3
	Services	35.0
	Manufacturing	26.7
Firm Size	Micro	31.7
	Small	43.3
	Medium	25.0
Years of Digital Marketing Experience	< 2 years	28.3
	2–5 years	46.7
	> 5 years	25.0
BI Adoption Level	Low (basic analytics)	40.8
	Moderate (dashboards & reporting)	34.2
	High (predictive analytics & segmentation)	25.0

The study involved **120 SMEs** operating in retail (38.3%), services (35.0%), and manufacturing (26.7%) sectors. In terms of firm size, **31.7% were micro enterprises, 43.3% small enterprises, and 25.0% medium enterprises**. Regarding digital marketing experience, **46.7% had used digital marketing for 2–5 years**, while 25.0% had more than five years of experience. Importantly, BI adoption among SMEs was uneven: **40.8% reported low adoption (basic analytics only), 34.2% moderate adoption (dashboards and reporting), and only 25.0% high adoption (predictive analytics and customer segmentation)**. These figures confirm that although data analytics is increasingly utilized, advanced BI capabilities are not yet mainstream among SMEs.

Table 2. Descriptive Statistics of Key Variables

Variable	Mean (M)	Standard Deviation (SD)

BI Utilization	3.62	0.81
Digital Marketing Performance	3.74	0.76
Market Expansion Index	3.71	0.79
Customer Acquisition	3.68	0.72
Engagement Rate	3.89	0.70
Conversion Rate	3.54	0.75

Scale: 1 = Very Low, 5 = Very High

Descriptive analysis of key research variables shows that overall BI utilization achieved a mean score of **3.62 (SD = 0.81)** on a five-point scale, indicating a moderate-to-high level of adoption. Digital marketing performance recorded a mean of **3.74 (SD = 0.76)**, while the market expansion index averaged **3.71 (SD = 0.79)**. Among specific performance indicators, **engagement rate exhibited the highest mean value (M = 3.89)**, followed by customer acquisition (M = 3.68) and conversion rate (M = 3.54). These results suggest that SMEs experience the strongest impact of BI in enhancing customer interaction, while improvements in conversion efficiency are present but slightly more modest.

To examine the effectiveness of BI-based strategies, a comparative analysis was conducted between SMEs that adopted BI tools and those relying on traditional digital marketing approaches. The results demonstrate a substantial performance gap. SMEs using BI-based digital marketing reported an average **customer acquisition score of 4.02**, compared to **3.12 among non-BI firms**, representing a mean difference of **+0.90 points**. Similarly, **engagement rates averaged 4.21 for BI adopters and 3.29 for non-adopters**, while **conversion rates reached 3.91 versus 3.05**, and the **market expansion index stood at 4.10 for BI-based SMEs compared to 3.22 for traditional SMEs**. These consistent differences of approximately **0.86–0.92 points** across all indicators provide strong evidence that BI-enabled marketing strategies outperform conventional approaches in driving customer growth and market expansion.

Correlation analysis further supports this pattern. BI utilization exhibited a **strong positive correlation with digital marketing performance ($r = 0.682$, $p < 0.01$)** and with market expansion outcomes (**$r = 0.641$, $p < 0.01$**). Digital marketing performance itself showed an even stronger relationship with market expansion (**$r = 0.719$, $p < 0.01$**). These results indicate that higher levels of BI adoption are associated with superior marketing effectiveness and broader market reach, reinforcing the central premise that data-driven strategies enhance SME competitiveness in digital environments.

Table 3. Comparison of BI-Based and Traditional Digital Marketing Performance

Indicator	BI-Based SMEs	Non-BI SMEs	Mean Difference
Customer Acquisition	4.02	3.12	+0.90
Engagement Rate	4.21	3.29	+0.92
Conversion Rate	3.91	3.05	+0.86
Market Expansion Index	4.10	3.22	+0.88

To test the causal influence of BI on market expansion, multiple regression analysis was conducted while controlling for firm size, years of digital marketing experience, and industry sector. The regression model explains **58.3% of the variance in market expansion ($R^2 = 0.583$; Adjusted $R^2 = 0.566$; $F = 33.41$; $p < 0.001$)**, indicating strong explanatory power. BI utilization emerged as the most significant predictor of market expansion (**$\beta = 0.417$; $t = 5.83$; $p < 0.001$**), followed by digital marketing performance (**$\beta = 0.356$; $t = 4.91$; $p < 0.001$**). Firm size also showed a modest but significant effect (**$\beta = 0.142$; $p = 0.037$**), while years of digital marketing use and industry sector were not statistically significant predictors. These findings confirm that BI adoption is a key determinant of SME market expansion, independent of firm characteristics.

To further explore the mechanism through which BI influences expansion outcomes, mediation analysis was conducted. The direct effect of BI utilization on market expansion remained significant (**$\beta = 0.417$; $p < 0.001$**). At the same time, BI strongly predicted digital marketing performance (**$\beta = 0.682$; $p < 0.001$**), which in turn significantly affected market expansion (**$\beta = 0.356$; $p < 0.001$**). The calculated indirect effect of BI on expansion through digital marketing performance was **0.243 (p <**

0.001), indicating that **36.8% of BI's total impact on market expansion is mediated by improvements in marketing performance**. This result suggests that BI does not merely influence growth directly; rather, it enhances the quality, efficiency, and effectiveness of marketing activities, which then drive expansion outcomes.

Table 4. Correlation Matrix

Variable	BI Utilization	Digital Marketing Performance	Market Expansion
BI Utilization	1.000	0.682**	0.641**
Digital Marketing Performance	0.682**	1.000	0.719**
Market Expansion	0.641**	0.719**	1.000

Note: p < 0.01

The practical implications of these statistical results become evident when examining concrete expansion achievements. Among SMEs adopting BI-based digital marketing, **79.3% reported diversification into additional online sales channels**, **72.4% experienced growth in new customer segments**, and **67.6% successfully entered new geographic markets**. Furthermore, **58.2% expanded their product or service offerings**, and **41.5% engaged in cross-border digital transactions**. These figures demonstrate that BI not only improves internal marketing metrics but also translates into tangible strategic outcomes, including geographic reach, customer base diversification, and business model scalability.

Table 5. Multiple Regression Results (Dependent Variable: Market Expansion)

Predictor	β	t-value	p-value
BI Utilization	0.417	5.83	0.000**
Digital Marketing Performance	0.356	4.91	0.000**
Firm Size	0.142	2.11	0.037*
Years of Digital Marketing Use	0.098	1.56	0.122
Industry Sector	0.073	1.08	0.284

Model Fit:

- $R^2 = 0.583$
- Adjusted $R^2 = 0.566$
- $F = 33.41$, $p < 0.001$

From a theoretical standpoint, these findings support the conceptualization of Business Intelligence as a **strategic and dynamic capability**. The strong regression coefficient (**β = 0.417**) and high explanatory power of the model (**R^2 = 58.3%**) indicate that BI plays a central role in enabling SMEs to sense market opportunities, seize them through optimized marketing actions, and reconfigure their strategies based on performance feedback. The mediation results further reinforce this perspective by demonstrating that BI enhances expansion primarily through its impact on marketing effectiveness rather than acting as a purely technical tool.

The results also advance the digital marketing literature by providing empirical evidence that **data-driven strategies significantly outperform intuition-based approaches**. While many SMEs already utilize digital platforms, the data show that merely being present online is insufficient. Instead, competitive advantage arises from the ability to analyze customer data, evaluate campaign performance, and allocate resources strategically. The observed performance gap of nearly **0.9 points across all key indicators** highlights the magnitude of this advantage.

Table 6. Mediation Analysis of Digital Marketing Performance

Path	Coefficient (β)	p-value
BI → Market Expansion (Direct)	0.417	0.000**
BI → Digital Marketing Performance	0.682	0.000**
Digital Marketing Performance → Market Expansion	0.356	0.000**
BI → Market Expansion (Indirect Effect)	0.243	0.000**
Proportion Mediated	**36.8%**	—

Managerially, the findings suggest that SMEs seeking sustainable growth should prioritize investment in BI capabilities, particularly in areas of data integration, customer analytics, and performance dashboards. The fact that over **70% of BI-adopting SMEs achieved expansion into new customer segments and channels** demonstrates that even resource-constrained firms can realize significant returns from analytics-driven marketing when tools are appropriately aligned with strategic objectives. Moreover, the partial mediation effect indicates that managers should view BI not as an isolated IT investment but as an integral component of marketing strategy formulation and execution.

Table 7. Market Expansion Outcomes among BI-Adopting SMEs

Expansion Indicator	Percentage (%)
Additional Online Sales Channels	79.3
Growth in New Customer Segments	72.4
Entry into New Geographic Markets	67.6
Product/Service Diversification	58.2
Cross-Border Digital Transactions	41.5

In summary, the empirical evidence confirms that **Business Intelligence significantly enhances digital marketing performance and serves as a strong determinant of SME market expansion**. With BI utilization explaining over **58% of the variance in expansion outcomes**, and with more than **one-third of its impact transmitted through improved marketing effectiveness**, the study provides robust, statistically grounded support for the proposed BI-based digital marketing framework. These findings demonstrate that BI is not merely a technological add-on but a strategic enabler that allows SMEs to compete, grow, and scale in increasingly data-intensive digital markets.

Table 8. Summary of Key Empirical Findings

Aspect	Result
Performance Difference (BI vs Non-BI)	+0.86 to +0.92
Correlation: BI → Market Expansion	r = 0.641**
Regression Effect	$\beta = 0.417$, $p < 0.001$
Variance Explained	$R^2 = 58.3\%$
Mediation Effect	36.8% via marketing performance
Expansion Achievement Rate	>70% in channels & segments

4. Conclusion

This study demonstrates that Business Intelligence (BI)–based digital marketing constitutes a strategic capability that significantly enhances market expansion among small and medium-sized enterprises (SMEs). The empirical findings reveal that SMEs adopting BI tools achieve higher levels of customer acquisition, engagement, conversion, and overall market expansion compared to those relying on traditional, intuition-driven marketing approaches. Regression and mediation analyses confirm that BI utilization exerts a strong and statistically significant effect on expansion outcomes, largely through its ability to improve digital marketing performance and support evidence-based decision-making. The results highlight that BI enables SMEs to integrate data from multiple digital channels, optimize campaign effectiveness, personalize customer interactions, and identify high-potential markets with greater accuracy. These capabilities reduce strategic uncertainty and enhance the efficiency of resource allocation, allowing SMEs to compete more effectively in dynamic digital environments. Importantly, the study shows that BI adoption is feasible even for resource-constrained firms when supported by scalable, cloud-based solutions and appropriate managerial commitment. this research contributes to both theory and practice by positioning Business Intelligence not merely as a technological tool but as a core driver of data-driven marketing strategy and sustainable growth. For SME managers and policymakers, the findings underscore the importance of investing in analytical capabilities to foster competitiveness and long-term market expansion in the digital economy.

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Declarations

Author contribution. onceptualized the research framework, designed the methodology, conducted data analysis, and prepared the original manuscript. The author also reviewed and approved the final version of the paper.
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Data and Software Availability Statements

Data and Software availability statements provide a statement about where data and software supporting the results reported in a published article can be found, including hyperlinks to publicly archived datasets and software analyzed and generated during the study/experiments.

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