Sciforce

International Journal of Computer Science and Data Engineering

Journal homepage: www.sciforce.org
ISSN : 3066-6813

Open Access Review Article

Big Data and Marketing Strategies in Banking: An SPSS Statistical Examination of Customer Engagement and Satisfaction

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Abstract

Introduction: Big data and sophisticated marketing communication techniques, the banking sector has changed. Banks are now information aggregators that use big data to improve client interactions rather than merely offering financial services. Banks can develop enduring relationships with customers, enhance service quality, and obtain a competitive advantage by incorporating cutting-edge communication technologies. In an increasingly digitized and competitive environment, banks must comprehend consumer behavior and marketing communication tactics in order to increase client loyalty and boost profitability.

Research Significance: By examining how big data and relationship marketing might promote client loyalty, this study adds to the expanding corpus of knowledge on marketing communication in the banking industry. It draws attention to how client retention is affected by marketing communication tactics like direct marketing, public relations, and internet interaction. The results give bank managers important information for creating communication plans that will improve client happiness and long-term company success. This study also emphasizes how crucial technology developments are to updating banking channels of communication and enhancing service quality.

SPSS statistics: SPSS (Statistical Package for the Social Sciences) is a widely used statistical software for data analysis. It is designed for researchers, analysts, and businesses to analyze data, visualize results, and perform statistical tests efficiently.

Input Parameters: Bank Type (Public, Private, Cooperative), Marketing Channel (Social Media, TV, Newspaper, Email, SMS, Events), Customer Segment (Retail, Corporate, SME, Wealth Management), Campaign Type (Promotional Offer, Brand Awareness, Customer Education, CSR), Communication Style (Formal, Casual, Personalized, Informative), Preferred Language (English, Spanish, French, German, Hindi, Chinese).

Evaluation Parameters: Customer Engagement, Brand Awareness Impact, Conversion Rate Effectiveness, Customer Satisfaction, Message Clarity.

Key Words: Marketing Communication, Customer Loyalty, Big Data, Relationship Marketing, Integrated Marketing Communication (IMC).

Introduction

According to the study's operational hypothesis, processing publicly available online and offline information sources using big data technology greatly increases the quantity of data that can be analyzed. As banks become into comprehensive information aggregators to support long-term transactions with target consumers, this enhances the connection between banks and clients, elevating their relationship to a new level of collaboration. The development of the theoretical and methodological underpinnings of big data processing in bank marketing activities is what makes the study scientifically novel. This allows the use of methodological tools for marketing communications to create enduring relationships with target consumers at any time and place. [2] Instead of being replaced, banking communication channels are being modernized and modified to fit the modern environment. Technological developments have enhanced workplace dynamics and individual communication styles, enhancing the working environment as a whole.

Received date: August 03, 2024 **Accepted date:** August 18, 2024; **Published date:** August 25, 2024

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These developments have also changed financial service practices, allowing banks to provide high-quality services to both personal and business clients. Banks are enhancing customer retention, revenue, service quality, and cross-selling rates by putting successful marketing techniques into practice. In a similar vein, offering superior customer service fosters client loyalty. Consequently, banking communication has become one of the industry's primary competitive advantages. [3] As per their research, it is crucial to examine consumer behavior in order to comprehend their changing inclinations and assist companies in creating goods and services that suit them.

They came to the conclusion that all marketing initiatives are based on consumer behavior. They also underlined that marketing communication strategies are a crucial component of marketing and ought to be created with all pertinent facets of consumer behavior in mind. [4] All of the components of the marketing communication mix were kept in the factor analysis as important determinants of customer loyalty in Ghana's banking industry. This indicates that fostering client loyalty in the sector is largely dependent on public relations, direct marketing, event planning, online marketing, personal selling, sales promotion, and advertising. [5] A successful and results-driven firm must have effective marketing communication. A company's goods and services can be greatly impacted by the innovative and strategic integration of different communication platforms by marketing communication professionals, which eventually fosters brand loyalty. It is well known that losing clients may be quite expensive for companies who prioritize making money. On the other hand, devoted clients frequently act as brand ambassadors, recommending the business to other prospective buyers, make repeat purchases, and

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are prepared to pay more for its products. [6] Relationship marketing and customer relationship management (CRM) are now fundamental business strategies in the digital age due to a number of factors, including shifting economic conditions, broad technology advancements, the move to online platforms, and improved communication methods.

A strategic strategy is necessary for relationship marketing to be successful because it cannot be carried out in a vacuum. The essential components needed to design and execute a successful relationship marketing strategy are examined in this study report. [7] This study's cross-sectional research design, which reflects the viewpoint of the banking sector at one point in time, is one of its limitations. Future study should take into account longitudinal studies for quantitative validation in order to strengthen the validity of the findings. Additionally, more research might look at a number of antecedents, including organizational culture, business strategy, innovation, and market orientation that support the growth of marketing capabilities. Investigating the possible impacts of marketing capabilities may potentially add significantly to the body of knowledge in marketing. [8] Due to fierce competition from both domestic and Foreign Service providers offering value-added solutions, bank marketing particularly customer relationship management, or CRM is essential for Indian banks. Over time, marketing's function in the banking industry has changed. Public relations were the main focus at first, but advertising and sales promotion took its place.

The focus on creating a sales-oriented culture came next. All facets of the marketing concept customer happiness, profitability, integrated strategy framework, and social responsibility have taken on equal significance in the contemporary banking environment. [9] This study follows a descriptive research design and relies on a survey questionnaire for data collection. A structured questionnaire was designed to assess effective managerial communication in the banking sector. Prior to the main survey, a pre-test was conducted with 20 banking managerial staff, and their feedback was gathered. Based on the insights from the pre-test, the final questionnaire was refined and developed. The finalized version was then hosted on the KOBO Toolbox platform for data collection. [10] Organizations have realized how important their people are to creating a long-term competitive edge as a result of the banking and financial services sector's growing competitiveness.

In order to successfully convey customer wants, company values, and strategic goals at all organizational levels, internal communication has consequently grown in significance. Fostering a two-way conversation between executives and staff is also crucial. By enhancing cooperation between organizational units, effective information systems should aid in the growth of business divisions. Employees must actively participate in comprehending and accomplishing the organization's goals and strategies for internal communication to be effective. More customer loyalty as well as a stronger sense of identity and dedication to the company might result from treating employees with the same priority as external clients. [11] Since this study is the first to apply the notion of relationship quality to the banking sector in Malaysia, it significantly advances the literature on banking marketing.

It also highlights important management factors, which offers insightful information about banking processes. Management will have a better understanding of the elements that contribute to the development of mutually productive banking relationships according to the study's conclusions and suggestions. This knowledge will therefore facilitate better strategic planning and decision-making. [12] The variety of financial services contributes to their complexity. Convincing clients to use financial services is their primary function. In addition to their intangible nature, many banking services contain sophisticated features that make them both mentally and physically intangible. Furthermore, the value and advantages of these services are mostly determined by the consumers' level of participation, knowledge, and abilities in addition to their characteristics. This is due to the fact that production and consumption are inextricably linked in financial services.

Many academics contend that direct distribution is the only practical solution, because these features need direct, face-to-face interactions between banks and consumers. In keeping with previous procedures, branch offices so still rely on conventional means of providing services. [13] More research is required to fully understand the correlations examined in this study. Before generalizations about the entire service sector can be made, more research in other areas is required, as this study only looks at banking services in one nation. By employing these frameworks and conducting the study in several businesses, researchers can determine the characteristics that set loyal consumers apart from disloyal ones and produce conclusions that are applicable to all industries. Relationship marketing policies' effects on other factors, like market share, customer satisfaction, profitability, and overall company performance, can also be investigated. Replicating this study in other businesses might yield deeper insights, even though the characteristics found were validated within the banking industry. [14] Banks should take this into account when creating their communication strategies and choosing promotional materials because consumers frequently view the retail banking offerings of several private banks as being comparable. As the "voice" of the brand in this situation, integrated marketing communication, or IMC, is crucial. In the eyes of customers, it is a crucial tool for positioning and differentiation.

One of the most effective ways for banks to obtain and keep a competitive edge in the market is to build and develop relationships with their customers through marketing communications. Using retail banking products as an example, this study emphasizes the significance of personalized IMC in Egypt's private banking industry, particularly in influencing credit card purchase intentions. [15] Using information from previous research, this study first looks at the particulars of communication in the banking industry. It highlights important communication models that banks can use in accordance with their strategic goals and looks at the function of marketing communication and the communication process, especially as they relate to banking institutions. In addition, it examines the primary communication channels used in banking and their alignment with marketing objectives. Given the growing diversification of communication methods, the study emphasizes the importance of Integrated Marketing Communication (IMC), a concept that improves the effectiveness of communication across different target audiences. [16] The study's primary conclusion is that, in contrast to early assumptions, communication has a greater impact on customer loyalty in Pakistan's banking industry than trust. When it comes to fundamental banking services, communication becomes a crucial tool for banks to differentiate themselves. Personalized, accurate, and helpful information and advice greatly increases client loyalty, trust, and satisfaction. Customers of Pakistani banks anticipate that their banks are well-versed in their industries.

Effective communication is crucial for fostering loyalty, even while trust is necessary for preserving and enhancing current connections. [17] The Ghanaian banking sector has undergone significant changes in recent years. With developments in deregulation, service technology, and growth objectives, banks in Ghana have encountered a new level of competition. To remain competitive in the evolving market, many banks are reevaluating their marketing strategies, placing greater emphasis on retaining valuable customers. Bank managers are increasingly interested in identifying the key factors necessary for building strong, mutually beneficial relationships with their most important customers. [18] The case studies offered insightful information about successful bank social media engagement tactics. These tactics consist of: (1) producing

engaging and pertinent content; (2) motivating clients to interact with the bank via online social networks; (3) inviting clients to submit suggestions for enhancing bank services for mutual gain; and (4) working with online communities to spread the word about social media campaigns. Similar strategies have also been highlighted in the existing literature on social media in bank marketing.

SPSS Method

A SAS program may need adjustments to run on older versions of SAS. Both the SAS and SPSS syntax files share the same logic and structure. In both cases, the first step is to open the data set to be analyzed, and the second step is to perform the regression analysis. One key difference is that the SPSS program runs three separate regression analyses, each representing a different model and resulting in three sets of output data bundled together. Conversely, the SAS program specifies the three different models within the same procedure, running a single regression analysis. In both SPSS and SAS, the next step involves the Sobel test equation to calculate the corresponding p-value, the mediated percentage of the total effect, and the indirect and direct effect ratios. Finally, the results are presented in a table or report that can be saved or printed [19]. In addition to its basic software, SPSS Inc. offers various additional packages, including SPSS Complex Samples, SPSS Tests, and SPSS Advanced Models. In this review, we focus on the additional package called SPSS Missing Value Analysis (MVA). MVA has gained attention in reviews of missing-value packages, likely due to the increasing use of multiple imputations. However, MVA does not support some of the most popular techniques.

While MVA is widely used in many environments, it is often seen as a second-best solution. Unfortunately, the methods implemented in MVA are not optimal. In this review, we discuss the methods used in MVA, their potential biases, and their limitations [20]. Descriptive statistics provide essential information about variables, focusing on measures of central tendency like the mean, median, and mode, which indicate the central point of a dataset. Additionally, measures such as the standard deviation, range, and interquartile range (IQR) illustrate the variability and spread of the data. To visualize the distribution of a variable, researchers commonly use histograms, stem-and-leaf plots, or box plots. Statistical methods often rely on fundamental assumptions, one of which is the assumption that a variable follows a normal distribution. In many analyses, normality is presumed without empirical testing, which can be problematic.

The validity and reliability of statistical conclusions depend on this assumption; if it is violated, the results may be compromised [21]. The importance of studying social science cannot be overstated. While stakeholders may not yet fully recognize its value, a shift away from the current trend of focusing primarily on engineering education is essential. Social science offers crucial insights into social facts and the human application of knowledge, playing a vital role in catalyzing positive change. Unlike the certainty often associated with science and engineering, social sciences and humanities teach us to embrace uncertainty and develop the ability to question established facts. Experts agree that this critical thinking is invaluable. Courses in religion, art, and music, though sector-specific, contribute to a well-rounded general education. Particularly in fields like management, the role of social sciences is significant and undeniably relevant, fostering a more inclusive and comprehensive educational experience [22]. The methodology of RCA standard regression analysis avoids issues related to treating different observations as independent of each other. This assumption is often violated in within-subject's designs, but it does not apply to the coefficients extracted from this set of data. Instead, each individual predictor and criterion for participants in RCA assumes a linear, continuous, and bivariate relationship. RCA can also be used for forecasting. Furthermore, RCA offers a flexible alternative to common ANOVA approaches and is utilized across various subjects, including reading, emotion, cognitive control, and numeracy cognition [23]. Social science as a discipline encompasses fields such as Business and Management, Humanities, Arts, Political Science, and Education. It includes several sub-divisions and, much like the scientific field, relies on experimentation and scientific measurements for accurate and reliable data analysis.

The Department of Social Sciences employs both quantitative and qualitative measurement tools to generalize findings, particularly in educational contexts involving large populations. While scientific methods are prevalent in data analysis within social sciences, researchers often face dilemmas in selecting the appropriate tools. The accuracy of data analysis is crucial as it affects the overall research outcomes. Therefore, the objective of this thesis is twofold: to discuss common statistical analyses and software used in social science studies, and to recommend appropriate statistical analysis methods [24]. These notes are divided into sections, each dedicated to a specific SPSS procedure used for analysis. They outline the steps required and provide guidance on interpreting the results. We also discuss any "tricks" or tips to overcome common difficulties. These notes are based on our own experiences in social science research, aimed at the typical graduate student with a basic understanding of statistics. Each section assumes that readers have some familiarity with specific types of analysis. Our interpretations and explanations are thorough, ensuring that even someone unfamiliar with a procedure like logistic regression can understand its purpose, execute the basic steps, and interpret the results effectively [25]. SPSS for Windows is a versatile statistical software suite that offers a variety of procedures.

When using SPSS, you interact with different types of windows. The currently active window is where you perform your actions. SPSS for Windows operates through a menu-driven interface, where you select options from pull-down menus to execute various operations. These menus display a full range of choices when selected. Entering and selecting data files in SPSS for Windows are straightforward. This guide will demonstrate how to enter raw data from scratch and open existing data files [26]. It seems like you're discussing a technical topic related to linear algebra and possibly optimization algorithms. Here's a paraphrased version of your text:"When only one team employs unity, it resembles the Eigenvector in Linear Algebra or Singular Value Decomposition, which offers a precise solution space. However, using multiple metrics lacks a discrete solution and involves numerical complexity managed by an algorithm. This algorithm iteratively finds orthogonal vector dimensions to locate objects, minimizing pairwise differences and ensuring gradual spatial adjustments [27]. Statistical data processing involves multiple formulas and procedures, which can be challenging to remember. One effective tool for this is the SPSS application. By inputting data into SPSS, statistical calculations become straightforward as the application automates the processing. SPSS is particularly beneficial for students studying statistics at the college level, offering ease in data processing without the need to memorize complex formulas.

In educational studies, the effectiveness of learning outcomes using SPSS-assisted guided discovery methods has been investigated, aiming to make statistics more engaging and accessible to students [28]. SPSS, developed by IBM in the USA, is software renowned for its capabilities in basic and advanced statistics. It is widely utilized across various industries including banking, defense, insurance, manufacturing, commerce, market research, scientific research, and education. SPSS facilitates both general and specialized statistical analyses, such as factor analysis, which simplifies the structures of variables by studying their causes. This method, originating in educational psychology, is a multivariate statistical technique that has gained significant traction in fields like psychology,

medical science, meteorology, and economics over the years. Factor analysis allows for the reduction of variables and the identification of underlying factors that explain complex relationships among data [29]. The use of mediation analysis serves primarily as an example to illustrate relationships between variables and their functional implications. A fundamental aspect of mediation involves examining both the direct and indirect effects, which are crucial statistically and practically significant in psychological research. While hypotheses often address mediation, systematic tests for the significance of indirect effects are infrequently conducted. This brief on mediation emphasizes the importance of testing indirect effects, offering SPSS and SAS macros for estimating indirect effects using both normal theory and bootstrap methods to establish confidence intervals, following the approach advocated by Baron and Kenny (1986) [30].

The number of siblings, their ages, genders, and their relationships with each other and with parents, as well as birth order, play significant roles. Moving on to the impact of interfamilial conflicts on the education and psychological well-being of children, it affects their socialization, health, and overall development. Childhood experiences with siblings, gender, and individual identity, alongside intellectual and personality development, can shape educational and career outcomes. Moreover, conflicts stemming from age differences often lead to issues of power, control, rivalry, and jealousy among children, potentially disrupting their psychological growth. Resolving these conflicts peacefully is crucial for maintaining a nurturing home environment, which is vital for the psychological resilience and development of children, especially affecting the patience and endurance of women [31]. SPSS, known for statistical analysis in the social sciences, is widely utilized across various sectors including research, health inspection, governmental agencies, academic research, marketing firms, and data mining enterprises. The original SPSS Handbook is recognized as one of the most influential books in sociology. SPSS enables researchers to conduct native statistical analyses and manage data, including tasks like case selection, file reformatting, and creating derived data variables. It also facilitates data documentation through metadata dictionaries stored within data files. At universities, SPSS is commonly used in psychology departments to facilitate statistical analysis and to support students in learning and performing various statistical procedures easily [32]. The last two methods have been extensively used by experts. Despite being widely recommended; classical experiments continue to dominate the empirical literature. Item Response Theory remains a commonly employed approach. One significant barrier to the adoption of Theory and Generalizability Theory is their limited availability in popular statistical software packages, which lack the necessary tools for conducting these analyses. The current article focuses on describing G Theory analyses, outlining straightforward procedures for running these analyses using SPSS, SAS, and MATLAB [33].

Result and Discussion

Table 1: presents the reliability statistics for a scale consisting of five items.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.524	0.222	5

Table 1 presents the reliability statistics for a scale consisting of five items. The key measure, Cronbach's Alpha, is reported as 0.524, which indicates the internal consistency of the scale. Generally, a Cronbach's Alpha above 0.7 is considered acceptable for good reliability, while values between 0.5 and 0.7 suggest moderate reliability. Since the reported value is 0.524, it implies that the scale has a relatively low level of internal consistency, meaning that the items may not be highly correlated with each other. Additionally, the Cronbach's Alpha Based on Standardized Items is 0.222, which is notably lower than the original Alpha. This suggests that standardizing the items (adjusting for differences in scale units) results in an even weaker reliability score, further indicating potential inconsistencies among the items. With N = 5, meaning the scale comprises five items, the low reliability may be due to poor item correlation, insufficient item count, or a lack of conceptual coherence among the questions. To improve reliability, researchers may consider revising or removing poorly performing items, increasing the number of items, or refining the scale to ensure it measures a cohesive construct.

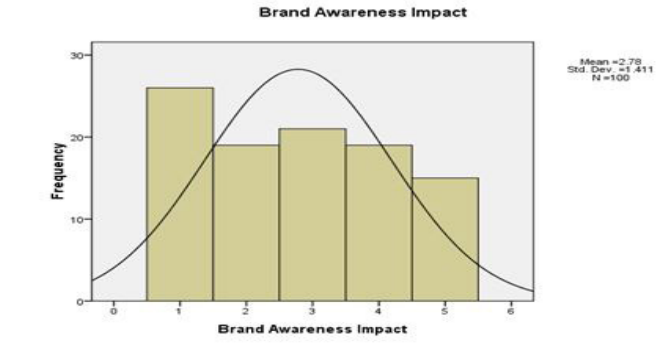

Figure 1: Customer Engagement

Figure 1 illustrates the distribution of Customer Engagement scores using a histogram with a superimposed normal curve. The x-axis represents the Customer Engagement ratings (1 to 5), while the y-axis denotes the frequency of responses. The histogram shows that responses are spread across all rating levels, with a notable peak at the lowest engagement level (1), indicating that a significant portion of respondents provided low engagement ratings. The distribution appears moderately skewed, with frequencies declining as scores increase. The mean Customer Engagement score is 2.94, with a standard deviation of 1.489, suggesting moderate variation in responses. The normal curve does not perfectly fit the histogram, indicating that the data might not be perfectly normally distributed. The presence of a higher frequency at low engagement levels suggests that many respondents experienced low to moderate engagement, with fewer individuals rating engagement at the highest level.

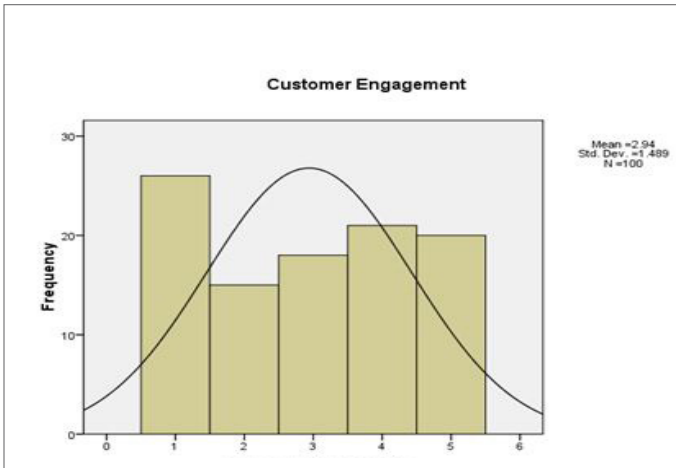

Figure 2: Brand awareness Impact

Figure 2 presents the distribution of Brand Awareness Impact scores through a histogram with a superimposed normal curve. The x-axis represents Brand Awareness Impact ratings (1 to 5), while the y-axis indicates the frequency of responses. The histogram reveals that responses are spread across all rating levels, with a notable peak at the lowest rating (1), indicating that many respondents perceived brand awareness impact as low. The distribution appears somewhat left-skewed, meaning a higher frequency of lower ratings compared to higher ones. The mean Brand Awareness Impact score is 2.78, with a standard deviation of 1.411, suggesting a moderate variation in responses. The normal curve does not perfectly align with the histogram, implying that the data may not follow a perfectly normal distribution. The pattern suggests that while some respondents perceived a positive brand awareness impact, a significant portion rated it low, highlighting potential concerns about brand visibility or recognition.

Table 2: Presents the descriptive statistics for five variables measured on a five-point scale (1–5) with a sample size of 100 respondents

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Customer Engagement	100	4	1	5	294	2.94	.149	1.489	2.219	-.008	.241	-1.421	.478
Brand Awareness Impact	100	4	1	5	278	2.78	.141	1.411	1.992	.158	.241	-1.268	.478
Conversion Rate Effectiveness	100	4	1	5	301	3.01	.149	1.487	2.212	-.074	.241	-1.427	.478
Customer Satisfaction	100	4	1	5	303	3.03	.150	1.501	2.252	-.052	.241	-1.400	.478
Message Clarity	100	4	1	5	320	3.20	.125	1.247	1.556	-.134	.241	-.977	.478
Valid N (listwise)	100												

Table 2 presents the descriptive statistics for five variables measured on a five-point scale (1–5) with a sample size of 100 respondents. The mean scores range from 2.78 (Brand Awareness Impact) to 3.20 (Message Clarity), indicating moderate ratings. The standard deviations vary between 1.247 and 1.501, suggesting moderate variability in responses. Skewness and kurtosis values show that all variables have negative kurtosis, indicating flatter distributions. Skewness values are close to zero, suggesting approximately symmetric distributions. The results indicate that Message Clarity received the highest mean rating, while Brand Awareness Impact was rated the lowest among respondents.

Table 3. Frequency Statistics

		Customer Engagement	Brand Awareness Impact	Conversion Rate Effectiveness	Customer Satisfaction	Message Clarity
N	Valid	100	100	100	100	100
	Missing	0	0	0	0	0
Median		3	3	3	3	3
Mode		1	1	1	1[a]	3
Percentiles	25	1	1	2	2	2
	50	3	3	3	3	3
	75	4	4	4	4	4

Table 3 presents the frequency statistics for five variables: Customer Engagement, Brand Awareness Impact, Conversion Rate Effectiveness, Customer Satisfaction, and Message Clarity. Each variable was measured on a five-point scale with 100 valid responses and no missing data. The median value for all variables is 3, indicating that the central tendency of responses is neutral or moderate. Similarly, the 50th percentile (median) is 3, meaning half of the respondents rated these factors at or below this value. The mode, or most frequently occurring response, is 1 for most variables, except for Message Clarity, which has a mode of 3. This suggests that while most participants rated Message Clarity neutrally, other variables had more frequent responses at the lower end of the scale, indicating possible dissatisfaction or weak engagement. Looking at the percentiles, the 25th percentile is mostly 1 or 2, showing that at least 25% of participants provided low ratings. Meanwhile, the 75th percentile is 4 across all variables, suggesting that the upper quartile of respondents had a more positive perception.

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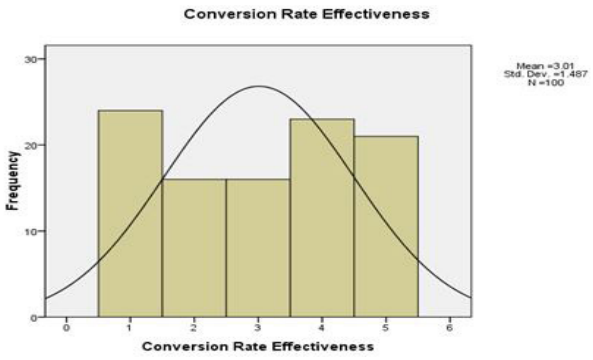

Figure 3: Conversion Rate Effectiveness

Figure 3 displays the distribution of Conversion Rate Effectiveness scores using a histogram with a superimposed normal curve. The x-axis represents Conversion Rate Effectiveness ratings (1 to 5), while the y-axis shows the frequency of responses. The histogram indicates that responses are distributed across all rating levels, with a noticeable peak at the lowest rating (1) and moderate frequencies across the other scores. The distribution appears somewhat symmetrical, though slightly skewed toward lower ratings, suggesting that a significant portion of respondents rated conversion rate effectiveness as low to moderate. The mean score is 3.01, with a standard deviation of 1.487, reflecting moderate variation in responses. The normal curve does not perfectly fit the histogram, suggesting some deviation from a normal distribution. The presence of a higher frequency at lower ratings (1 and 2) implies that many respondents were less satisfied with conversion rate effectiveness, while others had more positive experiences.

Figure 4: Customer Satisfaction

Figure 4 illustrates the distribution of Customer Satisfaction scores through a histogram with a superimposed normal curve. The x-axis represents Customer Satisfaction ratings (1 to 5), while the y-axis indicates the frequency of responses. The histogram shows that responses are evenly distributed across different rating levels, with a notable peak at the lowest rating (1) and the highest rating (5). This suggests that respondents had mixed opinions, with some being highly dissatisfied and others highly satisfied. The distribution appears somewhat symmetrical, though there is slight variability in frequency across the ratings. The mean Customer Satisfaction score is 3.03, with a standard deviation of 1.501, indicating moderate variability in responses. The normal curve does not perfectly align with the histogram, suggesting deviation from a normal distribution. The data implies that while some customers reported high satisfaction, a significant portion expressed low satisfaction, leading to a bipolar distribution of opinions.

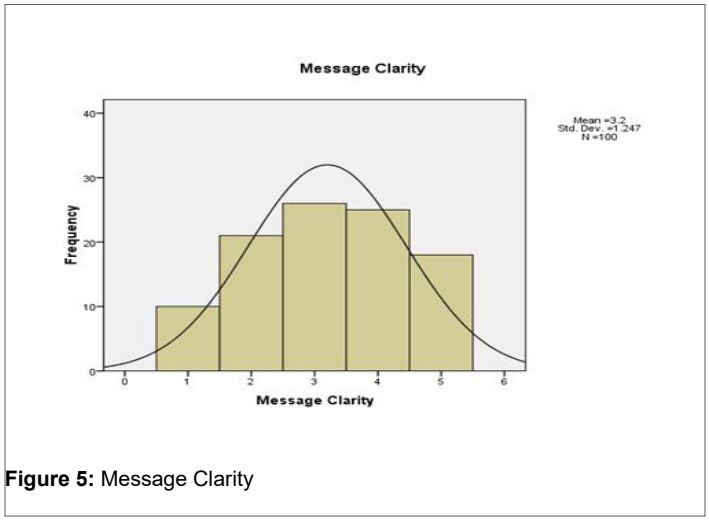

Figure 5: Message Clarity

Figure 5 illustrates the distribution of Message Clarity scores using a histogram with a superimposed normal curve. The x-axis represents Message Clarity ratings (1 to 5), while the y-axis indicates the frequency of responses. The histogram shows that responses are fairly distributed, with the highest frequency occurring around ratings 3 and 4. Unlike previous figures, this distribution appears more symmetrical and closer to a normal distribution. There are fewer low ratings (1 and 2), suggesting that most respondents found the message at least moderately clear. The mean Message Clarity score is 3.2, the highest among the variables analyzed, with a standard deviation of 1.247, indicating moderate variability in responses. The normal curve aligns more closely with the histogram, suggesting that the data follows a more normal distribution compared to other variables. Overall, the results indicate that Message Clarity received relatively positive feedback, with most respondents perceiving the messaging as clear and understandable

Table 4: Presents the scale statistics, summarizing the overall measurement properties of the scale used in the study.

Scale Statistics			
Mean	Variance	Std. Deviation	N of Items
14.96	12.463	3.530	5

Table 4 presents the scale statistics, summarizing the overall measurement properties of the scale used in the study. The mean score of 14.96 represents the average combined rating across all five items measured in the survey. This suggests that, on a scale where higher values indicate stronger agreement or positive responses, participants provided moderate ratings overall. The variance of 12.463 indicates the extent of variability in the total scores across respondents. A higher variance suggests a wider spread of responses, meaning participants had differing opinions on the measured factors. The standard deviation of 3.530 further supports this, showing that individual scores deviate moderately from the mean. With N = 5 items, the scale aggregates multiple aspects of customer engagement, brand awareness, conversion rate effectiveness, customer satisfaction, and message clarity. The moderate standard deviation and variance suggest that while responses vary, they do not exhibit extreme dispersion.

Table 5: Presents the Pearson correlation coefficients between five key variables

	Correlations				
	Customer Engagement	Brand Awareness Impact	Conversion Rate Effectiveness	Customer Satisfaction	Message Clarity
Customer Engagement	1	0.099	-0.041	0.1	-0.015
Brand Awareness Impact	0.099	1	-0.066	0.094	-0.021
Conversion Rate Effectiveness	-0.041	-0.066	1	0.154	.222*
Customer Satisfaction	0.1	0.094	0.154	1	0.013
Message Clarity	-0.015	-0.021	.222*	0.013	1

Table 5 presents the Pearson correlation coefficients between five key variables: Customer Engagement, Brand Awareness Impact, Conversion Rate Effectiveness, Customer Satisfaction, and Message Clarity. Pearson correlation values range from -1 to 1, where positive values indicate direct relationships and negative values indicate inverse relationships. The results show mostly weak correlations among the variables. Customer Engagement has a small positive correlation with Brand Awareness Impact (0.099) and Customer Satisfaction (0.1), but these relationships are weak. Similarly, Brand Awareness Impact has a small positive correlation with Customer Satisfaction (0.094) but does not show strong associations with other variables. The most notable relationship is between Conversion Rate Effectiveness and Message Clarity (0.222), which is statistically significant. This suggests that as Message Clarity improves, Conversion Rate Effectiveness tends to increase. Additionally, Conversion Rate Effectiveness has a weak positive correlation with Customer Satisfaction (0.154), indicating a slight tendency for better conversion rates to align with higher satisfaction.

Conclusion

According to the report, big data technology has a revolutionary effect on financial relationships because of its capacity to process vast volumes of publicly accessible data. Banks are becoming complete information aggregators and strengthening their consumer relationships by implementing sophisticated data-driven tactics. Banks can now provide individualized services, raise client satisfaction, and maintain their competitiveness in an increasingly digital market thanks to this paradigm change. The development of theoretical and methodological underpinnings for big data applications in banking marketing, as well as the facilitation of dynamic and efficient contact with target consumers at all times and locations, constitute the study's scientific uniqueness. Instead of being displaced, modern financial communication channels are being enhanced to satisfy modern needs. In the end, technological advancements have improved customer experience and service delivery by revolutionizing workplace dynamics and communication patterns. Customer retention, revenue growth, and service quality have all greatly increased as a result of the incorporation of successful marketing methods. When paired with improved customer service, these enhancements help increase brand support and consumer loyalty. As a result, marketing communication has strengthened its position as a primary competitive advantage and emerged as a crucial differentiator in the banking industry. Consumer behavior is the foundation of all marketing initiatives. Businesses may provide goods and services that are suited to the needs of their customers by having a thorough understanding of their changing preferences.

The study highlights that in order to guarantee their relevance and efficacy, marketing communication strategies should be created with a thorough understanding of customer behavior. Public relations, direct marketing, sales promotions, and online marketing are all important factors that determine client loyalty, according to factor analysis conducted in Ghana's banking industry. Therefore, in order to cultivate enduring client connections, banks must successfully blend these components. Additionally, in the digital age, relationship marketing and customer relationship management (CRM) have emerged as key tactics. Relationship marketing requires a strategic strategy due to the move to digital platforms and changing economic conditions. To improve marketing capabilities, future studies should examine other elements like market orientation, innovation, and corporate culture. Broader insights into customer loyalty and corporate performance will be obtained by expanding the study to industries other than banking. In order to stand out in a crowded market, banks must employ integrated marketing communications, or IMC. As seen in Egypt's private banking industry, tailoring IMC methods can increase client involvement and have an impact on purchase decisions. Beyond trust, effective communication has a greater influence on banking relationships and is a potent instrument for fostering customer loyalty. Banks must constantly improve their marketing tactics as competition heats up in order to hold onto market share and provide exceptional customer service.

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Citation: PK Kanumarlapudi. "Big Data and Marketing Strategies in Banking: An SPSS Statistical Examination of Customer Engagement and Satisfaction"International Journal of Computer Science and Data Engineering., 2024, vol. 1, no. 2, pp. 1–8. doi: https://doi.org/10.55124/csdb.v2i3.252

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Citation: PK Kanumarlapudi. "Big Data and Marketing Strategies in Banking: An SPSS Statistical Examination of Customer Engagement and Satisfaction"International Journal of Computer Science and Data Engineering., 2024, vol. 1, no. 2, pp. 1–8. doi: https://doi.org/10.55124/csdb.v2i3.252