

Contribution of Human Resource Analytics Utilization to Employee Engagement in the Kenyan Banking Industry

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Abstract: The Kenyan banking industry is currently undergoing a rapid technological transformation, with the integration of big data and analytics emerging as key drivers of innovation and efficiency. Despite widespread recognition of the importance of employee engagement, there is a notable gap in the application of HR analytics within the Kenyan banking sector. This gap limits the precision and depth that HR analytics can offer, which could provide continuous, data-driven insights into employee engagement. This study sought to investigate the contribution of human resource analytics to employee engagement within the banking sector in Kenya. The specific objective of the study was to determine the effect of data collection methods on employee engagement within the banking sector in Kenya. The study adopted a cross-sectional research design and was anchored on Social Exchange Theory. The study targeted 1,000 employees within the banking sector in Kenya. Fisher's two-stage formula was used to calculate a sample of 278 employees, who were then, sampled using proportionate stratified sampling. Primary data was collected using structured and semi-structured questionnaires. A pilot test was conducted with 10% of the sample, resulting in 28 employees. The study used content and construct validity, while reliability was tested using Cronbach's Alpha, which indicated a high questionnaire reliability score of 0.747. Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 23, and findings were presented in tables. The unstandardized coefficient for data collection methods ($\beta = 0.551$, $p = 0.001$) indicates that for each unit increase in data collection methods, employee engagement increases by approximately 0.551 units, assuming all other factors are held constant. The study recommends that banks focus on enhancing the current use of data collection methods as these have positive and significant effects on employee engagement.

Keywords: Human Resource Analytics Utilization, Data Collection Methods, Employee Engagement, Kenyan Banking Industry.

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I. INTRODUCTION

The global banking sector is undergoing significant changes due to technological advancements, new regulations, and evolving customer needs. Digital transformation was first identified as a strategic priority for banks worldwide, as they seek to leverage digital tools to optimize business processes, deliver superior customer experiences, and drive innovation within the financial services industry (Deloitte, 2021). Additionally, there is a growing appreciation for the role of data analysis in supporting decision-making and enhancing organizational performance. Employee engagement has become a key driver of performance, with engaged employees

delivering better customer satisfaction and overall organizational outcomes (Gallup, 2021).

Despite widespread recognition of the importance of digitalization and data analytics, a substantial gap remains in the effective use of these technologies to enhance employee engagement within the global banking sector. While many banks have invested in digital tools and data analytics, the specific integration of HR analytics to boost employee engagement is still in its early stages. First, there is a lack of comprehensive frameworks that banks can adopt to implement HR analytics for employee engagement effectively. Many institutions are still experimenting with

various approaches, leading to inconsistent practices and outcomes (Deloitte, 2021). This lack of standardization makes it difficult to compare results across organizations and to establish best practices. Second, there is limited literature on the impact of HR analytics on employee engagement. Although numerous studies have focused on the benefits of digitalization and data analytics for operational efficiency and customer satisfaction, fewer studies have examined how these technologies specifically influence employee engagement and retention (CIPD, 2021). This research gap leaves banks without a solid evidence base to justify investments in HR analytics aimed at improving engagement.

Moreover, the skill gap in data analytics within HR departments presents another significant challenge. HR professionals often lack the necessary skills to analyze and interpret complex data, which limits the effectiveness of HR analytics initiatives (Davenport, 2018). Addressing this skill gap requires additional training and investment, which not all banks are prepared to undertake. Furthermore, privacy and ethical concerns related to data analytics pose barriers to adoption. Employees may be wary of how their data is used and whether it could impact their job security or privacy (CIPD, 2021). This concern highlights the need for robust data governance frameworks that ensure transparency and ethical use of employee data. Additionally, cultural resistance to change within banking institutions can hinder the adoption of HR analytics. Traditional banking cultures may resist the data-driven approaches necessary for effective HR analytics, preferring to rely on intuition and experience (Gallup, 2021). Overcoming this cultural resistance is crucial for successfully implementing HR analytics.

Regionally, the banking sector plays a pivotal role in driving economic development, facilitating trade and investment, and promoting financial inclusion. Countries such as South Africa, Nigeria, and Egypt boast mature banking industries with well-established institutions and regulatory frameworks (World Bank, 2020). However, other countries, including Kenya, Ghana, and Tanzania, are experiencing rapid growth and expansion in their banking sectors, fueled by increasing access to financial services and a growing middle class (African Development Bank Group, 2019). Despite these positive trends, challenges such as regulatory compliance, technological integration, and talent management persist, requiring tailored strategies to address local market dynamics and enhance competitiveness. Regulatory compliance remains a critical issue, as banks must navigate complex and evolving regulatory environments. For example, in Nigeria, compliance with the Central Bank of Nigeria's regulations continues to be a significant operational burden for banks (PwC, 2021). Technological integration is another major challenge, as banks strive to adopt new technologies to promote efficiency and improve customer service. However, the high costs of technology adoption and the need for robust cybersecurity measures pose considerable barriers (KPMG, 2020).

Talent management is also a pressing concern across the continent. African banks often struggle to attract and retain skilled workers, particularly in specialized areas like risk

management, data analytics, and digital banking. According to a report by the African Development Bank, there is a significant shortage of skilled workers within the banking sector, which hampers the industry's growth and innovation (African Development Bank Group, 2021). In Kenya, for example, a survey found that 45% of banks identified talent management as one of their top three challenges (Deloitte, 2020). Furthermore, while the adoption of digital banking is on the rise, there is a gap in digital literacy among the workforce, which affects the effective implementation and use of digital banking platforms. A study by McKinsey & Company revealed that only 22% of banking employees in Africa possess the digital skills necessary to fully leverage new technologies (McKinsey & Company, 2019). These digital skills gap further underscores the need for comprehensive training and development programs within the banking sector. Additionally, financial inclusion remains a relevant issue. Although there have been improvements, a significant number of people in Africa remain unbanked. In sub-Saharan Africa, only 43% of adults have an account with a financial institution or mobile money service provider, compared to the global average of 69% (World Bank, 2021). This gap highlights the importance of developing new financial products and services tailored to meet the needs of underserved groups.

Employee engagement is a significant determinant of performance in banking organizations. Employees who are engaged in their roles and aligned with company expectations are more likely to deliver excellent customer service, generate new ideas, and enhance organizational performance (Gallup, 2021). However, research suggests that engagement levels among employees in the Kenyan banking industry may be low. A survey by Deloitte found that only 43% of employees in the Kenyan banking sector felt engaged at work, while 27% reported low levels of engagement (Deloitte, 2020). In recent years, Kenyan banks have increasingly focused on implementing HR analytics to support data-driven decision-making within human resource management (Davenport, 2018). HR analytics involves using performance data, workforce demographics, and employee feedback to identify patterns, trends, and potential predictors of engagement (CIPD, 2021). In the context of employee engagement, HR analytics may help Kenyan banks identify factors that affect engagement levels, forecast employee turnover, and develop targeted strategies to improve engagement (Odhiambo & Munene, 2019). This enables banks to create a comprehensive, data-driven approach to employee engagement.

Employee engagement is a core element that influences organizational performance and competitive advantage. In the banking sector, engaged and committed employees are likely to provide excellent customer service, foster innovation, and strengthen organizational culture (Hassan & Mwangi, 2019). Furthermore, high levels of engagement result in increased employee retention, which reduces turnover costs and preserves institutional knowledge (Munene et al., 2021). In recent years, the Kenyan government has placed a greater emphasis on employee well-being and engagement through various regulations and industry initiatives. For instance, the

Employment Act mandates employers to provide safe working conditions, fair compensation, and opportunities for employee development (Government of Kenya, 2007). Additionally, industry trends such as the adoption of Environmental, Social, and Governance (ESG) principles underscore the significance of employee engagement as a component of sustainable business practices (KPMG, 2020).

Despite the growing interest in human resource (HR) analytics and its potential to enhance employee engagement, significant knowledge gaps persist in understanding how specific components of HR analytics contribute to employee outcomes within the banking sector in Kenya. This study aims to address these gaps through a focused investigation into the effects of data collection and analysis methods on employee engagement and the broader relationship between HR analytics utilization and engagement.

While the importance of data collection methods in HR analytics is recognized, there is limited empirical evidence on how different data collection techniques impact employee engagement in the banking sector. Existing literature primarily focuses on the general effectiveness of data collection methods without differentiating their specific effects on employee engagement. For instance, prior studies have shown that employee surveys and feedback mechanisms are essential for understanding engagement but have not delved deeply into how variations in data collection methods influence engagement levels (Saks, 2020). This study will address this gap by evaluating various data collection methods, such as surveys and interviews, to determine their specific effects on employee engagement within Kenyan banks.

II. PROBLEM STATEMENT

The Kenyan banking industry is currently undergoing a rapid technological transformation, with the integration of big data and analytics emerging as key drivers of innovation and efficiency. However, the success of this transformation heavily relies on the ability of banks to attract, retain, and engage a highly skilled and motivated workforce. Employee engagement, characterized by an emotional commitment to the organization and its objectives, stands as a pillar for success in service-oriented industries like banking. Despite the widespread recognition of the importance of employee engagement, there is a notable gap in the application of HR analytics within the Kenyan banking sector. Current HR practices are often based on traditional methods such as annual surveys and performance reviews, which can be subjective and infrequent, failing to capture the real-time dynamics of employee sentiment and behavior.

This approach lacks the precision and depth offered by HR analytics, which can provide continuous, data-driven insights into employee engagement. Research from other industries and geographical areas also points to the possibility of using HR analytics to improve employee engagement. For example, research has indicated that companies that employ HR analytics can get engagement levels that are 30% higher. Further, organizations that leverage data in decision making

in human resource management are likely to perform better than their counterparts in terms of financial performance and employee productivity. These findings indicate that HR analytics can be a valuable tool in changing the approach to HR and making it more strategic and data-driven. In the Kenyan banking industry, there is limited research that has focused on the impact of human resource analytics utilization on employee engagement. While some banks have begun to explore the use of data analytics for operational improvements and customer insights, the application of these technologies to HR functions remains limited.

By focusing on the integration of HR analytics into employee engagement strategies, this study aims to fill this critical gap in the literature and practice. It will provide valuable insights into how Kenyan banks can utilize HR analytics to foster a more engaged, motivated, and productive workforce, thereby enhancing their overall competitiveness and sustainability in the rapidly evolving financial landscape.

A. Research Objective

- To determine the effect of data collection method on employee engagement in Kenya's banking industry.

B. Research Hypothesis

- H_{01} : Data collection methods do not affect employee engagement in Kenya's banking industry.

III. LITERATURE REVIEW

A. Social Exchange Theory

According to Social Exchange Theory (SET), organizational interactions are reciprocal, involving mutual exchange (Blau, 1964). Employees reciprocate positive organizational actions by performing their roles effectively and contributing to organizational goals (Rousseau, 1995). HR analytics, when perceived positively—such as improving efficiency or fostering fairness—can enhance this exchange relationship by signaling organizational care for employees. This can boost engagement, particularly in the banking sector, where human capital drives service delivery, compliance, and innovation (Cropanzano & Mitchell, 2005). However, negative perceptions of HR analytics, such as intrusiveness or lack of transparency, can harm engagement and diminish trust (Erdogan et al., 2012).

Key social exchange components within HR analytics include perceived organizational support (POS), trust and transparency, and fairness. Employees feel supported when analytics improve their work or ensure fair evaluations, fostering reciprocal engagement (Eisenberger et al., 1986). Trust is built through transparent and ethical data use, while fairness ensures HR analytics are unbiased, avoiding perceptions of injustice (Dirks & Ferrin, 2001; Cropanzano & Greenberg, 1997). Positive social exchanges enhance employee well-being and satisfaction, but negative exchanges can lead to disengagement and dissatisfaction (Rhoades & Eisenberger, 2002).

Factors such as organizational culture, leadership style, and demographics influence these dynamics. Supportive cultures amplify the positive impacts of HR analytics, while hierarchical cultures may suppress engagement. Future research should explore longitudinal and cross-cultural perspectives to understand evolving perceptions of HR analytics and their impact on turnover and performance. Applying SET to HR analytics offers valuable insights into optimizing employee engagement and organizational performance.

B. Data Collection Methods Concept

HR analytics employs diverse data collection methods to gain insights into employee behavior, performance, and organizational dynamics. Common methods include surveys, interviews, performance evaluations, and digital tracking systems, each offering unique advantages in generating actionable insights (Rasmussen et al., 2020).

Surveys, a widely used approach, provide both quantitative and qualitative data on employee attitudes, engagement, and satisfaction. For instance, 85% of organizations globally use engagement surveys to assess organizational culture and identify improvement areas (Deloitte, 2021). Interviews complement surveys by offering deeper qualitative insights into employee motivations and challenges, with 68% of HR leaders considering them effective for uncovering organizational issues (Bersin et al., 2018).

Performance evaluations offer critical insights into job performance, skills, and development needs, guiding employee growth. Globally, 82% of organizations conduct performance appraisals to assess employee achievements and provide constructive feedback (Gartner, 2021). Additionally, digital tracking systems, including monitoring software and productivity platforms, collect real-time data on employee activities. These systems help organizations identify inefficiencies and optimize processes, with 74% of companies leveraging such tools to enhance productivity (PwC, 2020).

Together, these methods enable HR analytics to transform human resource management, facilitating strategic decision-making in workforce planning, talent management, and organizational development.

C. Employee Engagement Concept

Employee engagement refers to employees' emotional and psychological connection to their work, colleagues, and organization. Engaged employees are proactive, motivated, and aligned with organizational goals, contributing to its success through enthusiasm and dedication (Kahn, 1990). High engagement is linked to increased productivity and profitability, with Gallup (2020) reporting a 22% rise in profits for highly engaged organizations. Similarly, Deloitte (2019) found that mature HR analytics capabilities enhance engagement, emphasizing the potential of data-driven strategies in fostering workforce commitment.

Job satisfaction, a multidimensional construct encompassing intrinsic and extrinsic factors, significantly influences engagement and organizational outcomes. Intrinsic factors, such as task variety and autonomy, and extrinsic factors like compensation and recognition, shape employees' attitudes and behaviors (Locke, 1976). Research by Judge et al. (2001) highlights a strong correlation between job satisfaction, performance, and reduced turnover, while Harter et al. (2002) link satisfaction to higher engagement and productivity.

Organizational commitment, encompassing affective, continuance, and normative dimensions, reflects employees' attachment to their organization. High commitment drives job performance, reduces turnover, and fosters organizational citizenship behaviors (Meyer & Allen, 1991). Positive leadership, supportive culture, and job satisfaction enhance commitment.

Work engagement, characterized by vigor, dedication, and absorption, predicts employee well-being and organizational success. Research shows engaged employees deliver better performance and customer service. In the banking sector, fostering engagement through leadership, recognition, and resources boosts efficiency and competitiveness (Salanova et al., 2011). By enhancing engagement, commitment, and satisfaction, organizations can achieve long-term success.

D. Effect of Data Collection Methods on Employee Engagement

Kaaria (2024) investigated the critical HR metrics and analytics required for establishing and preserving sustainable work environments in organizations through a thorough mapping of the literature and conceptual synthesis. In order to evaluate and improve sustainability factors including employee engagement, retention, productivity, well-being, diversity, equality, and inclusion (DEI), and environmental sustainability practices, a wide range of HR metrics and analytics were examined in this study. Through a methodical examination of existing literature and academic sources, this study identifies crucial HR metrics and analytics frameworks that facilitate sustainable work practices. It also clarifies the interactions and connections between these HR analytics and indicators. The findings from this research contribute to advancing the understanding of the strategic role of HR metrics and analytics in promoting sustainability within organizations. By adopting a data-driven approach and utilizing relevant metrics and analytics tools, HR professionals and organizational leaders made informed decisions, implement targeted interventions, and cultivate work environments that foster employee well-being, organizational resilience, and long-term sustainability. This research offers valuable guidance for HR practitioners, researchers, and policymakers seeking to enhance sustainability practices in the workplace. Whereas, the study pinpointed crucial HR metrics and analytic framework that facilitated sustainable work practices, the current study specifically investigated the effects of data methods, data analysis methods and human Resource analytics measurement on employee engagement.

Rigamonti, Colaiacovo, Gastaldi & Corso (2023) analyzed employees' perceptions of data collection processes for human resource analytics (HRA). More specifically, the study was on the effect of information sharing practices on employees' attributions (i.e. benevolent vs malevolent) through the perceived legitimacy of data collection and monitoring processes. Moreover, they investigated whether employees' emotional reaction (i.e. fear of ratification) depends on their perceived legitimacy and attributions. The research was based on a sample of 259 employees working for an Italian consulting firm that developed and implemented HR analytics processes over the past three years. The hypothesized model was tested using structural equation modeling (SEM) in Stata 14. The research found that employees perceive data collection processes for HR analytics as both coercive and caring organizational practices, depending on the information available to them and the perceived legitimacy of these processes. Furthermore, the legitimacy perceived by employees and their attributions determine their fear of being "datafied," treated as a number, and feeling threatened in terms of their human complexities. In contrast, the current study was conducted in Kenya and employed a cross-sectional research design to assess the contribution of human resource analytics to employee engagement in the Kenyan banking industry.

Ravesangar & Narayanan (2024) conducted research on the adoption of HR data analytics to enhance employee retention in the workplace. This study delves into the significance of HR data analytics in the realm of employee retention, aiming to assess the efficacy of data-driven decisions. The review sought to discover relevant articles published between 2010 and 2023, emphasizing indexed and non-indexed papers from credible electronic databases. Data sources included Science Direct, Emerald Insight, Scopus, EBSCOhost Databases, IEEE Xplore, and ProQuest. These databases were chosen since they provide a broad and thorough coverage of scholarly literature in human resource management. The initial search yielded 53 publications and articles. Following the screening procedure, 42 publications were identified as relevant to the study, with a primary focus on HR analytics and employee retention. The criteria for article selection included editorial, opinion, theoretical, qualitative, and quantitative studies that focused on the relationship between HR analytics and employee retention. A thorough examination of scholarly publications was undertaken, encompassing both indexed and non-indexed papers sourced from reputable electronic databases to gain insights into the present understanding of HR analytics and its influence on employee retention. The discussion uncovers that HR analytics has a noteworthy impact on improving employee retention in the workplace. The current study differs with Ravesangar & Narayanan (2024) in the sense that it was done in Malaysia and delved on the adoption of HR data analytics to enhance employee retention in the workplace while the current study was on the influence of HR analytics utilization on employee engagement.

Khan, Malik, and Khan (2024) conducted a study aimed at identifying the types of human resource decisions that can benefit from analytics and understanding the challenges and

opportunities associated with incorporating data into decision-making. Impact on Human Resource Functions: The study examined specific areas within human resource management where analytics can have a significant impact. This involved studying talent acquisition, employee engagement, performance management, training and development, and other HR functions to assess how data-driven approaches can enhance efficiency and effectiveness. The study was primarily based on primary data collected from the human resource management personnel of the top 10 private life insurance companies, which were selected for data collection. The data were gathered from 194 employees of the HR departments. A quantitative method was used to analyze the primary data. The data were collected through a questionnaire-based survey, which consisted of closed-ended questions. Multiple regression analysis and t-tests were applied to analyze the data. The Statistical Package for the Social Sciences (SPSS) software was used to process the data. The study found that the benefits of human resource analytics include quick and reliable information processing, helping managers draw meaningful patterns from the data, and providing deeper insights into employee data.

E. Conceptual Framework

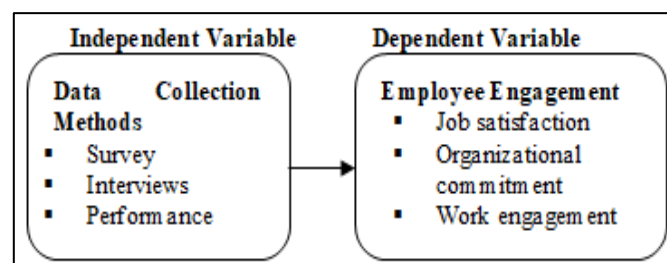


Fig 1: Conceptual Framework

IV. RESEARCH METHODOLOGY

A. Study Design

The study employed a cross-sectional research design to assess the contribution of human resource analytics to employee engagement in the Kenyan banking industry. This approach is effective for collecting data at a single point in time, allowing for an estimation of the variable's status. By gathering data from a large group of respondents, the design enables rapid data collection. However, it has limitations in establishing causality and tracking changes over time. This study provided valuable insights into the current status of HR analytics and employee engagement in the banking sector.

B. Study Area

The research took place in Kisumu County, targeting all commercial banks operating in the area. Kisumu has a diverse banking sector, including commercial banks, microfinance institutions (MFIs), investment banks, and other financial intermediaries. Major commercial banks such as Equity Bank, Kenya Commercial Bank (KCB), Cooperative Bank, and Standard Chartered Bank have branches throughout the county, offering a wide range of banking services to residents and businesses. Microfinance institutions like Faulu Kenya and Kenya Women Microfinance Bank provide microloans

and savings accounts to marginalized populations. The county boasts of a robust financial ecosystem with well-established banking infrastructure, including branches, ATMs, and digital banking channels accessible to both urban and rural residents. This study aimed to provide valuable insights into the utilization of HR analytics in Kisumu County and its contribution to employee engagement in the banking sector, benefiting both academia and industry stakeholders.

C. Target and Sample Population

The target population will comprise approximately 1,000 employees of all commercial banks operating in Kisumu County, covering various levels and roles, including branch managers and middle-level managers overseeing operations and customer satisfaction, tellers and customer service representatives who interact directly with clients, relationship managers providing tailored banking solutions, loan officers managing loans, and support staff (administrative and IT personnel). The total number of employees working in commercial banks in Kisumu County is estimated to be approximately 1,000 (Kenya Bankers Association, 2023).

A stratified random sampling technique was employed to select participants from different banks, ensuring the representativeness of the Kenyan banking industry (Sekaran & Bougie, 2016). Within each stratum, employees were randomly selected to participate in the study. The sample size was calculated using Fisher's two stage formula since the target population is finite and less than 10,000 to achieve a sample size of 278.

D. Data Collection

Structured questionnaires were used to collect data from eligible participants, facilitated by trained research assistants. Based on the construct, a self-administered questionnaire was developed, incorporating items related to the use of human resource (HR) analytics, employee engagement, demographic data, and other relevant variables. Standardized measures ensured that the data collection was comparable and reliable. The questionnaire included structured questions about HR analytics from the employees' perspectives within their organizations. The method used was quantitative approaches to capture a broad spectrum of data. Primary data was used for the study.

To obtain the required information from a cross-section of informants, the identification of the informants was done.

A pilot survey was done before the actual study in the organization. Questionnaires were administered to 28 (10% of the sample) selected employees who did not participate in the final study and who responded positively to determine the validity of the research tools. The pilot survey aimed to point out weaknesses in the questionnaire which were then reviewed and rectified. Cronbach's alpha coefficient was utilized to measure reliability, a statistical tool commonly used to assess the internal consistency of survey items (questionnaires). Frankfort Nachmias and Nachmias (2012) established the Alpha value threshold at 0.7 thus forming the study's benchmark. Data Collection Methods had an $\alpha=0.747$ and Employee Engagement had $\alpha=0.715$ all exceeded the prescribed threshold of 0.7. Feedback on the content and structure of the research instruments was incorporated into the final draft. This procedure helped to establish the content validity of the instruments, ensuring they would elicit the right information for the study. Construct and content validity were achieved through literature review, piloting, and consultation with experts in the specific area.

E. Data Analysis

The data collected was reviewed, organized, edited, and computer-coded, then analyzed using version 23 of SPSS. Both descriptive and inferential statistics were used to analyze the data. The analysis involved frequencies and percentages, means and standard deviations, and regression analysis. Before analyzing the data, a five-point Likert scale was factored in while coding the data collection tool. The data was presented using frequency distribution figures and tables. This facilitated the description and explanation of the study findings. A linear regression model was utilized to test the association between independent and dependent variables under study.

V. DATA ANALYSIS, FINDINGS AND INTERPRETATIONS

A. Descriptive Statistics

Participants were requested to express their level of agreement with the statements that comprised the data analysis method on the HR analytics subscale. Each statement was assigned a numerical range, with 1 representing "Strongly Disagree," 2 representing "Disagree," 3 representing "Neutral," 4 representing "Agree," and 5 representing "Strongly Agree." The results are displayed in Table 1 provided below.

Table 1: Data Analysis Method on the HR Analytics

Statements	SD		D		N		A		SA		Mean	Std.Dev
	F	%	F	%	F	%	F	%	F	%		
My bank uses descriptive methods as data analysis methods in HR analytics	5	2.3	15	7.4	24	12.3	92	46	64	32	3.88	1.012
My bank uses inferential methods as data analysis methods in HR analytics	6	3	16	7.8	11	5.4	134	67	33	16.8	3.63	0.884
My bank uses predictive modeling as a data analysis method in HR analytics	4	2	4	2.2	8	4	148	74	36	17.8	3.86	0.751
My bank uses a machine learning Algorithm system as a data analysis method in HR analytics.	5	2.4	0	0	6	3	136	68	53	26.6	3.75	0.753
My bank uses multiple analytical	4	2	4	2.2	8	4	148	74	36	17	3.85	0.751

approaches to gain a comprehensive understanding of engagement.										.8		
Overall											3.79	0.830

From the research findings in Table 1, the majority 92 (46%) of the respondents agreed and 64 (32%) strongly agreed with the statement that their banks use descriptive methods as data analysis methods in HR analytics as shown by (Mean= 3.88, Std.Dev =1.012). The majority 134(67%) of the respondents agreed and 33 (16.8%) strongly agreed with the statement that their banks use inferential methods as data analysis methods in HR analytics as depicted by Mean= 3.63, Std.Dev =0.884. Further findings showed that the majority 148 (74%) of respondents agreed and 36 (17.8%) strongly agreed with the statement that their banks use predictive modeling as a data analysis method in HR analytics as depicted by M= 3.86, Std.Dev =0.751. It was agreed by the majority 136 (68%) and 53 (26.6%) strongly agreed that their banks use a machine learning Algorithm system as a data analysis method in HR analytics as

depicted by (Mean= 3.75, Std.Dev =0.753). Finally, it was agreed by the majority 148(74%) and 36(17.8%) strongly agreed that their banks use multiple analytical approaches to gain a comprehensive understanding of engagement as shown by (Mean=3.85, Std.Dev =0.751).

The overall mean of 3.79 therefore indicated that most of the respondents agreed on the effect of data analysis methods on employee engagement among bank employees in Kenya.

B. Inferential Statistics

Further analysis was carried out to establish the individual influence of data measurement on employee engagement in the Kenyan banking industry. The findings are presented as shown in Table 2.

Table 2: Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.767	0.628		4.401	0.040
	Data Analysis methods	0.551	0.184	0.494	2.995	0.001

a. Dependent Variable: employee engagement

The results from the regression analysis reveal insights into the relationship between data analysis methods and employee engagement. The unstandardized coefficient for data analysis methods is 0.551, indicating that for each unit increase in data analysis methods, employee engagement increases by approximately 0.551 units, assuming all other factors are held constant. This suggests a positive correlation between the presence of data analysis methods and employee engagement. The significance value (p-value) for data measurement is 0.001, which is below the common alpha level of 0.05. This indicates that the relationship is statistically significant; suggesting that data analysis method have a measurable effect on employee engagement. The t-value of 2.995 further supports this finding, suggesting that the effect of data measurement on employee engagement is robust and unlikely to have occurred by chance.

Therefore, data analysis method improves employee engagement. This finding agrees with the findings of Schaufeli and Bakker (2004) who examined the effectiveness of different data analysis methods in assessing employee engagement across several European countries. These studies underscored the importance of employing a range of data analysis methods to derive meaningful insights into employee engagement. Utilizing both descriptive and inferential statistics, as well as advanced techniques like logistic regression and structural equation modeling, can enhance the understanding of engagement and inform effective HR strategies.

VI. CONCLUSIONS AND RECOMMENDATIONS

Data Collection Method is important to the performance of employees as it stands out to be one of the influencers of employee engagement. From the current findings, it can be concluded that the data Collection Method has a positive and significant effect on employee engagement. Data Collection Methods also account for a significant amount of variance in employee engagement. Therefore, the data Collection Method has a significant influence on employee engagement. The study thus concludes that data Collection Methods have a positive and significant influence on employee engagement in Kenya's banking industry.

The banks are recommended to focus on enhancing the current use of survey, interviews and performance evaluation methods of data collection since the methods lead to positive and significant effects on employee engagement. The study recommends that the employees need to be informed of the availability of these data collection methods that will enhance the effectiveness of human resource analytic utilization since a sizable number of the respondents seem to be non-committal on the use of either of the data collection methods, which can be due to lack of information.

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