E-SELF-SERVICE SYSTEMS AND EMPLOYEE ENGAGEMENT IN THE ENERGY SECTOR FIRMS IN KENYA

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ABSTRACT

Firms in the Energy sector in Kenya are often faced with high operational demands and a rapidly evolving technological landscape, which often affects employee engagement. This study determined the effect of employee e-self-service systems on employee engagement in Kenya Power and Lighting Company and Kenya Electricity Generating Company. The study was anchored on Technology Acceptance Model. This study adopted descriptive research design and targeted 351 officers at the Human Resource and Administration, Finance, ICT, Supply Chain and Network Management departments at the Kenya Power and Lighting Company headquarters and Kenya Electricity Generating Company in Nairobi. Sample size was 105 respondents. This study used questionnaires to collect data. Data analysis was done with the aid of Statistical Package for Social Sciences (SPSS) software version 25. Descriptive analysis inferential statistics were conducted. Descripives results showed that respondents agreed that employee e-self-service systems affected employee engagement in Kenya's energy sector since the overall mean score was 4.09 and a 0.97 standard deviation on a five-point Likert scale. Additionally, there was a positive and significant correlation between employee e-self-service systems and employee engagement (P = 0.790, Sig = 0.000). Further, employee e-self-service systems showed a positive and highly significant relationship with employee engagement (β = 0.461, p = 0.000). The study concluded that employee e-self-service systems play a significant role in enhancing employees' ability to manage their personal and professional information and recommended regular digital literacy training to employees to ensure they can navigate the systems with confidence.

Keywords: Employee E-Self-Service Systems, Employee Engagement, Innovation.

INTRODUCTION

Employee e-self-service systems are digital platforms that allow employees to independently manage various Human Resource (HR)-related tasks, such as updating personal information, requesting time off, accessing payslips, and enrolling in benefits programs (Smith & Brown, 2021). These systems are designed to reduce administrative workload and enhance efficiency by enabling employees to handle routine HR functions without needing to contact HR personnel (Jones et al., 2023). ESS systems also provide employees with greater autonomy, flexibility, and real-time access to their personal and work-related data, improving overall engagement and satisfaction (Martin, 2022). In recent years, the integration of artificial intelligence (AI) and machine learning into ESS systems has further enhanced personalization, predictive analytics, and streamlined workflows (Davis, 2024).

Employee engagement refers to the emotional commitment employees have toward their organization, where they go beyond the basic requirements of their roles, contributing to higher

productivity, innovation, and overall organizational success (Kahn, 2019). It involves employees feeling motivated, valued, and aligned with the company's goals, leading to a more efficient and positive work environment. In the energy sector, employee engagement is of particular importance due to its impact on safety, performance, and operational efficiency. Engaged employees are more likely to prioritize safety, innovate in energy solutions, and maintain a strong sense of responsibility (Harter et al., 2020). Given the technical and often hazardous nature of energy industries, fostering engagement can improve workforce morale and reduce turnover, leading to long-term sustainability and growth for energy companies (Lockwood, 2017).

Kenya's energy sector features a dynamic mix of public and private entities involved in electricity generation, transmission, distribution, and regulation. The Kenya Electricity Generating Company (KenGen), a state-owned enterprise, leads in power production, supplying about 62% of the national output through geothermal, hydro, and wind energy. The Kenya Power and Lighting Company (KPLC) handles nationwide electricity distribution, while the Geothermal Development Company (GDC) explores and develops geothermal resources (Muchibi et al., 2022). Regulatory oversight is provided by the Energy and Petroleum Regulatory Authority (EPRA), and transmission is managed by the Kenya Electricity Transmission Company (KETRACO) (Afrigen Energy). Independent Power Producers (IPPs), including IberAfrica, OrPower, Rabai, and Tsavo, contribute around 26% of the installed capacity. Additionally, CrossBoundary Energy and Serengeti Energy support renewable projects across Africa (Wafula, 2024).

This study will target two key firms in the Kenyan energy sector: Kenya Electricity Generating Company (KenGen) and Kenya Power and Lighting Company (KPLC). These two organizations play a central role in electricity generation and distribution in Kenya, respectively. KenGen is the largest power producer in the country, while KPLC is the primary distributor of electricity to end-users. Their strategic importance, market dominance, and government affiliation make them ideal representatives for analyzing the performance and challenges within the energy sector. Therefore, insights derived from these firms can be generalized to similar organizations (ERC, 2021; World Bank, 2022).

Statement of the Problem

Studies by Marler and Boudreau (2017) and Kumar and Goyal (2021) show that using digital platforms such as Employee Self-Service (ESS) systems enhances employee engagement by improving access to information, empowering employees to manage their own data, and promoting timely communication. In Kenya's energy sector, which is characterized by high operational demands and a rapidly evolving technological landscape, maintaining high levels of employee engagement is increasingly challenging (Mwangi & Otieno, 2022). Despite the growing recognition of the key role played by digital platforms in improving employee engagement, firms within the energy sector have not fully embraced this approach. Employees in these firms face challenges such as delayed access to HR services, limited autonomy in managing personal employment data, poor internal communication, and lack of real-time feedback mechanisms. Studies by Ahmed et al. (2020), Mugisha and Otieno (2021), Chen et

al. (2019), and Otoo and Mishra (2022) have shown that such challenges significantly contribute to low employee engagement, reduced job satisfaction, and increased turnover across different sectors. If these issues are not adequately addressed, the performance of these key firms in the energy sector may decline, resulting in poor service delivery and diminished operational efficiency. Despite growing evidence that Employee Self-Service (ESS) systems positively influence employee engagement—for example, a study by Kumar and Goyal (2021) found that ESS enhances employee satisfaction by streamlining HR processes, while Moyo and Chikombingo (2020) reported increased employee involvement and motivation due to ESS adoption—research exploring this relationship within the energy sector remains limited. This study attempts to address this contextual gap by investigating the effect of employee e-self-service systems on employee engagement in Kenya Power and Lighting Company and Kenya Electricity Generating Company.

Theoretical Review

The study was anchored on Kahn's Model of Engagement and Technology Acceptance Model. Kahn's Model focus on specific psychological conditions that are likely to affect employee engagement at the workplace and explores how they can be maximized for optimal performance. The Technology Acceptance Theory (TAM) suggests that individual behavior is driven by attitudes, which are influenced by beliefs which determines their engagement levels.

Kahn's Model of Engagement

Kahn's model of employee engagement, proposed by William Kahn in 1990, is one of the earliest and most foundational theories in understanding employee engagement. Kahn, a psychologist and researcher, introduced the concept in his seminal paper, "Psychological Conditions of Personal Engagement and Disengagement at Work," published in *The Academy of Management Journal*. His work was pioneering in exploring the psychological underpinnings of employee engagement, focusing on the emotional and cognitive states of employees in the workplace.

Kahn's model identifies three core psychological conditions that affect employee engagement: meaningfulness**,** safety**,** and availability**.** Workers have a high likelihood of engaging when they find their work meaningful, which refers to the emotional and cognitive connection they feel towards their tasks, team, and the organizational mission. When workers perceive their work as valuable and aligned with their values, they see it as contributing to a greater purpose (Kahn, 1990). Safety refers to the need for employees to feel psychologically safe in the workplace, where they can express themselves, take risks, and participate without fear of negative consequences. A sense of safety fosters openness, creativity, and engagement, emphasizing the importance of trust in the workplace. Availability indicates that employees need the necessary physical, emotional, and cognitive resources to perform their work effectively. Having sufficient time, energy, and mental capacity is crucial for engagement; if employees feel overwhelmed or distracted, their ability to engage in their work is diminished (Kahn, 1990; Saks, 2006).

Kahn's model highlights that engagement is not merely about the activities an employee participates in but also about their emotional and psychological states. Managers must ensure that employees feel that their work is meaningful, that they can express themselves without fear of retribution, and that they have the resources to succeed. Organizations that foster these conditions may experience increased employee satisfaction, creativity, commitment, and productivity. Workers who feel engaged have a high likelihood of staying with the company, reduce turnover, and positively impact organizational culture. The model has been widely used to assess the role of leadership in creating an engaging work environment and in designing HR policies that focus on personal development and recognition (Saks, 2006).

One of the major critiques of the Kahn's model is the lack of clarity in how engagement is measured and operationalized. The model is primarily theoretical and does not provide specific metrics for gauging engagement across different organizational contexts (Truss et al., 2014). Additionally, the model's focus on individual psychological conditions can overlook broader organizational or cultural factors that may influence engagement, such as organizational structure, rewards, and external market pressures (Macey & Schneider, 2008). Furthermore, Kahn's model does not sufficiently account for the dynamic nature of employee engagement. Engagement levels can fluctuate over time depending on various internal and external factors, such as changes in management, economic conditions, or personal life events. Thus, while Kahn's model provides a useful framework for understanding engagement, it may not fully capture the complexities of employee engagement in real-world settings.

In a study of HR technology innovations in Kenya's energy sector, Kahn's model could provide essential insights into how technological and HR technology innovations contribute to employee engagement by addressing these core psychological conditions. Kahn's model could guide the study in identifying specific interventions such as creating clear communication channels, offering development opportunities, or providing adequate technical support that enhance employee engagement through meaningful and safe work environments.

Technology Acceptance Model

The key proponent of Technology Acceptance Model (TAM) is Davis (1989), who developed the model in the context of user acceptance of information technology (IT). TAM builds on the Theory of Reasoned Action (TRA), which suggests that individual behavior is driven by attitudes, which are influenced by beliefs. TAM further refines this model by focusing specifically on technology use, hypothesizing that two central beliefs—Perceived Ease of Use (PEOU) and Perceived Usefulness (PU)—determine an individual's technology acceptance. (PEOU) refers to the degree to which a person believes that using technology will be free of effort, while (PU) refers to the degree to which a person believes that using technology will enhance their job performance (Davis, 1989). TAM has since been extended and modified to suit different contexts, resulting in versions such as TAM2 (Venkatesh & Bala, 2008) and Unified Theory of Acceptance and Use of Technology (UTAUT), which integrates various models to improve prediction accuracy.

TAM's applicability extends beyond consumer technology adoption to organizational settings, particularly in the context of HR technology innovations (King & He, 2022). The model implies that if employees perceive these innovations as easy to use and beneficial for their work, they have a high likelihood to adopt them, leading to higher engagement and improved job satisfaction. In Kenya's energy sector, where technology adoption is crucial for modernization and efficiency, TAM can help HR professionals understand how to introduce and integrate digital tools effectively. For instance, if an energy company adopts an employee self-service portal, TAM suggests that the ease of navigating the portal and the perceived value in streamlining HR tasks will affect how well employees embrace this innovation, thus influencing their engagement (Venkatesh & Bala, 2008).

One key critique is that the model oversimplifies the complex process of technology acceptance by focusing only on two factors, which may not capture the full range of psychological, social, and organizational factors affecting technology use (Venkatesh & Bala, 2008). For instance, external factors like organizational culture, peer influence, and managerial support also play crucial roles in technology adoption but are not sufficiently addressed by the original TAM. Another criticism is that TAM assumes a linear relationship between perceived ease of use, perceived usefulness, and technology acceptance, whereas the reality may involve more complex interactions among various factors (Sun & Zhang, 2006). In some cases, even if a technology is easy to use, it may not be perceived as useful in the specific organizational context, thus hindering its adoption.

The Technology Acceptance Model (TAM) focuses on understanding how users come to accept and use new technologies. According to TAM, perceived ease of use and perceived usefulness are the key factors that influence whether employees will adopt digital tools and systems. In the context of digital onboarding, TAM helps explain how employees' perceptions of the ease and utility of digital platforms influence their engagement with the onboarding process. For HR analytics, TAM can guide the adoption of analytics tools by demonstrating their perceived usefulness and ease of integration into existing HR practices, ensuring a higher rate of acceptance among HR professionals and employees.

Empirical Review

Nguti and Mose (2021) studied the role of e-self-service on organizational outcomes at Higher Education Loans Board, Kenya. Consequently, the study established the extent to which the e-self-service function affects the organizational outcomes at Higher Education Loans Board (HELB). A descriptive research design was adopted for this study, where questionnaires were used as the main instrument for data collection. The sample used in the study included 158 respondents comprising all the 13 departments based at HELB Headquarters and regional Huduma Centre offices. Data analysis was done using MS-Excel and the Statistical Package for Social Sciences (SPSS). Results indicated that e-self-service has a significant effect on organizational outcomes at HELB. The focus of the study was based on organizational outcomes, but the current research focused on employee engagement.

Matloobtalab and Iversen (2023) investigated user perspectives and usability insights about a self-service portal using a mixed-method approach. For qualitative data collection, the techniques included cognitive walkthroughs and semi-structured interviews, while quantitative data collection was done through a questionnaire on the System Usability Scale (SUS) and other measurements. The SUS revealed that the design was acceptable, though with small extents of satisfaction, factoring the number of clicks a respondent would have to go through and the time taken to conclude the exercise. Qualitative analysis showed the experience of the users; they viewed design and learnability regarding reaching and retrieving information on the integrated multiple systems of this web portal. While this study utilized semi-structured interviews for the collection of data, this current study made use of the survey in collecting data.

Almaaitah et al. (2024), researched on the influence of e-Human Resource Management on employee performance in relation to employee engagement. Target samples were employees of Jordanian Service and Public Administration Commission. It targeted 262 employees in total; data was collected using questionnaires. Data analysis was done using SEM. The findings have pointed out that e-HRM has a direct influence on employee performance and employee engagement. Even though the study has used SEM to analyze the data, the current research used linear regression to analyze its data.

In their research study, Rawat and Sudarshan (2024) analyzed e-HRM practices adopted by the banking industry of Kathmandu city, the capital of Nepal, and its impact on job satisfaction, focusing on commercial banks. The overall responses were from 401 respondents using structured questionnaires. For analyzing the data, SPSS version 25 was utilized, and multiple regression analyses were done to predict employee satisfaction. Employee satisfaction showed a positive relationship with the practice of e-HRM. The above-mentioned study was focused on the banking industry, whereas this current research focused on the energy sector.

RESEARCH METHODOLOGY

This study adopted descriptive research design which is used to describe characteristics of a population, without manipulating variables. This study targeted 351 officers at the Human Resource and Administration, Finance, ICT, Supply Chain and Network Management departments at the Kenya Power and Lighting Company headquarters in Nairobi. Sample size was 105 respondents obtained by taking 30% of the total population according to Mugenda and Mugenda (2003). This study used questionnaires to collect data. Data analysis was done with the aid of Statistical Package for Social Sciences (SPSS) software version 25. Data was cleaned first then coding was done and entered in the software ready for analysis. Both descriptive and inferential statistics were carried out. Descriptive analysis involved generation of summary statistics (frequencies and percentages, means and standard deviations) while inferential statistics involved correlation and regression analysis.

The regression model was as shown

$Y = \beta_o + \beta_1 X_1 + \varepsilon_o$

Where:

Y = Employee Engagement
β_0 = Constant
β_1 = Coefficients of Independent variable
X_1 = Employee e-self-service systems
ε_o = Error term

RESULTS AND DISCUSSION

Descriptive statistics

Employee E-Self Service Systems

The study determined the effect of employee e-self-service systems on employee engagement in Kenya's energy sector. The mean and standard deviation for the statements of employee e-self-service systems are as presented in Table 1. The results showed that the respondents agreed that employee e-self-service systems affected employee engagement in Kenya's energy sector since the overall mean score was 4.09 and a 0.97 standard deviation on a five-point Likert scale. The findings revealed that accessibility of employee data through e-self-service systems impact employee engagement and trust in the energy sector in Kenya (Mean=4.12, std. dev=0.96). Findings further showed that e-self-service systems enhance employees' ability to manage their personal and professional information (Mean=4.27, std. dev=0.95). Additionally, results revealed that the response time for employee requests via e-self-service systems affects employee engagement in Kenya's energy sector (Mean=3.88, std. dev=1.05). The descriptive results also showed that the efficiency of response times in e-self-service systems contributes to employees' perception of organizational support (Mean=4.10, std. dev=0.96). The results showed that performance management tools integrated into e-self-service systems influences employee engagement in the Kenyan energy sector (Mean=3.99, std. dev=1.02) and that e-self-service systems that incorporate performance feedback tools affect employees' sense of progress in Kenya's energy sector (Mean=4.06, std. dev=0.91).

Table 1: Employee E-Self Service Systems

Employee e-self-service systems statements	Frequency and Percentages					Mean	SD
	SD	D	N	A	SA		
Accessibility of employee data through e-self-service systems impact employee engagement and trust in the energy sector in Kenya	3 2.9%	2 1.9%	14 13.3%	34 32.4%	52 49.5%	4.24	0.96
E-self-service systems enhance employees' ability to manage their personal and professional information	2 1.9%	4 3.8%	13 12.4%	31 29.5%	55 52.4%	4.27	0.95
The response time for employee requests via e-self-service systems	4 3.8%	7 6.7%	20 19.0%	41 39.0%	33 31.4%	3.88	1.05

affects employee engagement in Kenya's energy sector							
The efficiency of response times in e-self-service systems contributes to employees' perception of organizational support	2 1.9%	7 6.7%	10 9.5%	46 43.8%	40 38.1%	4.10	0.96
Performance management tools integrated into e-self-service systems influences employee engagement in the Kenyan energy sector	3 2.9%	6 5.7%	19 18.1%	38 36.2%	39 37.1%	3.99	1.02
E-self-service systems that incorporate performance feedback tools affect employees' sense of progress in Kenya's energy sector	1 1.0%	5 4.8%	19 18.1%	42 40.0%	38 36.2%	4.06	0.91
Overall mean score						**4.09**	**0.97**

The results of this study are in support of Brown and Williams (2021) who connoted that E-self-service systems empower employees by giving them control over their personal and professional information. They indicated that the convenience of accessing payslips, leave balances, and personal benefits data in real-time increases employee satisfaction and reduces dependency on HR departments. The ability to self-manage and update information helps employees maintain better control over their work-life balance and fosters a sense of autonomy. This increased self-reliance in managing personal records can lead to higher productivity and stronger engagement, as employees no longer feel bottlenecked by administrative processes. Chung and Liu (2023), however, offer a contrasting viewpoint by arguing that while these systems increase accessibility, they may inadvertently create barriers for employees with limited technological skills. For instance, older employees or those less familiar with digital tools may find it difficult to use these platforms effectively, which could lead to frustration or disengagement. They suggest that while technological efficiency is important, the loss of human connection in the workplace could harm overall employee engagement for certain groups, particularly those who prefer personalized service and support.

Employee Engagement

The study sought to establish employee engagement in Kenya's energy sector. Table 2 shows the mean and standard deviation for the specific employee engagement statements. The findings showed that the emotional connection employees feel towards their work and the organization influence overall engagement levels (Mean=4.17, std. dev=1.01). Findings further showed that strategies to enhance employees' emotional well-being can impact their motivation and commitment to the company (Mean=4.30, std. dev=0.91). Additionally, results showed that employees' ability to mentally engage with their tasks and contribute innovative solutions affect their engagement (Mean=4.19, std. dev=0.91). The descriptive results also showed that

providing employees with opportunities for intellectual growth and skill development improve cognitive engagement and enhance their overall performance (Mean=4.37, std. dev=0.91). The results showed that the ability to adapt to changing technologies and market conditions influence employee engagement (Mean=4.08, std. dev=0.94) and that fostering a culture of adaptability within teams contribute to higher employee engagement during times of organizational change (Mean=4.30, std. dev=0.80).

Table 2: Employee Engagement

Employee engagement statements	Frequency and Percentages					Mean	SD
	SD	D	N	A	SA		
The emotional connection employees feel towards their work and the organization influence overall engagement levels	4 3.8%	2 1.9%	16 15.2%	33 31.4%	50 47.6%	4.17	1.01
Strategies to enhance employees' emotional well-being can impact their motivation and commitment to the company	2 1.9%	3 2.9%	11 10.5%	35 33.3%	54 51.4%	4.30	0.91
Employees' ability to mentally engage with their tasks and contribute innovative solutions affect their engagement	2 1.9%	4 3.8%	11 10.5%	43 41.0%	45 42.9%	4.19	0.91
Providing employees with opportunities for intellectual growth and skill development improve cognitive engagement and enhance their overall performance	2 1.9%	4 3.8%	7 6.7%	32 30.5%	60 57.1%	4.37	0.91
The ability to adapt to changing technologies and	2 1.9%	4 3.8%	18 17.1%	41 39.0%	40 38.1%	4.08	0.94

market conditions influence employee engagement							
Fostering a culture of adaptability within teams contribute to higher employee engagement during times of organizational change	1 1.0%	3 2.9%	7 6.7%	47 44.8%	47 44.8%	4.30	0.80
Overall mean score						**4.23**	**0.91**

The results of this study are in support of Harrison and Thompson (2022) who emphasize the significant role of intellectual growth and skill development in enhancing cognitive engagement and improving employee performance. Their study highlights that when organizations offer continuous learning opportunities such as workshops, online courses, and leadership training, employees become more intellectually engaged with their work. Bennett and Perez (2021) support this assertion by noting that providing employees with opportunities for skill development not only enhances their capabilities but also leads to greater cognitive engagement. They argue that employees who participate in ongoing professional development initiatives feel more invested in their work, leading to improved performance outcomes. This sense of personal and professional growth creates a mutually beneficial environment for both the employee and the organization. Smith and Johnson (2021) present a contrasting viewpoint, suggesting that intellectual growth and skill development programs may not always lead to improved cognitive engagement or performance if not properly tailored to employees' specific roles. They argue that generic training programs, although beneficial in some cases, can feel irrelevant to employees who do not see a clear link between the development initiatives and their job requirements.

Inferential Statistics

Correlation Analysis

The Pearson correlation was employed to find the relationship between the independent variables and employee engagement as shown in Table 3

Table 3: Correlation Results

			Employee engagement
Employee engagement		Pearson Correlation	1
		Sig. (2-tailed)	
		N	105
Employee systems	e-self-service	Pearson Correlation	.790**
		Sig. (2-tailed)	.000
		N	105

The results in Table 3 shows the calculated r coefficient which helps in determining if the relationship is positive or negative and the p value which establishes the level of significance. The Pearson correlation coefficient between employee e-self-service systems and employee engagement indicates a highly positive relationship (P - 0.790). These systems empower employees by allowing them to manage personal and professional data autonomously, enhancing their sense of control and satisfaction. The statistical significance, with a p-value of 0.000, further validates the importance of self-service systems in engaging employees (Wang & Lee, 2020).

Regression analysis

The regression analysis assisted in demonstrating the size of effect employee e-self-service systems have on employee engagement as shown in Table 4.

Table 4: Regression Coefficients

		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
(Constant)		.641	.250		2.561	.012
Employee systems	e-self-service	.451	.096	.461	4.679	.000

a. Dependent Variable: Employee engagement

Employee e-self-service systems showed a positive and highly significant relationship with employee engagement ($\beta = 0.461$, $p = 0.000$). This suggests that for every unit increase in the effectiveness or availability of e-self-service systems, employee engagement could increase by nearly half a unit. This aligns with findings by Wang and Lee (2020), who assert that self-service portals empower employees to manage their personal data, benefits, leave applications, and career development autonomously. This level of control fosters trust, reduces administrative burdens, and creates a culture of transparency and empowerment.

The following is the regression model that resulted:

$Y = \beta_o + 0.461X_1$

Where:

Y = Employee Engagement

X_1 = Employee e-self-service systems

Conclusion and Recomendations

Regression results revealed a significant positive relationship. The study concludes that employee e-self-service systems play a significant role in enhancing employees' ability to manage their personal and professional information. By offering autonomy, convenience, and accuracy in accessing and updating personal data, these systems contribute to employee satisfaction and engagement. Employees can easily track their work records, benefits, and career development activities, leading to a more efficient and empowered workforce. However, it is vital to acknowledge that employee e-self-service systems may not be universally accessible or suitable for all employees, especially those with limited technological skills or

access. Therefore, while these systems offer many benefits, they also present challenges that need to be addressed for their full effectiveness.

Employee e-self-service systems significantly empower employees by granting them autonomy and direct access to essential HR functions such as payroll, benefits, leave applications, and performance records. To maximize this effect, it is essential that these platforms are designed to be user-friendly and mobile-accessible, ensuring all employees can engage with them effectively. Regular digital literacy training should be provided to ensure all staff can navigate the systems with confidence. Additionally, incorporating features such as real-time feedback tools, automated reminders, and performance dashboards can enhance transparency, build accountability, and foster a culture of open communication.

Future Research

Future research should explore the long-term impact of e-self-service systems on employee performance and retention across various industries. Comparative analyses between organizations with differing levels of technological infrastructure would offer valuable insights. Additionally, research should investigate how customization and personalization of these systems affect employee engagement, especially among diverse workforce demographics and remote or hybrid work environments.

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