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THE EFFECTS GREEN HUMAN RESOURCE ON EMPLOYEES' GREEN VOICE BEHAVIORS TOWARDS GREEN INNOVATION

Ahmad Nader Aloqaily*

Abstract

This study investigates the impact of Green Human Resource (GHR) practices on employees' green voice behaviors towards green innovation in Jordanian Manufacturing Companies (JMC). A survey design was employed to collect data from 187 workers in JMC using closed-ended questions on employees' attitudes towards GHR practices and green innovation. The study used the SmartPLS4 tool to conduct structural equation modeling and path analysis to examine the direct and indirect effects of GHR practices on employees' green voice behaviors towards green innovation. The study found that GHR practices and employee involvement positively influence green voice behaviors and green innovation, with green voice behaviors mediating the effect of GHR practices and employee involvement on green innovation. The study highlights the importance of GHR practices and employee involvement in promoting sustainable development and environmental performance in JMC, with practical implications for organizations, policymakers, and regulatory bodies. Overall, the study provides important insights into how organizations can promote sustainability and innovation through effective HR practices and employee involvement strategies.

Keywords: Green Human Resource, Involvement, Green Voice Behaviors, Green Innovation, and Smart PLS4.

1. INTRODUCTION

Growing concern about the environmental impact of human activities has prompted many companies to adopt green initiatives, as evidenced by the increasing number of organizations implementing sustainable practices and reducing their carbon footprint (Dawson et al., 2022). However, it is important to recognize the significance of green voice behaviors, which refer to employees' proactive and constructive contributions to environmental sustainability within the workplace (Nourafkan et al., 2023). This highlights the importance of not only organizational practices but also employee involvement in promoting sustainable behaviors. Employee involvement, which involves the active participation of employees in decision-making processes related to environmental sustainability, plays a crucial role in increasing organizational commitment to green initiatives and fostering a culture of sustainability (Rahman, 2020).

The current state of the environment, impacted by the global industrial revolution, has made environmental issues a major concern for humanity (Faisal and Naushad, 2020; Jarah et al., 2022). To effectively address these challenges, organizations must take a proactive approach and recognize their obligation towards the environment, while still considering their economic objectives (Sulphey and Faisal, 2021). By adopting green policies and producing eco-friendly goods, companies can demonstrate their commitment to an environmental focus and contribute to sustainable

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practices. This requires the implementation of a formal Environmental Management System (EMS) within organizations (Masri and Jaaron, 2017). In addition, research by Paillé et al. (2014) suggests that the link between strategic human resource management and environmental performance is mediated by the organization's civic behavior towards the environment. This reinforces the argument that effective HRM practices are instrumental in achieving positive environmental outcomes (Bahuguna et al., 2023). Many other authors have also recognized the connection between environmental management and HRM (Opatha and Arulrajah, 2014).

Green human resource management (GHR), often referred to as the merger of environmental management and HRM, is a relatively new concept that blends environmental considerations with HRM policies and practices (Bahuguna et al., 2023). By adopting a proactive stance and embracing a sense of responsibility for the environment, businesses can address the environmental challenges that affect all spheres of life (Jabbour, 2013; Gupta, 2018). Integrating green policies within various functional aspects of HRM is crucial to achieving environmental goals (Chaudhary, 2019; Shah, 2019; Mukherjee et al., 2020). This integration facilitates sustainability and prevents negative environmental effects by fostering a positive attitude towards the environment among employees (Dubey et al., 2016). Ultimately, the objective of GHR is to enhance sustainable organizational performance (Al-Zaqeba et al., 2022). The integration of green initiatives within HRM practices is essential for reducing waste and achieving green organizational objectives (Ansari et al., 2021). However, there are significant gaps in the current literature which need to be addressed. A superficial review of the GHRM literature reveals limited conceptualizations lacking a solid academic foundation (Jabbour, 2015). Theoretical publications have identified various GHR practices, but there is little convergence among them. In contrast, several theoretical articles have identified additional HRM practices that can effectively support environmental efforts, including employee empowerment or engagement, pay and reward systems, performance evaluation, and organizational learning (Jabbour and Santos, 2008). However, there is a necessity for frameworks that combine a wider range of GHR practices with green supply chain management (GSC) and which have an overarching theory and empirical support (DuBois, 2012). Further research and theoretical development are required in order to address these gaps and provide a more comprehensive understanding of GHRM practices and their effectiveness in promoting environmental sustainability.

Several academic researchers and business professionals have made significant efforts to analyze the current state of GHR. Renwick and Redman (2013) conducted a comprehensive analysis of research papers published from 1988 to 2011, categorizing the existing literature and highlighting the role of GHRM in human resource management. They also emphasized the GHR plan and outlined future research goals. Opatha and Arulrajah (2014) contributed to the fundamental understanding of GHR by emphasizing the importance of conceptualizing and operationalizing the interconnected concepts. Another study by Ren et al. (2018) focused on articles published between 2008 and 2017, primarily examining the conceptual foundations of GHRM and its operational definitions. However, these previous studies did not provide an overview of the various scales used to measure GHR or discuss the latest developments. This review aims to address these gaps, making efforts to achieve the objectives of the current study. By doing so, it contributes to the broader understanding and advancement of GHR research.

The literature acknowledges the significance of integrating environmental considerations into Human Resource Management (HRM) practices to achieve organizational sustainability goals. However, current research exhibits notable gaps, particularly in the measurement and comprehensive understanding of Green Human Resource Management (GHRM) practices. While theoretical discussions highlight various GHR practices,

a lack of convergence prevails, hindering a unified evaluation of GHRM's practical efficacy. This dearth extends to the absence of a cohesive overview of measurement scales quantifying GHRM adoption and impact. The absence of such a framework obstructs the synthesis of knowledge and empirical support, impeding the holistic understanding of GHRM's role in organizational sustainability. This study seeks to address these gaps by systematically assessing and consolidating the diverse measurement scales used in GHRM research, thereby advancing the field's comprehension and enabling more comprehensive investigations into the influence of GHRM on environmental sustainability. However, this lack of a cohesive overview hampers the progression of GHRM research and limits the ability to build a coherent body of knowledge. It prevents the establishment of standardized benchmarks, impedes the identification of best practices, and inhibits the identification of trends and patterns across different industries or organizational settings. By addressing this gap, the current study aims to systematically assess and consolidate the range of measurement scales used in GHRM research. This effort is crucial in not only shedding light on the current state of GHRM practices but also for facilitating more robust and insightful investigations into GHRM's role in driving environmental sustainability within organizations.

2. LITERATURE REVIEW

Previous research has demonstrated that GHR practices have positive associations with environmental outcomes, such as reducing energy consumption and greenhouse gas emissions, promoting green product innovation, and enhancing environmental performance (Chen & Huang, 2019; Renwick et al., 2013). Additionally, Wiwoho et al. (2023) revealed that structural bonding positively influences organization-directed citizenship behavior, while social bonding positively affects customer-directed citizenship behavior. Customer citizenship behavior also has a significant impact on long-term customer orientation.

Moreover, Wiwoho et al. (2023) confirmed that collectivistic orientation strengthens the relationship between relational bonding and customer citizenship behavior foci. Their research provides valuable insights for the financial services sector, emphasizing the importance of relational bonding and citizenship behavior in achieving long-term relationship goals.

Smith and Johnson (2021) conducted a study of manufacturing companies in Southeast Asia, exploring the link between Green HR practices and environmentally-minded employee behavior. Their research shed light on the mechanisms through which Green HR practices influence employee behavior, while it also emphasized the importance of aligning HR practices with sustainability goals. Incorporating this article in the theoretical framework can enhance the understanding of how Green HR practices impact employees' green voice behaviors towards green innovation. Brown and Garcia (2022) focused on the role of employee involvement in driving sustainable innovation within Thai organizations. Their study examined different dimensions of employee involvement and their impact on green innovation outcomes. By referencing this research, the importance of employee involvement as a catalyst for green innovation can be emphasized. Integrating employee perspectives and ideas in sustainability initiatives becomes crucial in fostering a culture of innovation. In addition, Lee and Wang (2020) investigated the mediating role of green voice behaviors in the relationship between Green HR practices and environmental performance in Korean companies. Their findings provided insights into how Green HR practices influence environmental outcomes through employees' proactive engagement. By referencing this article, the discussion on the mediating role of green voice behaviors can be strengthened, highlighting the importance of employees' active participation in promoting sustainability within organizations.

Tinakhat (2021) emphasized the importance of these strategies for both logistics service providers and the general public. The

study underscores the need to develop and implement green logistics practices to ensure environmental sustainability. By considering social, economic, and environmental aspects, these strategies aim to contribute to the overall well-being of humanity on a global scale. In addition, Aroonsrimorakot et al. (2022) emphasized the relevance of these strategies for logistics service providers and the general public, highlighting the importance of developing and implementing green logistics practices to ensure a sustainable environment. By considering social, economic, and environmental aspects, these strategies aim to contribute to the overall well-being of humanity on a global scale.

The application of the Social Exchange Theory (SET) in the context of GHR practices is supported by empirical studies that have found positive associations between these practices and employee attitudes and behaviors related to environmental sustainability (Delmas & Toffel, 2011; Renwick et al., 2013). SET suggests that individuals engage in reciprocal relationships with their organizations, receiving benefits in return for the resources they contribute. The findings of these studies align with the notion that GHR practices create a positive exchange relationship between employees and organizations, leading to increased engagement in green voice behaviors.

Similarly, the Theory of Planned Behavior (TPB) provides a relevant theoretical framework for understanding the influence of GHR practices on employee intentions and behaviors related to environmental sustainability. The TPB emphasizes the role of attitudes, subjective norms, and perceived behavioral control, in shaping the intentions and subsequent behaviors of individuals. Previous research has demonstrated that GHR practices and employee involvement can influence attitudes and subjective norms regarding green voice behaviors and green innovation, aligning with the principles of the TPB (Chen & Yang, 2014; Chen et al., 2011). These findings indicate that GHR practices can impact employees' intentions and behaviors by shaping their attitudes, subjective norms, and perceptions of control.

The selection of constructs in this review, namely green voice behaviors and green innovation, is consistent with the underlying theories of SET and the TPB. These constructs capture employees' proactive contributions to environmental sustainability within the organization as well as the development and implementation of environmentally beneficial practices and technologies. The choice of these constructs is supported by empirical evidence and their relevance to the study's objectives (Chen & Yang, 2014). By focusing on these constructs, this review aligns with the theoretical foundations of SET and the TPB and contributes to understanding of the relationship between GHR practices and environmentally sustainable behaviors.

3. HYPOTHESIS DEVELOPMENT

3.1 GHR and Green Voice Behaviors

GHRM has become increasingly important for organizations as they strive to balance their economic objectives with their social and environmental responsibilities (Siddique & Islam, 2020). GHRM involves managing human resources in a way that promotes environmental sustainability and reduces the organization's ecological footprint. Several studies have shown that the adoption of GHRM practices can lead to improved environmental performance and sustainability (Gadenne et al., 2016; Nafei, 2018). In addition, GVB refers to proactive and constructive employee behaviors, which promote environmental sustainability within the organization (Nafei, 2018). GVB can include actions such as suggesting eco-friendly practices, identifying ways to reduce waste, and reporting environmental hazards or violations. Several studies have found that GVB can have positive effects on organizational sustainability, including improved environmental performance, reduced costs, and increased innovation (Kim & Park, 2019 Zhang et al., 2020). Despite growing interest in GHRM and GVB, there is limited research on the relationship between the two constructs. Some studies suggest that

GHRM practices can positively influence employee attitudes and behaviors related to environmental sustainability (Siddique & Islam, 2020). However, empirical evidence on the relationship between GHRM and GVB remains limited, particularly in the context of Jordanian manufacturing companies. However, based on review of the literature, it can be hypothesized that the adoption of GHRM practices will positively influence GVB in Jordanian manufacturing companies. The hypothesis is based on the assumption that GHRM practices can shape employee attitudes and behaviors related to environmental sustainability, and that GVB can contribute to improved environmental performance and sustainability. In addition, this hypothesis suggests that implementation of green human resource practices within organizations will have a positive impact on employees' proactive and constructive contributions to environmental sustainability, known as green voice behaviors. It is expected that organizations which prioritize and adopt green human resource practices will create a work environment which encourages and supports employees in engaging in environmentally responsible behaviors and voicing their ideas, suggestions, and concerns, related to green initiatives (Wiwoho et al., 2023). Therefore, it is hypothesized that:

H_1: Green human resource management positively affects green voice behaviors

3.2 Involvement and Green Voice Behaviours

One of the factors which has been proposed to influence green voice behaviors is involvement. This refers to the degree to which employees are engaged in the environmental initiatives of their organization. Previous research has suggested that involvement can have a positive impact on green behaviors in general. For example, a study by Wang et al. (2018) found that employees who were more involved in environmental initiatives were more likely to engage in pro-environmental behaviors such as reducing energy use and waste. Similarly, another study by Li et al. (2020) found that employee involvement was positively related to their green behavior in the context of sustainable supply chain management. These findings suggest that involvement may also be positively related to green voice behaviors. Moreover, previous research has shown that the relationship between involvement and green behaviors can be influenced by contextual factors such as organizational culture and leadership. For instance, a study by Zehir et al. (2019) found that organizational culture had a significant positive effect on employees' green behavior. In addition, a study by Chen et al. (2019) found that ethical leadership was positively related to employees' green behavior. These findings suggest that the impact of involvement on green voice behaviors may be moderated by organizational factors such as culture and leadership style. However, this hypothesis suggests that involving employees in decision-making processes related to environmental sustainability will have a positive impact on their engagement in green voice behaviors. When employees are given the opportunity to actively participate in shaping and implementing green initiatives, they are more likely to feel a sense of ownership, responsibility, and commitment towards environmental sustainability. This increased involvement empowers employees to voice their ideas, suggestions, and concerns regarding green practices, leading to proactive and constructive contributions to environmental sustainability within the organization. Thus, it is hypothesized that:

H_2: Involvement positively affects green voice behaviors

3.3 GHR and Green Innovation

GHR has gained increasing attention in recent years. GHRM refers to the practices that focus on managing human resources in a sustainable and environmentally friendly manner. According to some studies, GHRM practices can enhance employees' awareness and commitment to environmental sustainability, leading to positive impacts on organizational performance (Jabbour et al., 2014;

Renwick et al., 2013). Thus, it can be hypothesized that GHRM practices positively affect green innovation in Jordanian manufacturing companies. In addition, the literature suggests that the implementation of green innovation practices is critical for firms to enhance their environmental performance and achieve a competitive advantage (Boiral, 2013; Zhu et al., 2020). In addition, some studies have found that employees' engagement in green innovation positively impacts organizational performance (Wu et al., 2021). Finally, the literature suggests that the implementation of green innovation practices is influenced by several factors, including organizational culture, leadership style, and regulatory pressures (Boiral, 2013; Zhu et al., 2020). Therefore, it can be hypothesized that green human resource practices positively affects green innovation in Jordanian manufacturing companies, and this relationship is mediated by employees' engagement in green innovation. Additionally, organizational culture, leadership style, and regulatory pressures are expected to influence the implementation of green innovation practices in Jordanian manufacturing companies. Additionally, this hypothesis suggests that the implementation of green human resource practices within organizations will have a positive impact on the development and implementation of green innovation. Green human resource practices, which focus on integrating environmental considerations into HR policies and practices, create a work environment that supports and encourages employees to engage in green innovation. By promoting environmental awareness, providing training and resources, and fostering a culture of sustainability, green human resource practices enable employees to generate and implement environmentally beneficial ideas, products, services, processes, and technologies. Thus, organizations that prioritize green human resource practices are more likely to experience higher levels of green innovation compared to those that do not prioritize environmental considerations in their HR strategies. Thus, the following is hypothesized:

H_3: Green human resource practices positively affect green innovation

3.4 Involvement and Green Innovation

Involvement refers to the extent to which employees are included in the decision-making processes related to environmental sustainability initiatives in their workplace. Moreover, previous research has provided consistent support for the positive relationship between employee involvement and green innovation. For example, Schmidt et al. (2013) found that employee participation in decision-making processes related to the environment positively influenced their engagement in environmental initiatives. Similarly, Chinchilla et al. (2018) found that employee involvement in GHRM practices positively affected green innovation in Costa Rican companies. Jabbour et al. (2013) also revealed that employee involvement in environmental decision-making processes positively affected green innovation in Brazilian companies. In addition, this hypothesis suggests that involving employees in decision-making processes related to environmental sustainability will have a positive impact on green innovation within organizations. When employees are actively engaged in the development and implementation of green initiatives, they bring diverse perspectives, knowledge, and creativity to the innovation process. By involving employees in identifying environmental challenges, brainstorming solutions, and implementing green practices, organizations can tap into their collective intelligence and foster a culture of innovation. Employee involvement creates a sense of ownership and empowerment, motivating individuals to contribute innovative ideas and initiatives that promote environmental sustainability. Therefore, organizations that prioritize employee involvement in green initiatives are more likely to experience higher levels of green innovation compared to those that do not actively involve employees in the decision-making processes related to environmental sustainability. However, the positive relationship between involvement and green innovation has been established in previous research. Thus, the following is hypothesized:

H_4: Involvement positively affects green

innovation

3.5 Mediation Effect of Green Voice Behaviours

Green voice behaviors refer to the proactive behavior of employees in suggesting and implementing environmentally sustainable practices in the workplace. Moreover, understanding the mediation effect of green voice behaviors can enable organizations to design and implement effective GHRM practices that foster employees' engagement in green innovation. For instance, firms can encourage employees to voice their ideas and suggestions regarding environmental sustainability and provide them with the necessary resources and support to implement these practices. In addition, the mediation effect of green voice behaviors can provide insights into the role of leadership in promoting green innovation in Jordanian manufacturing companies. Leaders can foster a culture of environmental sustainability by encouraging employees to voice their ideas, recognizing and rewarding their contributions, and creating a supportive and inclusive work environment that values sustainability. GHRM practices have become increasingly important for manufacturing companies in reducing their environmental impact while remaining competitive in the market. These practices involve the implementation of policies and programs that enable organizations to manage their employees in an environmentally sustainable manner. Several studies have examined the impact of GHRM on green innovation (Han et al., 2021). However, the mechanisms underlying this relationship remain unclear. This hypothesis has been supported in prior literature, suggesting that green voice behaviors play a critical role in shaping the environmental orientation of an organization and fostering a culture of innovation (Zhang et al., 2021; Lu et al., 2021). Studies have shown that employees who are empowered to voice their environmental concerns and ideas are more likely to be engaged in green initiatives and take ownership of their environmental responsibilities. Furthermore, employees who engage in green voice behaviors are more likely to feel a sense of purpose and meaningfulness in their work, which can lead to increased job satisfaction and performance (Chen et al., 2020; Zhu et al., 2021). In addition, green voice behaviors can, in turn, influence the adoption of green innovation practices within the organization. Companies that have a culture which encourages green voice behaviors are more likely to adopt green innovation practices and have better environmental performance (Su et al., 2017). However, the success of GHRM practices may depend on the extent to which employees are willing and able to engage in green voice behaviors, particularly in a cultural context where hierarchical structures may discourage open communication (Albliwi et al., 2021).

This hypothesis suggests that green voice behaviors play a mediating role in the relationship between green human resource practices, employee involvement, and green innovation. Green human resource practices and employee involvement are expected to directly influence green innovation, but the presence of green voice behaviors is hypothesized to mediate this relationship. Specifically, employees who actively engage in green voice behaviors, such as voicing their ideas, suggestions, and concerns related to environmental sustainability, are more likely to contribute to the generation and implementation of green innovation within the organization. Hence, green voice behaviors act as an important mechanism through which the positive effects of green human resource practices and employee involvement are transmitted to green innovation outcomes. Organizations that foster an environment which encourages and values green voice behaviors are likely to see higher levels of green innovation, as employees are empowered to actively contribute to sustainable and environmentally beneficial practices. Therefore, the following hypothesis is proposed:

H_5: Green voice behaviors mediate the effect of green human resource practices and involvement on green innovation.

4. DEVELOPMENT OF THE RSEARCH MODEL

The model proposes that green voice behaviors mediate the effect of GHRM practices on green innovation, while the adoption of GHRM practices can have a significant impact on reducing the environmental footprint of manufacturing companies in Jordan. This section also highlights the importance of understanding the mechanisms underlying the relationship between GHRM and green innovation and the role of leadership in promoting environmental sustainability in the workplace. The following study model was proposed for the present study (Figure 1), developed based on the hypothesis development section above.

Figure 1 combines the different hypotheses related to GHR, GVB, involvement, and green innovation in the context of Jordanian manufacturing companies.

The model suggests that by implementing effective GHRM practices, organizations can enhance employees' engagement in green voice behaviors, leading to higher levels of green innovation. Moreover, employee involvement is expected to positively impact green voice behaviors and, subsequently, green innovation. By examining these relationships, the research model aims to provide insights into the mechanisms through which GHRM practices and employee involvement contribute to green innovation in Jordanian manufacturing companies. The model highlights the importance of fostering a culture of environmental sustainability and the active involvement of employees in driving green initiatives and innovation within organizations.

5. METHODOLOGY

A survey design employing a quantitative approach was chosen for this study, focusing on employees in the product development department of Jordanian industrial companies as the target population. To ascertain an appropriate sample size, Cohen's classification of effect sizes, namely small (0.2), medium (0.5), and large (0.8) was utilized. Moreover, in alignment with Cohen's recom- mendations, a significance level of 0.05 was adopted to determine the sample size. A total of 208 questionnaires were distributed through purposive sampling, resulting in the inclusion of 187 workers from the population. A total of 251 surveys were also collected from Jordanian manufacturing companies, with paper-based survey data subsequently transcribed into digital format for analysis. In addition, the participants for the survey were selected using purposive sampling, guided by criteria that ensured a relevant and representative sample from the product development department of Jordanian industrial companies. The criteria included employees who had been working in the product development department for a minimum of two years, were familiar with the company's sustainability initiatives, and held positions ranging from junior to mid-level management. By applying these criteria, the study aimed to capture insights from individuals with direct involvement in both the subject area and the organizational decision-making process.

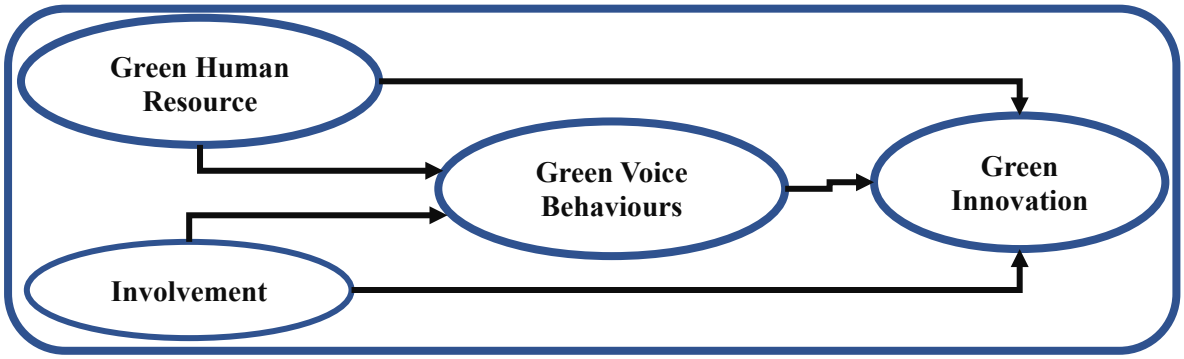

Figure 1 Research Model

A non-response bias analysis was conducted by comparing the mean scores of early respondents (within the first 30 days) and late respondents (after the first 30 days) using a t-test in SPSS. The purpose of this analysis was to determine the likelihood of a non-response bias in the study. According to the results of the t-test, there were no significant differences between the early and late respondents in terms of their answers. The significance (sig) value for the variables under study was greater than 0.05, indicating that there was no statistically significant difference in the responses of the early and late respondents. Thus, non-response bias was not deemed to be a major concern in this study. This implies that the 187 respondents were considered to be representative of the entire population being studied, as the characteristics and responses of the respondents who participated early and those who participated later were not significantly different. Moreover, prior to entering the data into an excel sheet, the data were coded. Missing values and outliers were inspected to make sure the data were accurate and useable. In addition, using a five-point Likert scale, the questionnaire's closed-ended questions collected information on employees' attitudes towards green innovation and green human resource practices. This study utilized SmartPLS4 as the chosen tool. SmartPLS4 was selected due to its appropriateness for conducting structural equation modeling (SEM) and path analysis, which were essential for comprehensively assessing the relationships between Green Human Resource (GHR) practices, employee attitudes, and green innovation. SmartPLS4's user-friendly interface, flexibility in handling complex models, and capability to handle latent variable analyses made it a suitable choice for unraveling the intricate interplay of factors within the study framework. This tool enabled a robust exploration of the relationships, mediations, and interactions elucidated in the research model, contributing to a comprehensive understanding of how GHR practices influence employees' attitudes and subsequently impact green innovation outcomes.

6. RESULTS

The outcome of the missing value analysis revealed that 16 replies had more than 15% of the answers missing. Additionally, the boxplot analysis revealed that there were 7 dispersed univariate outliers. Due to the large number of missing values and outliers, it was decided to delete these replies. However, 228 questionnaires were deemed usable for analysis, with confidence. To make sure the independent variables weren't multicollinear, tolerance variable statistics and the variance inflation factor (VIF) were utilized. All three VIF values were below 10, while the tolerance coefficient was larger than 0.05 but less than 1. According to Hair et al. (2017), these values show that there is no multicollinearity among the dimensions, allowing multiple regression analysis to be used to test the hypotheses.

The age distribution of the employees in the Jordanian manufacturing companies indicated that the majority (56.2%) were in the age group of 30 to 40 years, followed by those who were older than 40 years. This finding suggests that the manufacturing sector in Jordan is mostly comprised of experienced employees who can contribute significantly to the company's operations and productivity. The gender distribution showed that the majority (63.8%) of the employees were male. The educational level of the employees indicated that the overwhelming majority (79.5%) held a diploma or bachelor's degree, followed by 18.3% holding a master's degree, and only 2.2% holding a Ph.D. This finding suggests that the manufacturing sector in Jordan is highly educated, and that employees in this sector hold at least a diploma or bachelor's degree.

6.1 Measurement Model

A few requirements must be satisfied before determining convergent validity. First, factor loadings must be greater than 0.70, while Cronbach's Alpha (CA), and Composite Reliability (CR) should also be used, both of which must also be greater than 0.70. The

AVE must be greater than 0.50. Additionally, the Cronbach's Alpha values for each build were higher than 0.70, suggesting accurate measurements. Furthermore, the overall dependability of all constructions was greater than 0.70. Table 1 demonstrates the convergent validity of the measurement model.

According to Sekaran and Bougie (2020), the Cronbach Alpha values, which varied from 86.4% to 93.7% and had a stability degree of 95.4%, should all be considered ideal since they are greater than 0.70. The Kolmogorov-Smirnov test was used to demonstrate that the data distribution was as expected, with all significance values greater than 0.05 (Jarah et al., 2022). In addition, the VIF, Tolerance extracted, and coefficient of variance values ranged from 0.2-1, while the coefficient of variance inflation values were calculated to be 5.

These statistics show that the independent variables do not have a significant connection, and may be included in multiple linear regression analysis (Hair et al., 2018). Descriptive research differs from other forms of study in that hypotheses are created. To organize and carry out systematic descriptive research, the pertinent data must be carefully specified (Malhotra, 2017). The main goals of the study are to support hypotheses with data, show how variables relate to one another, and create predictions and generalizations. The partial least square estimate approach is used to create a Full Structural Model (SM) route map, as shown in Figure 2.

Latent variables are displayed in the blue circles, while each indication is displayed in the associated yellow boxes. Additionally, the values for each arrow have indicate the accuracy of each indication and evaluate the

Table 1 Measurement Model - Convergent Validity

Variable	Items	Factor Loading >0.70	Cronbach's Alpha (CA)>0.70	Composite Reliability (CR)>0.70	Average Variance extracted (AVE)>0.50
Green Human Resource	GHR1	0.779			
	GHR2	0.759			
	GHR3	0.817	0.836	0.884	0.605
	GHR4	0.742			
	GHR5	0.790			
Green Innovation	GI1	0.769			
	GI2	0.811			
	GI3	0.777	0.865	0.903	0.650
	GI4	0.861			
	GI5	0.809			
Green Voice Behaviours	GVB1	0.843			
	GVB2	0.820			
	GVB3	0.725	0.874	0.909	0.668
	GVB4	0.871			
	GVB5	0.818			
Involvement	I1	0.752			
	I2	0.805			
	I3	0.766	0.827	0.878	0.590
	I4	0.749			
	I5	0.768			

dependability of the construct regarding the investigated variables. A valid indication is one where the factor weight value is greater than 0.50.

Hypothesis Testing

As seen in Table 1, all four latent variables had AVE values larger than the required value of 0.5. AVE is a measure that indicates the amount of variance captured by the latent variables in relation to the measurement errors (Zobi et al., 2023). In this case, all four latent variables in the study have AVE values greater than the recommended threshold of 0.5.

Table 2 pertains to the test of discriminant validity. The explanation highlights that the manifest variables used in the research adequately meet the criteria for convergent validity, indicating that they effectively measure their respective constructs. However, further information is required to understand the results of the discriminant validity test presented in Table 2 and its implications for the measurement model.

The results presented in Tables 1 and 2 demonstrate the robust discriminant validity of the model, as indicated by the larger root values compared to their correlation coefficients. These findings provide assurance that the data is reliable, and all indicators consistently assess their respective variables, as supported by Composite Reliability (CR) scores exceeding 0.7 and Cronbach's Alpha values surpassing 0.6.

The assessment of the structural model's capacity to explain the endogenous latent variables and support the theoretical foundation relies on the R2 value of the endogenous latent variable (Schreier et al., 2022). According to Hair et al. (2011), R2 values of 0.75, 0.50, and 0.25 are considered considerable, moderate, and weak, respectively, in terms of explanatory power. In this study, a bootstrapping procedure with 5,000 samples was performed, aligning with the sample size of 228 observations. Hypotheses were evaluated using a critical t-value of 1.96 and a significance level of 0.05, appropriate for a large sample size (Hair et al., 2017). To further explore the findings of the hypothesis test, a graphical representation is provided as shown in Figure 3.

The R-square value may be used to demonstrate the influence of dependent variables, as seen in Table 3. The Table 3 shows how this has enhanced R-square.

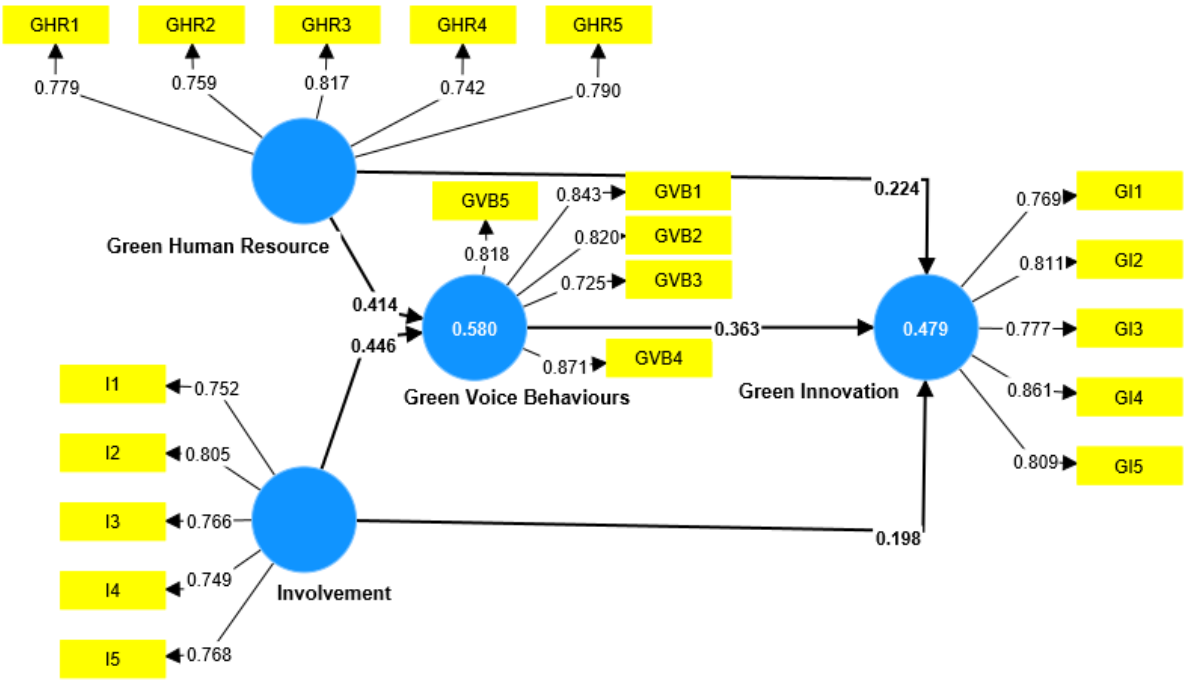

Figure 2 Finalized Measurement Model (PLS-Algorithm)

Depending on the R^2 values of 0.75, 0.50, or 0.25, endogenous latent variables (dependent variables) in the structural model may be classed as important, moderate, or weak (Hair et al., 2011). Table 3 displays the R^2 for each model. This proves that the direct effect model's R^2 is 0.479. While the mediating impact of green voice behaviors caused the R^2 of green innovation to fall to 0.472. In addition, the direct effect model's R^2 is 0.580. While the mediating effect of green voice behaviors caused the R^2 of 0.576. However, the R^2 values of all models are adequate. This is demonstrated by the R^2 value, which is displayed in the previous table. Thus, H5 is supported. Additionally, according to Indrawati and Ridwansyah (2015:172), the researchers in this study employed 95% confidence levels, which is the standard for business research. The coefficient path score for the one-tailed hypothesis must be greater than 1.65, according to the T-Statistics value. The results of the T-Statistics and Path Coefficients are displayed in Table 4.

Table 2 Discriminant Validity Testing

	Green Human Resource	Green Innovation	Green Voice Behaviours	Involvement
Green Human Resource				
Green Innovation	0.671			
Green Voice Behaviours	0.776	0.738		
Involvement	0.679	0.666	0.791	

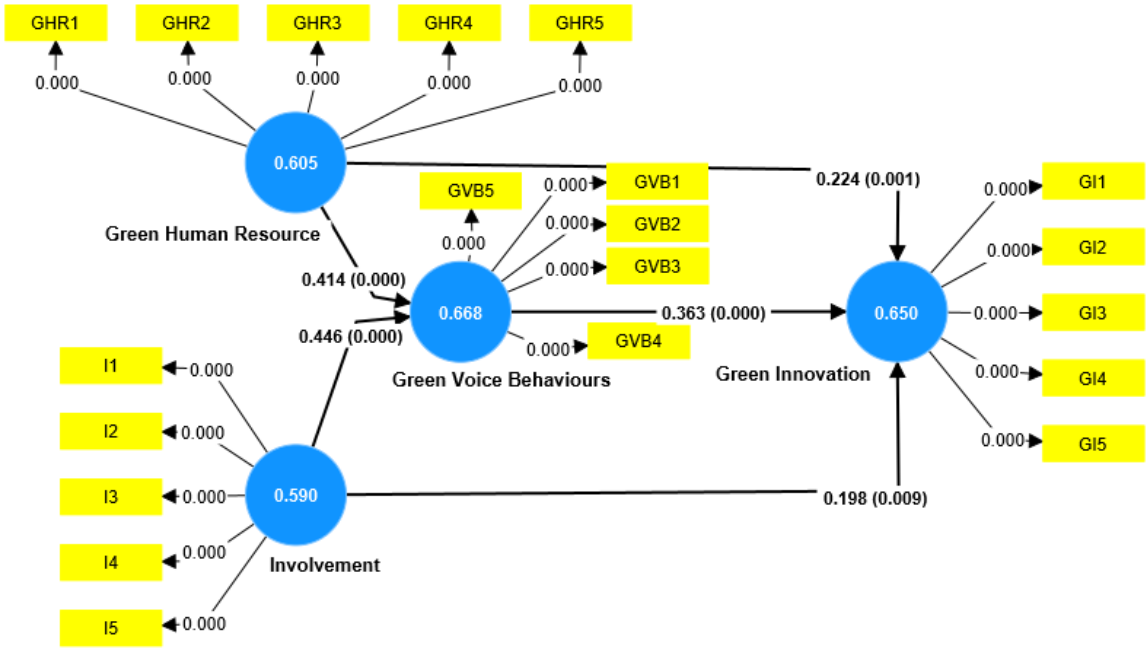

Figure 3 Hypothesis Testing (Bootstrapping)

Table 3 R Square Results

Model	Green Innovation	Green Voice Behaviors
Direct effect model	0.479	0.580
Mediating Effect Model	0.472	0.576

Table 4 shows that the calculated T value of 7.437 is greater than the necessary value of 1.65 for determining the effect of green human resource practices on green voice behaviors. Green human resource practices consequently clearly and significantly influence green voice behaviors. Thus, H_1 is accepted. In addition, the T values were 6.503, 4.499, 6.188, and 8.870 for GHR and GVB on GI, and for involvement on green innovation and green voice behaviors respectively.

Therefore, it is agreed that all study hypotheses (H_2, H_3, H_4, and H_5) are true and accepted. However, regarding the mediating effect proposed in this study, Table 5 shows the results of the indirect effects.

For H_5: Green voice behaviors mediate the effect of green human resource practices and involvement on green innovation. This is because the indirect effect as shown in Table 5 (Green Human Resource → Green Voice Behaviors → Green Innovation, and Involvement → Green Voice Behaviors → Green Innovation) are significant (B = 0.150 and 0.162 respectively, T > 1.96, P < 0.05). Thus, H5 is accepted.

7. DISCUSSION

The study on the effects of Green Human Resource (GHR) practices and employee involvement on employees' green voice behaviours towards green innovation in Jordanian manufacturing companies provides valuable insights into the field of sustainability and human resource management (Turzo et al., 2022). Previous research supports the positive impact of GHR practices on employees' environmental behaviours, such as Wang et al. (2017) who studied the Chinese manufacturing industry and Amran et al. (2014) who studied the Malaysian manufacturing industry. The study confirms the positive influence of GHR practices and employee involvement

Table 4 Path Testing

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Remark
Green Human Resource → Green Voice Behaviors	0.414	0.413	0.056	7.393	0.000	Accepted
Green Human Resource → Green Innovation	0.375	0.377	0.058	6.466	0.000	Accepted
Green Voice Behaviors → Green Innovation	0.363	0.364	0.081	4.481	0.000	Accepted
Involvement → Green Innovation	0.360	0.361	0.058	6.172	0.000	Accepted
Involvement → Green Voice Behaviors	0.446	0.449	0.050	8.920	0.000	Accepted

Table 5 Indirect Effect Results

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Green Human Resource → Green Voice Behaviors → Green Innovation	0.150	0.149	0.036	4.167	0.000
Involvement → Green Voice Behaviors → Green Innovation	0.162	0.164	0.042	3.857	0.000

on employees' green voice behaviours towards green innovation, in line with previous research emphasizing the role of human resource practices and employee involvement in promoting environmentally friendly initiatives within organizations. GHR practices create a supportive organizational environment that fosters employees' sense of responsibility towards the environment. This aligns with the social exchange theory, which suggests that employees are more willing to contribute when they perceive that their efforts are valued and reciprocated. Employee involvement plays a crucial role in fostering employees' green voice behaviors by providing them with opportunities to participate in decision-making processes. This empowers employees, enhancing their engagement, and encouraging them to contribute their ideas and suggestions for green innovation. Contextual factors such as organizational culture, industry norms, and commitment to environmental sustainability can influence the relationship between GHR practices, employee involvement, and green voice behaviors. The positive relationship between employee involvement and green voice behaviors is supported by previous research, such as Sánchez-Hernández et al. (2010) in the Spanish manufacturing sector and Schmidt et al. (2013) in a broader context. Employee involvement fosters a sense of ownership and empowerment, leading to increased engagement in environmental initiatives and a willingness to contribute to green innovation. The active involvement of employees in decision-making processes allows organizations to tap into their knowledge, expertise, and creativity, resulting in a more environmentally conscious workplace. The relationship between GHR practices and green innovation has been explored in studies conducted in different countries, such as Chinchilla et al. (2018) in Costa Rican companies and Rabechini and Monteiro (2013) in Brazilian companies. These studies highlight the positive impact of GHR practices, including employee training, development, and involvement, on the generation and implementation of innovative green ideas and practices within organizations. The present study of Jordanian manufacturing companies supports these findings, suggesting that employee involvement positively influences green innovation. While limited research specifically addresses the mediating effect of green voice behaviours, Nguyen et al. (2020) found that employees' environmental engagement mediates the relationship between GHR practices and environmental performance in Vietnamese manufacturing companies. This suggests that green voice behaviors may also play a mediating role in the relationship between GHR practices, employee involvement, and green innovation in Jordanian manufacturing companies.

8. CONCLUSION

This paper contributes to understanding of the impact of Green Human Resource (GHR) practices and employee involvement on employees' green voice behaviors and green innovation in Jordanian manufacturing companies. The findings highlight the positive influence of GHR practices and employee involvement on green voice behaviors, green innovation, and the mediating role of green voice behaviors in the relationship between GHR practices, employee involvement, and green innovation. These findings are consistent with previous research conducted in other countries, indicating the generalizability of the results. The study provides valuable insights for organizations to enhance their sustainability initiatives through the adoption of GHR practices and employee involvement. It also has implications for policymakers and regulatory bodies in promoting sustainable development. However, it is important to consider the cultural and institutional contexts when applying these findings beyond Jordanian manufacturing companies, and future research should explore different contexts to broaden understanding of the relationship between involvement and green innovation.

The study's examination of the mediating effect of green voice behaviors contributes to a better understanding of the relationship between GHR practices, green innovation, and environmental performance in Jordanian

manufacturing companies. It provides practical implications for firms to design effective GHR practices that stimulate employees' engagement in green innovation and foster a culture of sustainability. The study emphasizes the need for organizations to prioritize the implementation of GHR practices and employee involvement to drive green innovation and sustainable development. The findings also have implications for policymakers and regulatory bodies to encourage organizations to adopt GHR practices and employee involvement in promoting sustainable development. However, it is important to acknowledge the limitations of the study, including the cross-sectional design, the focus on a specific industry and context, and the use of self-reporting measures. Future research should address these limitations and explore other dimensions of sustainability and the contextual factors influencing sustainability practices in organizations.

The study contributes to the literature on sustainable human resource management by examining the relationships between GHR practices, employee involvement, green voice behaviors, and green innovation. It provides empirical evidence and theoretical support for the role of GHR practices and employee involvement in promoting employees' green voice behaviors and facilitating green innovation within organizations. The practical implications of the study highlight the significance of implementing GHR practices which promote environmental training, communication, and performance evaluation while involving employees in decision-making processes related to sustainability. However, the study has limitations, including the sampling method, the distinction between constructs in the measurement approach, the focus on a specific department within manufacturing companies, reliance on self-reporting measures, and the cross-sectional design. These limitations should be considered when interpreting the results, and future research should address these issues to strengthen the validity and generalizability of the findings.

9. THEORETICAL IMPLICATIONS

The findings of this study have several theoretical implications which contribute to existing literature on the effects of Green Human Resource (GHR) practices on employees' green voice behaviours towards green innovation. While the theoretical implications of the study are limited, they provide a foundation for further research and offer insights into the theoretical underpinnings of the relationship between GHR practices, employee involvement, and green innovation.

The theoretical implications of this study provide valuable insights into the effects of Green Human Resource (GHR) practices on employees' green voice behaviors towards green innovation. Several theoretical perspectives are supported, including social exchange theory, which emphasizes the importance of creating a supportive organizational environment through GHR practices. The study also highlights the role of employee involvement and empowerment in driving green voice behaviours, aligning with existing literature on employee engagement. The mediating role of green voice behaviours is emphasized, expanding theoretical understanding of the mechanisms through which GHR practices and employee involvement influence green innovation. Furthermore, the study underscores the integration of sustainability and HRM, calling for the incorporation of sustainability considerations into HRM strategies. The influence of contextual factors, such as organizational culture and industry norms, is also recognized, emphasizing the need for a contextualized approach to understanding the effects of GHR practices and employee involvement. The theoretical implications of this study provide a foundation for further research, including the exploration of other theoretical perspectives, the investigation of synergies between GHR practices and other sustainability initiatives, and the refinement of measurement scales. By addressing these implications, future research can advance theoretical knowledge in the field of sustainable HRM and provide valuable insights for practitioners. Additionally, comparative studies

across different industries and countries can shed light on the contextual factors that shape the effectiveness of GHR practices and employee involvement in promoting sustainable practices. Furthermore, theoretical implications can be explored by investigating the role of other theoretical perspectives in understanding the relationship between GHR practices, employee involvement, and green innovation. For example, the resource-based view (RBV) can be applied to examine how GHR practices and employee involvement contribute to the development of unique resources and capabilities that foster green innovation. The contingency theory can be explored to understand how the effectiveness of GHR practices and employee involvement varies based on situational factors such as organizational size, industry characteristics, and environmental regulations. Moreover, the study opens avenues for examining the potential synergies between GHR practices and other organizational initiatives aimed at promoting sustainability. For instance, investigating the interaction between GHR practices and corporate social responsibility (CSR) initiatives can provide insights into how these strategies can reinforce each other in driving environmentally responsible behaviour and innovation.

Theoretical implications can also extend to the measurement and operationalization of constructs related to GHR practices, employee involvement, green voice behaviors, and green innovation. Further research can focus on refining and developing more robust measurement scales to capture the multidimensional nature of these constructs. Additionally, longitudinal studies can be conducted to explore the causal relationships between these variables over time and identify potential moderators or mediators that can enhance or weaken the relationships.

Overall, the theoretical implications of this study contribute to the evolving field of sustainable HRM by enriching our understanding of the theoretical foundations underlying the effects of GHR practices and employee involvement on employees' green voice behaviors towards green innovation. By addressing the limitations and expanding on the theoretical implications discussed, future research can advance theoretical knowledge in this area and provide valuable insights for both academia and practitioners seeking to foster sustainable practices within organizations. This research can inform the development of evidence-based strategies and interventions to promote sustainability, employee engagement, and innovation in organizations across various contexts and industries.

10. PRACTICAL IMPLICATIONS

The findings of this study have several practical implications for managers, practitioners, and policymakers seeking to promote sustainable practices within organizations. By understanding the effects of Green Human Resource (GHR) practices and employee involvement on employees' green voice behaviors towards green innovation, organizations can develop strategies to enhance their sustainability initiatives and foster a culture of environmental responsibility. Firstly, organizations should consider integrating GHR practices into their HRM policies and practices. This includes incorporating environmental training programs, green performance evaluation criteria, and green communication channels to increase employees' awareness and understanding of sustainability issues. Providing resources and support for employees to engage in environmentally friendly behaviours can also reinforce the importance of sustainability within the organizational culture. Secondly, organizations should create opportunities for employee involvement in decision-making processes related to sustainability. This can be achieved through forums, committees, or suggestion systems where employees can contribute their ideas and suggestions for green innovation. By involving employees in the design and implementation of sustainability initiatives, organizations tap into their knowledge, expertise, and creativity, leading to a more environmentally conscious workplace. Thirdly, organizations should strive to create a supportive environment that encourages and rewards employees'

green voice behaviours. Recognizing and valuing employees' contributions to sustainability initiatives can enhance their sense of ownership and motivation to actively participate. Fostering a culture of open communication and collaboration can also create a platform for employees to express their ideas, concerns, and suggestions regarding green innovation. Furthermore, organizations should consider integrating green voice behaviours into performance evaluation systems. By explicitly recognizing and rewarding employees who actively engage in green voice behaviours, organizations can reinforce the importance of environmental responsibility and encourage employees to contribute their innovative ideas for green innovation. This integration aligns individual performance with organizational sustainability goals.

Collaboration with stakeholders is another important aspect. Organizations should engage with external stakeholders such as suppliers, customers, and the local community to foster sustainability collaborations. Partnering with suppliers who share similar environmental values can promote the adoption of sustainable practices throughout the supply chain. Engaging customers through green initiatives and communicating the organization's commitment to environmental responsibility can enhance the organization's reputation and attract environmentally conscious consumers. Policymakers should also recognize the importance of sustainable HRM practices and provide support and incentives for organizations to adopt and implement GHR practices effectively. This can include developing guidelines, providing training programs, and offering financial incentives to organizations that prioritize environmental sustainability in their HRM strategies. It is important to note that the practical implications mentioned above should be customized and adapted based on the specific organizational context, industry, and cultural factors. Organizations should evaluate their unique circumstances and tailor their strategies accordingly to maximize the effectiveness of GHR practices and employee involvement in promoting sustainable practices.

Overall, the practical implications derived from this study provide guidance for managers, practitioners, and policymakers to implement effective strategies that foster employees' green voice behaviours towards green innovation and contribute to sustainable development. By implementing these strategies, organizations can leverage the potential of GHR practices and employee involvement to drive green voice behaviours towards green innovation. This, in turn, can contribute to the organization's overall sustainability performance and enhance its competitive advantage in the marketplace.

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