

Article

Employee innovation performance: Exploring non-standard service relationships, psychological contracts, and knowledge sharing in green manufacturing industry development

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CITATION

Maskudi, Suseno BD, Munawir A, Firjatullah S. (2024). Employee innovation performance: Exploring non-standard service relationships, psychological contracts, and knowledge sharing in green manufacturing industry development. *Journal of Infrastructure, Policy and Development*. 8(7): 5111. <https://doi.org/10.24294/jipd.v8i7.5111>

ARTICLE INFO

Received: 8 March 2024

Accepted: 8 April 2024

Available online: 31 July 2024

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Abstract: Background: In the context of organizational innovation frameworks, knowledge plays a crucial role in sparking new ideas and bolstering innovation capabilities. Insights gathered from various sources can act as a catalyst for generating fresh concepts and pushing boundaries. Moreover, the effectiveness of innovation within an organization can be influenced by factors like employee retention and strategies in human resource management, which can either enhance or hinder the correlation between knowledge accumulation and innovation outcomes. The employee innovation performance involves a series of tasks carried out by individuals who not only possess knowledge and skills but also demonstrate consistency, active involvement in decision-making, intrinsic motivation, and a flair for innovation. **Objective:** This study endeavors to provide valuable insights into how non-standard service relationships, psychological contracts, and knowledge sharing practices can collectively impact and drive innovation in the green manufacturing sector. **Arrangement:** In the investigation of employee innovation performance within the development of the green manufacturing industry, the focus will be on exploring non-standard service relationships, psychological contracts, and knowledge sharing. These three specific facets play a pivotal role in shaping the innovation landscape in organizations operating within the realm of sustainable manufacturing. The arrangement of this study will begin by examining the impact of non-standard service relationships on employee innovation performance. By dissecting unconventional service models and their correlation with innovation behaviors, we aim to uncover novel insights that can fuel sustainable innovation practices in the green manufacturing sector. **Method:** The study adopts a quantitative methodology to collect data, concentrating on a group of employees across eight distinct outsourcing firms. This selection results in a comprehensive sample of 299 participants. For the analysis and manipulation of the data, the research utilizes Structural Equation Modeling (SEM) based on Partial Least Squares (PLS) software. This choice facilitates a meticulous and structured analysis of the data gathered, ensuring precision in the research findings. **Results:** The research findings reveal a significant and positive influence of psychological contracts on the propensity for knowledge sharing among employees. This suggests that organizations that emphasize establishing strong psychological contracts are likely to nurture a work environment conducive to the free exchange of knowledge and ideas, thus promoting a culture of collaboration and continuous improvement. Additionally, the data points to a noteworthy positive correlation between the act of knowledge sharing and the ability of an organization to offer unique, non-standard services. This underscores the role of knowledge sharing as a catalyst for innovation, indicating that organizations encouraging such exchanges are in a better position to innovate and provide services that adapt to the changing demands of customers and stakeholders. **Conclusion:** The research underscores the critical but nuanced role of knowledge sharing in driving employee innovation, especially when contrasted

with its pronounced impact on developing non-standard services. It highlights the necessity for organizations to create environments conducive to the free exchange of ideas, fostering innovation. The findings also reveal the significant influence of innovative service offerings and strong psychological contracts on boosting employee creativity and service quality, respectively. For the green manufacturing sector, these insights stress the importance of robust psychological contracts and an innovation-centric culture. Emphasizing trust, open communication, and mutual respect, alongside strategies that promote innovation and recognize employee contributions, can elevate service quality, spur sustainable growth, and secure a competitive market position. This not only advances the organization but also supports wider environmental and sustainability objectives. **Contribution:** This research enriches the academic and practical understanding of how knowledge sharing, psychological contracts, and an innovation-driven culture can collectively bolster organizational performance, especially within the context of green manufacturing, thereby contributing to the sustainability and innovation discourse.

Keywords: innovation; performance; service; psychological; contract; knowledge; sharing; green; manufacturing

1. Introduction

Improving the innovation performance of a company or institution should even be the main focus of getting special attention to employees with brilliant coaching in various aspects of expertise so that they can improve and improve the quality of service and good security (Mehale et al., 2021; Ming, 2023). Papa (2020) discourse, he advocates the significance of knowledge within organizational innovation frameworks, elucidating how insights acquired from diverse origins can serve as a driving force for spawning fresh concepts and enhancing innovation competencies. Furthermore, he explores the impact of elements such as employee retention and human resource management strategies on tempering the correlation between knowledge accumulation and innovation effectiveness.

Performance is the most important part in running the wheels of an organization or company to move it in the desired direction and also to increase target achievement in the company (Antoaneta et al., 2023). Tajeddini (2020) illustrates how employee expertise, job satisfaction, and engagement can impact a company's success in service innovation and performance. By highlighting the human factor in innovation, Tajeddini (2020) offers valuable insights for organizations aiming to enhance their competitiveness in the services market.

Employee innovation performance is defined by Ren et al. (2021) stated that employees pursue good work values and have creative performance in addition to effective behavior. Meanwhile, according to Ogbonnaya and Messersmith. (2019) stated that employees' knowledge and skills capacity provide the capacity to work well. Meanwhile, the findings of Audenaert et al. (2019) stated that regular consistent management of employee performance leading to clear understanding for employees can encourage motivation and produce innovation. Alrowwad (2020) highlights how various factors impact a company's success in service innovation and overall performance, emphasizing the crucial role of humans in the innovation process and insights are invaluable for organizations aiming to enhance competitiveness and excellence in the service market.

Thus, in this research, it is a paradigm that employee performance is a series of activities of an employee who is simultaneously equipped with knowledge, skills, consistent in working with involvement in taking decisions at work and produces good motivation and innovation.

The importance of maintaining security within the company, safeguarding assets within the scope of the company is the most dominant for guarding and checking at all times so that goods or equipment within the company area can be kept safe aman (Dwyer, 2023; Szykiewicz, 2022).

This puts security in order and will provide comfort for the company, employees, guests and other communities so that increasing security can provide progress for the company. Then the same thing is by maintaining service quality, maintaining good service according to what the company wants, employees will improve their service well to serve in accordance with company regulations (Fan et al., 2023; Machuki and Kwendo, 2023). To enhance service quality, fostering employee growth through improved mental development and effective communication is imperative. Sustaining service excellence hinges on aligning it with the company's objectives. Consequently, employees are better equipped to deliver impeccable service in accordance with established company standards (Fan et al., 2023; Machuki and Kwendo, 2023). To enhance the quality of service, it's imperative to prioritize the advancement of mental acuity and foster effective communication among employees.

When carrying out work, an employee should have high performance (Arubayi and Odiri, 2023). However, even though this is difficult to achieve, many employees even have low performance (Patel et al., 2022). Even though the employee has a lot of experience, this experience is not a guarantee. By increasing performance, companies need to carry out training and development of human resources Balanev et al. (2022). Then the provisions of the large number of outsourcing companies that sell services and display various forms of attractiveness that prioritize performance, so that they can improve the company image (Kabus et al., 2022; Ngila and Makhamara, 2023). With the protected service and security provided by the security outsourcing party, it will certainly help improve the quality of corporate image. Amoako (2021), in line with what was expressed by Eze and Joy (2023) to improve corporate image strategic management. Security guard services and security are provided with various kinds of training (Tushko et al., 2023). Individuals who excel in compliance with professional standards, having received thorough training and demonstrating expertise in their respective fields through certified qualifications, contribute to enhancing the quality of service and security provided by security personnel to the general public, employees, customers, and company stakeholders.

Characteristics of outsourcing HR employed using the outsourcing method. Outsourcing is according to Romero et al. (2020) regarding business practices where companies use third party services (outsourcing) to find workers to complete the tasks required by the company. According to Könning et al. (2019) outsourcing which is interpreted as the treatment of work that is delegated to another company and the decision holder is also from another party (outside provider). This is the treatment related to the cooperation contract. Meanwhile, according to Ishizaka et al. (2019) outsourcing is the main strategic approach in the supply chain of collaborating in the form of contractual agreements for sustainable business. In this scenario, outsourced

workers exclusively perform assignments delegated by the company, which are unrelated to the company's fundamental structure or core operations. In essence, outsourcing entails the company entrusting specific work functions, either partially or entirely, to an external party or parties through a contractual agreement.

Insourcing is a business practice where a company leader assigns tasks to a subordinate or employee within the company to complete certain tasks. According to Yang et al. (2019) insourcing is a business situation that utilizes employees within the company to do concurrent work. While Damanpour et al. (2020) insourcing is defined as business activities that rely on employees within the company. Sharma (2020) study explores how hotels have innovatively responded to pandemic challenges, and the resulting impact on their performance. Focused on the pandemic context, the research offers valuable insights into how the hotel industry adapts and evolves amidst uncertainty.

Therefore, in this study, it is posited that employee innovation performance entails a sequence of tasks carried out by employees who possess both knowledge and skills, maintain consistency in their work, actively participate in decision-making processes, and exhibit strong motivation and innovative abilities.

Enhancing previous research efforts can yield a more nuanced understanding of the myriad factors influencing employees' innovative performance, consequently offering practitioners improved guidance for fostering innovation in their workplaces (Chege, 2020; Xie, 2020). There are numerous opportunities for further exploration into the intricate relationships among factors such as leadership, motivation, and the work environment, all of which significantly influence the development of employees' innovative capabilities, as highlighted by previous research (Anand, 2020; Lee, 2020). Further investigation into these interrelationships holds promise for bridging existing gaps in the literature. In today's dynamic environment of knowledge exchange and the burgeoning green manufacturing sector, as evidenced by meta-analyses conducted by Wang (2020) and Padilla-Lozano (2022), there remains a substantial knowledge gap regarding the influence of technology adoption and organizational transformation on employee innovative performance. Hence, there is a pressing need for more refined research endeavors to delve into the effects of eco-friendly knowledge dissemination within the manufacturing domain on enhancing employee innovation capabilities. Such studies promise to unearth deeper insights, thereby enriching our comprehension of this pivotal realm.

Additionally, there remains a pressing need for more research aimed at unraveling how individual characteristics intersect with group dynamics to influence employee innovative performance. By addressing these aspects, this research endeavors to contribute to filling the void left by previous studies, thereby advancing our collective understanding of the dynamics driving innovation in organizational settings.

2. Theoretical review

2.1. Employee innovation performance

Innovation performance among employees is a critical factor in fostering the discovery of novel insights and methodologies through the exchange of knowledge,

which plays a pivotal role in propelling the success and competitive edge of organizations in the dynamic and challenging arenas of local and global markets. This assertion finds support in the scholarly contributions of Muhammed (2020), Alrowwad (2020), and Wang (2021). Alrowwad (2020) articulates that the essence of employee innovation performance lies in the synthesis of outputs generated by employees, evaluated both qualitatively and quantitatively, as they execute their designated tasks and roles. Further building on this notion, Ren et al. (2021) highlight that the ambit of employee innovation performance transcends the mere attainment of work objectives to encompass creative performance, serving as a catalytic behavior in the realization of organizational aspirations.

In the exploration of the mechanisms that bolster employee innovation performance, Ogbonnaya and Messersmith (2019) draw a connection between this performance and the capacity of employees to leverage their acquired knowledge and skills towards enhancing operational efficiency. Concurrently, Audenaert et al. (2019) provide evidence that a consistent and forward-thinking approach to performance management is instrumental in stimulating employee motivation and paving the way for innovation within the organizational fabric, underscoring the significance of aligning employee understanding with organizational visions and expectations.

Delving into more specific realms, Suseno et al. (2021) and Chatterjee (2024) scrutinize employee performance through the lenses of entrepreneurial development and competency-based compensation, respectively, spotlighting the transformative impact of recognizing individual efforts on job satisfaction and the fulfillment of set benchmarks. Moreover, the discourse by Ali et al. (2019) suggests that elevating employee performance can be achieved by nurturing an awareness of personal advancement and fostering active engagement in decision-making processes, thereby underlining the crucial role of career progression and participative governance in managerial undertakings. Echoing this perspective, Chen and Wei (2020) emphasize the imperative of leadership in cultivating symbiotic relationships between superiors and their charges as a cornerstone for bolstering performance.

In addressing the enhancement of performance through instructional and developmental interventions, Guan and Frenkel (2019) assert that the adaptability of employees to training and their behavioral adjustments are instrumental in navigating shifts and augmenting competitiveness. Thus, employee innovation performance emerges as a multifaceted construct influenced by an amalgamation of individual capabilities, motivational drives, career development opportunities, and comprehensive organizational backing aimed at nurturing creativity (Sharma, 2021).

Within the scope of this research paradigm, employee innovation performance is conceptualized as an ensemble of endeavors underpinned by knowledge, proficiency, work ethic consistency, participatory decision-making, and the cultivation of motivation and high-caliber innovations. Accordingly, the management of innovation performance calls for an integrated approach that harmonizes these diverse elements within strategic frameworks, particularly in the context of promoting sustainable practices in the manufacturing sector.

2.2. Non-standard services

Non-standard services encapsulate a scenario wherein the service provider fails to meet or falls short of the customer's expectations, standards, or anticipated benchmarks across various critical service dimensions. This discrepancy may manifest in aspects such as quality, responsiveness, reliability, communication, empathy, or other relevant service dimensions contingent upon the specific context (Hidayat and Hangtuh, 2022; Pranitasari et al., 2023). Service activities, defined as processes involving the use of intellect, senses, and physical capabilities with or without tools to fulfill desired outcomes in the form of goods or services (Budiarto, 2022), when misaligned with customer expectations, lead to non-standard service delivery.

Non-standard services arise from a service provider's inability or unwillingness to align their service delivery with the established or anticipated standards and expectations of the customer (Pundenswari, 2017). This misalignment could encompass deficiencies in quality, efficiency, safety, or other pivotal aspects of service provision (Chen et al., 2020; Dong et al., 2019; Wang et al., 2019). The occurrence of non-standard services is marked by a customer's perception of a gap between what is promised or expected and what is actually delivered, encompassing failures in meeting expected quality, reliability, responsiveness, or other significant service dimensions (Nguyen et al., 2018; Zhang et al., 2020).

This research paradigm posits that non-standard services transpire when the service provider does not meet or align with the expectations, standards, or benchmarks set by the customer. This encompasses discrepancies across various service dimensions, including but not limited to quality, responsiveness, reliability, communication, and empathy, which are deemed critical by the customer (Liu et al., 2021; Sun et al., 2022). The identification and analysis of such service discrepancies are pivotal for understanding and enhancing customer service experiences, thereby contributing to the broader discourse on service quality and management in the academic and practical spheres.

2.3. Psychology contract

Liu (2020) emphasized the significance of psychological contract fulfillment in boosting freelancers' task performance, noting that organizational identification mediates this relationship. This finding offers valuable insights into the factors affecting freelancers' performance within the sharing economy, and it holds potential implications for human resource management and organizational practices in today's work environment. The psychological contract refers to an implicit agreement between an employee and their employer, defining the mutual obligations and expectations that govern their relationship beyond the formal employment contract (Russo, 2020; Wong, 2023). In broadening the perspective, Phuong (2020) and Agarwal (2021) contribute to distinguishing between a legally binding employment contract, which outlines the mutual obligations between employees and the company, and the concept of the psychological contract, which holds the potential to significantly impact employee performance.

Scholars have offered various interpretations of the psychological contract. Maia and Bastos (2019) describe it as the employment relationship an employee has with

their workplace, emphasizing its basis in mutual expectations and obligations. Kutaula et al. (2020) view the psychological contract as an engagement contract characterized by mutual exchange and reciprocity, supporting its primary role as an exchange structure within the employee-employer relationship. Soares and Mosquera (2019) articulate the psychological contract as a series of expectations established during the initial recruitment and selection phases and evolving throughout the employee's tenure with the organization.

Research by Mensah (2019) defines the psychological contract in terms of individual beliefs about mutual agreements, communicated practices to talented employees to foster a better understanding of organizational signals. Naidoo et al. (2019) focus on academic employees, highlighting the psychological contract's impact on academic staff engagement and responsibility within universities. Kiazad et al. (2019) present the psychological contract as a reciprocal arrangement between employees and institutions, or as compensation for the organization demanding employees' commitment, effort, and time towards achieving corporate goals. Similarly, Saefudin and Suseno (2019) identify it as a series of formal or informal agreements binding the employment relationship to achieve specific objectives and provide mutual benefits. Yusuf and Suseno (2020) relate business performance improvement processes to the expansion of competitive agility through sustained innovation, indicating a broader application of the psychological contract concept.

From the viewpoints of the scholars mentioned, it can be inferred that a psychological contract represents an individual's implicit commitment to honor obligations beyond what is explicitly outlined in the formal employment agreement. This fosters a reciprocal connection that influences the dynamics of employee-company relationships, facilitating progress and contributing to the attainment of organizational objectives.

2.4. Knowledge sharing in green manufacturing industry development

In the realm of business process development within the manufacturing industry, the act of sharing knowledge is construed as a sequence of constructive endeavors aimed at diffusing or transposing insights from individuals, groups, or organizations. Zhou (2020) seminal findings underscore the pivotal role of such dynamics in expediting sustainable innovation. They shed light on the critical significance of equity and cooperation, elucidated through the conduits of fairness perceptions, relational depth, and knowledge dissemination, all integral in propelling green innovation across supply chains to realize sustainable development objectives.

Moreover, Song (2020) research provides compelling evidence that the exchange of green knowledge assumes a vital stance in propelling sustainable innovation, particularly when catalyzed by stakeholder pressures. This study unveils crucial insights into the pivotal role of collaboration and the augmentation of absorptive capacities to foster efficacious green innovation endeavors.

Further bolstering this discourse, Pan (2021) posits that an elevated level of social trust can serve as a catalyst for corporate green innovation. Such findings underscore the intrinsic significance of social dynamics in steering sustainable innovation initiatives within corporate realms, furnishing stakeholders with invaluable insights to

expedite the transition towards a greener economic paradigm. Additionally, insights gleaned from the research by Ren et al. (2021) accentuate the instrumental role of knowledge-sharing as a mediator, facilitating a conducive work environment conducive to cultivating creative work values. Similarly, Kularajasingam et al.'s (2022) findings provide empirical substantiation for the premise that knowledge-sharing, coupled with individual behaviors and social acumen, catalyzes the development of innovative work processes within academic domains.

Furthermore, Olan et al. (2019) research underscores the transformative potential of sharing knowledge pertaining to environmentally sustainable practices, which not only shapes organizational culture but also underscores the instrumental role of integrated knowledge-sharing techniques in this process. Shifting focus to the construction sector, Bohari (2020) delves into the significance of stakeholder values as pivotal in fostering green orientation within procurement practices. This underscores the imperativeness of comprehending and integrating stakeholder values to propel sustainable procurement endeavors within the construction sector.

Moreover, Singh et al. (2021) accentuates the transformative potential of knowledge-sharing in influencing open innovation paradigms within organizational frameworks. Concurrently, Yue et al.'s (2022) research underscores the transformative potential of knowledge-sharing within diverse esports industry alliances, invigorating knowledge innovation among members and organizations alike. Finally, Yu (2022) successful development of a valid measurement tool for assessing green knowledge management heralds' significant implications for understanding and advancing sustainable knowledge management practices.

In sum, these findings collectively underscore the centrality of knowledge-sharing in driving sustainable innovation within business process development, particularly within the manufacturing sector, underscoring the importance of collaboration, cooperation, and the augmentation of knowledge-sharing capacities. Drawing upon an array of empirical insights from esteemed scholars, the following hypotheses are proposed:

H₁: It is hypothesized that psychological contracts wield a significant influence on knowledge sharing within the domain of green manufacturing industry development.

H₂: It is hypothesized that knowledge sharing within the sphere of green manufacturing industry development exerts a tangible impact on non-standard services.

H₃: It is postulated that knowledge sharing within the green manufacturing industry significantly shapes employee innovation performance.

H₄: It is hypothesized that non-standard services play a pivotal role in influencing employee innovation performance.

H₅: It is postulated that psychological contracts assume a central role in shaping non-standard services within the context of the green manufacturing industry development.

H₆: It is conjectured that psychological contracts exert a discernible influence on employee innovation performance within the green manufacturing industry development.

The research framework is depicted in **Figure 1**.

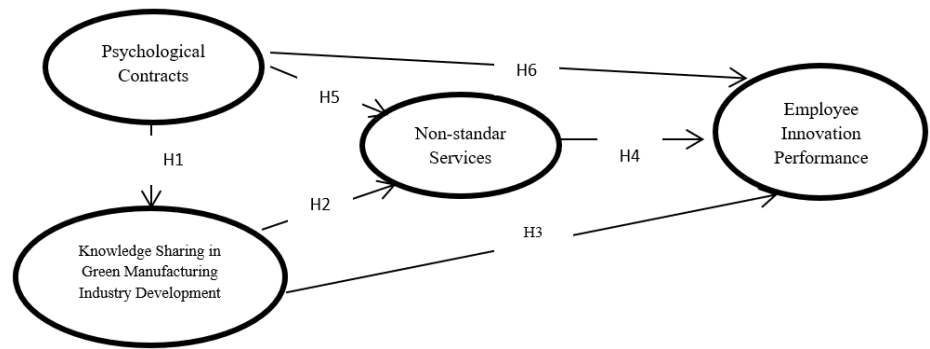


Figure 1. The research framework.

3. Methods

This research adopts a quantitative approach with a correlational framework, linking exogenous variables (psychological contracts/X1 and knowledge sharing within the sphere of green manufacturing industry development/X2) with endogenous variables (employee innovation performance/Z), both directly and through intervening variables (non-standard services/Y). According to the latest data available for June 2023 (Manpower Ministry of Tangerang Regency, Indonesia, 2023), the total number of employees across 17 manufacturing companies in Tangerang Regency, Indonesia, is 1950 individuals. To determine the sample size for Structural Equation Modeling (SEM) analysis, guidelines provided by Ghazali (2021) are followed: 1) a sample size of 100–300 is recommended for Maximum Likelihood Estimation, 2) the minimum number of responses required is 250 respondents. 3) sample size depends on the number of parameters being estimated, typically calculated using the formula $(k \times k + 1)/2$ or 10 times the number of parameters estimated.

Given that this research comprises 30 indicators, the minimum sample size required is determined to be $(30 \times 30 + 1)/2 = 421$ or $30 \times 10 = 300$, thus necessitating a sample size ranging from 300–450 respondents. The author opts for a maximum sample size of 300 respondents to mitigate the risk of collecting invalid samples. The Proportional Random Sampling technique is employed for participant selection, as it is suitable for relatively homogeneous populations (Ghozali, 2019). Identifying characteristics based on the respondent’s company or place of work simplifies the research process. For a detailed breakdown, refer to **Table 1**.

Table 1. The respondent’s company.

Number	Company	Number of Respondents	Percentage (%)
1	Lion Grup, Ltd.	55	18.4
2	Esa Garda Pratama, Ltd.	81	27.1
3	Tri Tunggal Buana Sejahtera, Ltd.	24	8.0
4	Berkah Surya Cermelang, Ltd.	26	8.7
5	Rajawali Trans Multimas, Ltd.	22	7.4
6	Panukal Corporation, Ltd.	28	9.4
7	Cipta Kerja Lebak, Ltd.	13	4.3
8	Azka Multi Karya, Ltd.	50	16.7
Amount		299	100%

Inferential analysis is conducted using Partial Least Square-Structural Equation Modeling (PLS-SEM), chosen for its suitability in testing the predicted relationships between variables in the model. Estimates of γ and λ are computed using the PLS-SEM version 3.2.7 program, employing a resampling with bootstrapping method developed by Ghazali (2021). Bootstrapping generates multiple estimates, including weight estimates, inner and outer model estimates, as well as means and location parameters (constants).

4. Results

4.1. Deskriptif

The analysis of the data, derived from a questionnaire survey completed by 299 individuals, reveals significant demographic trends among the respondents. The predominant age group is individuals aged 31 to 40 years, who constitute 43.5 percent of the total respondents, indicating a significant concentration of participants within this age range. Following closely, the 20 to 30-year age group comprises 41.1 percent of the respondents, underscoring the youthful demographic engagement in the survey. Conversely, individuals aged 41 to 50 years represent the least engaged demographic, accounting for a mere 15.4 percent of the total participants. This distribution highlights the varying levels of participation among different age groups in the study.

4.2. Initial Partial Least Square (PLS) model

Based on **Figure 2**, it is clear that there are signs and codes for each variable and the indicators.

This study seeks to evaluate the hypothesis through the application of the Partial Least Square (PLS) analysis method, utilizing the Smart PLS 3.2.9 software. The subsequent phase of this research is substantiated by the PLS model's schematic representation are explained in **Table 2**.

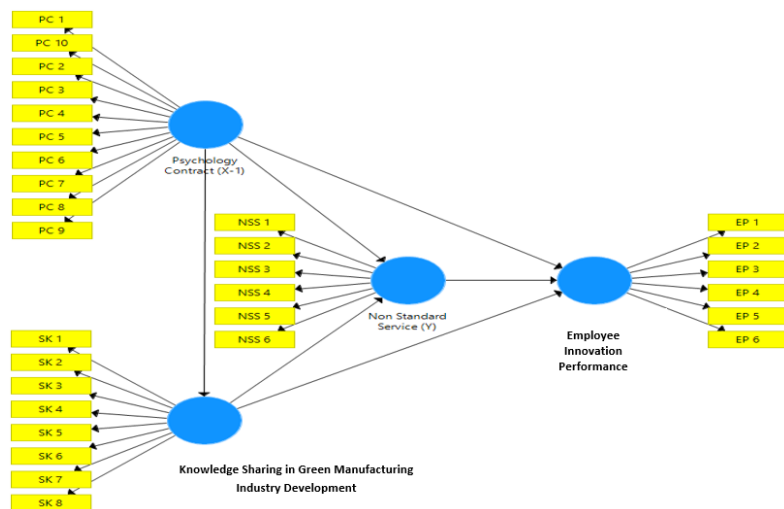


Figure 2. Initial structural design model.

Table 2. Signs and codes for each variable and the indicators are explained.

Variable Z		Variable Y	
Employee Inovation Performance (EP)		Non-Standard Services (NSS)	
EP 1	Adverb of time	NSS 1	Reliability
EP 2	Time utilization	NSS 2	Responsiveness
EP 3	Willingness to join the organization	NSS 3	Guarantee
EP 4	Responsibilities at work	NSS 4	Empathy
EP 5	Ability to respond to complaints	NSS 5	Permanent part time
EP 6	Ability to advance the company	NSS 6	Part time is not fixed
Variable X₁		Variable X₂	
Psychology Contract (PC)		Knowledge Sharing in Green Manufacturing Industry Development	
PC 1	Company interests	SK 1	Knowledge Sharing in Green Manufacturing
PC 2	Putting the company first	SK 2	Offer an opinion in Green Manufacturing
PC 3	Work	SK 3	New knowledge in Green Manufacturing
PC 4	Wages	SK 4	Utilize technology in Green Manufacturing
PC 5	Time	SK 5	Gather new knowledge in Green Manufacturing
PC 6	Contract	SK 6	Use of new knowledge in Green Manufacturing
PC 7	Experience in the field of science	SK 7	Personal training in Green Manufacturing
PC 8	Office experience	SK 8	Corporate training in Green Manufacturing
PC 9	Field experience		
PC 10	Organizational experience		

4.3. Convergent validity test results

Based on **Figure 2** output PLS Algorithm which has been processed to produce the number of numbers obtained for each indicator, each variable will be presented in the **Table 3**.

Table 3. Outer loading.

Konstruk	Psychology Contract	Knowledge Sharing	Non-Standard Services	Employee Performance
EP 1				0.931
EP 2				0.921
EP 3				0.937
EP 4				0.926
EP 5				0.930
EP 6				0.937
NSS 1			0.946	
NSS 2			0.922	
NSS 3			0.947	
NSS 4			0.933	
NSS 5			0.947	
NSS 6			0.891	
KS 1		0.936		
KS 2		0.929		

Table 3. (Continued).

Konstruk	Psychology Contract	Knowledge Sharing	Non-Standard Services	Employee Performance
KS 3		0.930		
KS 4		0.940		
KS 5		0.940		
KS 6		0.908		
KS 7		0.935		
KS 8		0.934		
PC 1	0.921			
PC 2	0.940			
PC 3	0.926			
PC 4	0.903			
PC 5	0.945			
PC 6	0.805			
PC 7	0.941			
PC 8	0.910			
PC 9	0.959			
PC 10	0.915			

Source: SmartPLS.3 2023 processing data.

Building on the insights gleaned from **Table 3**, it becomes clear that the average Loading Factor for each manifest variable under investigation surpasses the threshold of 0.7. This outcome strongly indicates that the manifest variables employed in this study not only meet but exceed the reliability standards, affirming their appropriateness for further analysis. This robust level of reliability underscores the potential effectiveness and precision of the manifest variables in contributing to the research findings.

4.4. Bootstrapping results

The bootstrap results presented in the **Figure 3** highlight the relationships between various constructs in the context of green manufacturing industry development. In a recent study examining the dynamics within the green manufacturing industry, compelling evidence was found highlighting the significant role of psychological contracts in enhancing knowledge sharing among employees.

With a strikingly high path coefficient of 0.965, this relationship not only showcases the power of psychological contracts in fostering an environment conducive to knowledge exchange but also underpins the reliability of these findings with a statistical certainty near absolute, given the *P*-value of 0.000.

Further analysis revealed the ripple effects of this knowledge sharing, notably its considerable contribution to the provision of non-standard services within the industry, evidenced by a path coefficient of 0.675. This indicates a thriving culture of innovation and adaptation, further bolstered by the undeniable statistical significance of these results.

The study also ventured into the realms of employee performance and innovation. While knowledge sharing positively impacts employee performance, as denoted by a

path coefficient of 0.285, it's the influence on innovation that truly stands out. The provision of non-standard services, a direct outcome of robust knowledge sharing practices, significantly boosts employee innovation performance, a fact underscored by a path coefficient of 0.502 and unequivocal statistical support. Lastly, the investigation delved into how psychological contracts directly affect the provision of non-standard services, revealing a positive relationship albeit with a lesser magnitude compared to its impact on knowledge sharing. This nuanced insight, supported by a path coefficient of 0.311, adds another layer to the intricate web of interactions driving innovation and performance in the green manufacturing sector.

Together, these findings illuminate the critical importance of nurturing strong psychological contracts and promoting knowledge sharing as catalysts for innovation and enhanced service delivery within the green manufacturing industry.

The calculation of path coefficients evaluation, hypothesis testing, and mediation testing, all of which are extensively explained in **Table 4**.

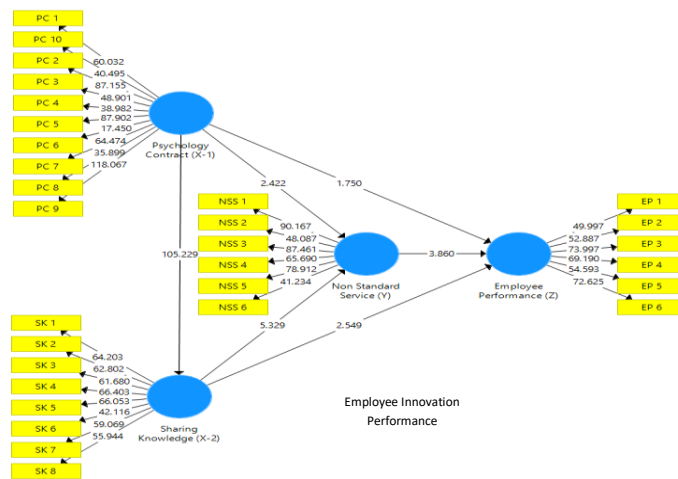


Figure 3. Path coefficients evaluation.

Source: SmartPLS.3 2023 Processing Data, Knowledge Sharing in Green Manufacturing Industry Development.

Table 4. Hypothesis testing.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P-Values	Meaning
Psychology Contract (X ₁) → Knowledge Sharing in Green Manufacturing Industry Development (X ₂)	0.965	0.965	0.009	105.229	0.000	Significant
Knowledge Sharing in Green Manufacturing Industry Development (X ₂) → Non-Standard Service (Y)	0.675	0.650	0.127	5.329	0.000	Significant
Knowledge Sharing in Green Manufacturing Industry Development (X ₂) → Employee Innovation Performance (Z)	0.285	0.304	0.112	2,549	0.006	Significant
Non-Standard Service (Y) → Employee Innovation Performance (Z)	0.502	0.504	0.130	3.860	0.000	Significant
Psychology Contract (X ₁) → Non-Standard Service (Y)	0.311	0.336	0.128	2.422	0.008	Significant
Psychology Contract (X ₁) → Employee Innovation Performance (Z)	0.196	0.175	0.112	1.750	0.004	Significant

Source: SmartPLS.3 2023 Data Processing.

The data presented in **Table 4** outline the hypothesis testing results regarding the impact of psychological contracts on knowledge sharing within the green manufacturing industry, and how these, in turn, influence non-standard service provision and employee innovation performance. Here's a deeper interpretation:

H₁: Psychological Contract → Knowledge Sharing in Green Manufacturing Industry Development: With an original sample (*O*) value of 0.965 and a minimal standard deviation, this relationship shows a very high positive effect of psychological contracts on knowledge sharing within the industry. The T-statistics value of 105.229 and a *P*-value of 0.000 confirm this relationship is statistically significant with an almost certain probability that the observed effect is not due to chance.

H₂: Knowledge Sharing in Green Manufacturing Industry Development → Non-Standard Service: This demonstrates a substantial positive effect (*O* = 0.675) of knowledge sharing on the provision of non-standard services, validated by the *T*-statistics (5.329) and a *P*-value of 0.000. The results indicate that as knowledge sharing increases, so does the capacity for delivering non-standard services.

H₃: Knowledge Sharing in Green Manufacturing Industry Development → Employee Innovation Performance: Here, the positive relationship (*O* = 0.285) signifies that knowledge sharing positively impacts employee innovation performance, though the effect is less pronounced than on non-standard services. The significance of this relationship is confirmed by a *P*-value of 0.006.

H₄: Non-Standard Service → Employee Innovation Performance: The original sample value of 0.502 indicates a significant positive effect of non-standard services on employee innovation performance. The statistical significance is underscored by a *P*-value of 0.000, suggesting a strong likelihood that improving non-standard services enhances employee innovation.

H₅: Psychological Contract → Non-Standard Service: This relationship, with an original sample value of 0.311, indicates a positive effect, albeit moderate, of psychological contracts on non-standard services. The statistical analysis (*P*-value of 0.008) confirms the significance of this relationship, suggesting that the psychological contract has a broader impact beyond direct knowledge sharing.

H₆: Psychological Contract → Employee Innovation Performance: An original sample value of 0.196 points to a direct positive impact of psychological contracts on employee innovation performance. Although this is the weakest relationship among those tested, with a *P*-value of 0.004, it remains statistically significant. This indicates that psychological contracts, apart from their indirect effects through knowledge sharing and service provision, have a direct positive relationship with innovation performance.

The results collectively highlight the critical role of psychological contracts in fostering an environment conducive to knowledge sharing, which in turn significantly impacts both service innovation and employee innovation performance in the green manufacturing industry. These findings suggest that managers and policymakers within this sector should prioritize the development and maintenance of strong psychological contracts to drive innovation and service quality.

5. Discussion

Expanding upon the findings related to hypothesis H₁, which posits a strong positive relationship between psychological contracts and knowledge sharing in the green manufacturing industry, several nuanced discussions emerge. The statistical results, characterized by an original sample value (*O*) of 0.965, a minimal standard deviation, and a compelling *T*-statistics value of 105.229, offer a robust foundation for a deeper exploration of this relationship's implications and potential mechanisms.

The significance of these findings lies not only in their statistical robustness but also in their practical implications for organizational behavior and strategy in green manufacturing contexts (Agarwal, 2021; Syaefudin et al., 2019). The psychological contract, an unwritten set of expectations between employees and employers, plays a pivotal role in shaping employee behavior and attitudes. In the context of green manufacturing, where innovation and continuous improvement are crucial, understanding the mechanisms through which psychological contracts influence knowledge sharing becomes essential. The very high positive effect suggests that employees who perceive their psychological contract to be fulfilled are more likely to share valuable knowledge with their peers, thereby contributing to collective learning and innovation (Phuong, 2021; Suseno and Mukhlis, 2023).

Wong (2023) stated a fulfilled psychological contract fosters an environment of trust and openness, encouraging employees to share insights and ideas without fear of exploitation or negative repercussions. This environment is crucial for innovative industries like green manufacturing, where shared knowledge can lead to breakthroughs in sustainable practices (Liu, 2020; Song, 2020). Employees who feel that their employers are upholding their end of the psychological contract are likely to feel more valued and, consequently, more motivated and engaged with their work. Concerning the research findings by Pan (2021) This heightened engagement can manifest in increased willingness to share knowledge and collaborate with colleagues. The findings underscore the importance of an organizational culture that prioritizes psychological contracts. Such a culture is likely to be more adaptive and innovative, as satisfied and engaged employees contribute to a dynamic knowledge-sharing ecosystem, driving the development of green manufacturing (Russo, 2020).

The significant relationship between psychological contracts and knowledge sharing in the green manufacturing industry underscores the necessity for strategic human resource practices that nurture these contracts. By fostering an environment that promotes trust, engagement, and continuous learning, organizations can unlock the full potential of their workforce, driving innovation and sustainability in the green manufacturing sector.

The findings from Hypothesis H₂, investigating the influence of knowledge sharing within the green manufacturing sector on the delivery of non-standard services, reveal a significant positive correlation. An original sample value of 0.675 highlights the critical role of knowledge sharing as a catalyst for service innovation and customization in green manufacturing. The robust *T*-statistics of 5.329 and a *P*-value of 0.000 strongly validate the statistical significance of this relationship, indicating a negligible likelihood that these results occurred by chance. This discussion further

explores the implications, mechanisms, and strategic considerations of this relationship, drawing on literature such as Suseno (2019).

Organizational agility, enhanced by knowledge sharing, allows companies to quickly adapt to market changes and customer demands, a capability vital for offering non-standard services that often require swift resource and process reconfiguration. Muhammed (2020) highlights the importance of agility in this context.

Furthermore, knowledge sharing cultivates a collaborative environment that promotes the merging of diverse ideas and expertise, essential for creating unique service offerings. Anand (2020) notes the value of such an environment in developing non-standard services. Knowledge sharing among employees and across departments can lead to more innovative solutions and tailored services, potentially resulting in unique, sustainable products or services that cater to specific customer needs and distinguish a company in the market. Suseno (2019) underscores this potential for differentiation through knowledge sharing.

Strategies to bolster knowledge sharing include implementing or improving knowledge management systems and fostering a culture that prizes and rewards knowledge sharing and collaboration, thereby boosting service innovation. Tajeddini (2020) emphasizes the significance of organizational culture in enhancing knowledge sharing outcomes. Additionally, equipping employees with the necessary skills for effective knowledge sharing and innovation through training and development opportunities is crucial. Mahpudin and Suseno (2022) argue that understanding and leveraging the mechanisms by which knowledge sharing affects service provision can significantly increase a company's competitive edge and contribute to sustainable development. This refined understanding highlights knowledge sharing's pivotal role in enabling green manufacturing companies to innovate and customize their service offerings efficiently.

The examination of Hypothesis H₃ reveals the intricate relationship between knowledge sharing in green manufacturing and its impact on employee innovation performance. The analysis presents a positive path coefficient of 0.285, highlighting that while knowledge sharing beneficially influences employee innovation capabilities and performance, its effect is comparatively subdued next to its influence on non-standard service provision. The statistical validation of this finding, with a *P*-value of 0.006, emphasizes the robustness of the evidence.

The somewhat moderate effect on employee innovation performance may stem from the complex nature of innovation at the individual level, potentially shaped by a variety of elements beyond mere knowledge sharing. Factors such as organizational culture, individual characteristics like intrinsic motivation and creativity, and the provision of resources and support for innovation endeavors within the company are pivotal (Alrowwad, 2020; Sharma, 2021). Nevertheless, the essential role of the positive link between knowledge sharing and employee innovation performance cannot be overstated. This connection suggests that the spread of knowledge within an organization nurtures a fertile ground for the birth, sharing, and application of innovative ideas, fostering a culture inclined towards continuous improvement and innovation (Xie, 2020).

For leaders and managers in the green manufacturing sector, the implications of these findings are significant. Strategies aimed at bolstering innovation performance

should extend beyond merely promoting knowledge sharing to encompass the entire ecosystem affecting employee innovation. This could involve instituting structured innovation processes, offering training and development in creative thinking and problem-solving, and cultivating a supportive culture that values experimentation and accepts failure as an integral part of the innovation journey (Lee, 2020; Suseno et al. 2019).

Furthermore, this insight highlights the criticality of embedding knowledge sharing within the strategic framework of green manufacturing initiatives. In doing so, organizations can tap into the collective intelligence of their workforce to not only refine service offerings but also amplify the innovative prowess of their employees, thereby securing a sustainable competitive edge and advancing the overarching aims of sustainability and environmental responsibility in the manufacturing domain (Suseno and Dwiatmadja, 2016).

The analysis of Hypothesis H₄ delves into the effect of non-standard service provision on employee innovation performance within the green manufacturing sector. A notable original sample value of 0.502 signifies a substantial positive influence, indicating that the enhancement of non-standard services can significantly elevate the innovation performance among employees. The unmistakable statistical significance of this relationship, highlighted by a *P*-value of 0.000, points to a robust connection between the development of innovative, tailored services and the stimulation of employee innovation capabilities. Non-standard services, by their nature, require creative thinking and a departure from routine solutions, thereby inspiring employees to think innovatively. This demand for creativity not only motivates employees to explore new ideas but also fosters an environment where innovation is not just encouraged but required for the development and delivery of these services.

The process of developing non-standard services often involves problem-solving in uncharted territories, which can significantly contribute to employees' learning and skill development (Singh, 2021). This experiential learning enhances employees' ability to innovate by expanding their knowledge base and improving their problem-solving skills. Non-standard service provision typically necessitates collaboration across different departments and disciplines within an organization. Regarding this Ren et al. (2021) argue that cross-pollination of ideas and experiences fosters a culture of innovation, as employees are exposed to diverse perspectives and approaches that can spark new ideas and innovative solutions. Engaging employees in the creation and delivery of non-standard services can lead to a greater sense of ownership and empowerment. This emotional investment can be a powerful motivator for innovation, as employees are more likely to contribute creatively when they feel personally connected to the outcomes of their work (Patel et al., 2022; Suseno and Basrowi, 2023). From a strategic perspective, the focus on non-standard services not only differentiates a company in the marketplace but also demands a continuous adaptation to customer needs and market trends. This dynamic environment necessitates a constant flow of innovation from employees to keep the company at the forefront of market trends and customer preferences (Olan et al., 2019).

The findings underscore the pivotal role of non-standard service provision in catalyzing employee innovation performance in the green manufacturing sector. For

organizations looking to harness the full potential of their workforce's innovative capabilities, investing in the development of non-standard services offers a promising pathway. Not only does it enhance competitive advantage through differentiation, but it also cultivates a workforce that is agile, creative, and continuously driven to innovate. This dual benefit of non-standard service provision underscores its strategic importance in fostering a culture of innovation and sustaining long-term growth in the rapidly evolving landscape of green manufacturing.

The exploration of Hypothesis H₅ uncovers the nuanced dynamics between the psychological contract and the provision of non-standard services within the green manufacturing industry. An original sample value of 0.311, although moderate, unmistakably indicates a positive influence of psychological contracts on the enhancement and development of non-standard services. The statistical rigor provided by a *P*-value of 0.008 firmly establishes the significance of this relationship, revealing that psychological contracts exert an influence that extends well beyond the realms of direct knowledge sharing, permeating deeper into the operational aspects of service innovation and delivery.

The evidence of the findings Chege (2020) is strengthening A strong psychological contract, characterized by mutual expectations, respect, and trust between the employer and employees, fosters a heightened sense of commitment and engagement. This heightened engagement motivates employees to go beyond their basic job requirements and contribute to innovative service solutions that are not standardized, thereby driving the development of non-standard services (Suseno et al., 2022).

Cropanzano (2022) argues that emphasizing value alignment, employee recognition, and support for personal and professional growth can create an environment that nurtures creativity and innovation. When employees feel valued and supported, they are more likely to engage in creative problem-solving and propose innovative solutions, thereby contributing to the pool of ideas from which non-standard services can emerge. Encouraged by the trust and security nurtured through a robust psychological contract, as suggested by Russo (2020) and Suseno et al. (2023), employees may feel empowered to take calculated risks and explore new ideas without the looming fear of facing adverse consequences for failure. This culture of experimentation becomes indispensable for fostering the development of non-standard services, which frequently demand breaking away from conventional approaches and embracing a willingness to explore uncharted paths.

A positive psychological contract, as proposed by Wong (2023), fosters open communication and collaboration throughout the organization. Such an atmosphere encourages the exchange of tacit knowledge and best practices, which are indispensable for generating ideas and implementing non-standard services. Collaboration, fueled by robust psychological contracts, dismantles organizational silos, allowing for the integration of diverse insights and expertise into service design and delivery (Suseno and Dwiatmadja, 2016; Saefudin et al., 2019). Additionally, Wong (2023) emphasizes that psychological contracts aligning employee goals with organizational objectives ensure not only operational engagement but also strategic alignment with the company's vision for innovation and service differentiation. This alignment, highlighted by Pozo-Herce (2021), streamlines the adaptation of service

offerings to changing market demands, thus sustaining agility and competitive advantage through non-standard services.

Nurturing a conducive environment for non-standard service development within the green manufacturing sector hinges on the pivotal role of psychological contracts, as highlighted by Liu (2020). Wong (2023) underscores that investing in positive psychological contracts yields multifaceted benefits, propelling service innovation and differentiation beyond mere employee satisfaction and retention. Phuong (2021) emphasizes this strategic orientation towards psychological contracts as a catalyst for service innovation, emphasizing the interconnectedness of organizational culture, employee motivation, and operational excellence in securing sustainable competitive advantage.

The examination of Hypothesis H₆ unveils the intricate interplay between psychological contracts and employee innovation performance in the green manufacturing industry. Despite its modest initial value of 0.196, the direct positive impact of psychological contracts on employee innovation, affirmed by a significant *P*-value of 0.040, underscores their influential role beyond indirect effects mediated through knowledge sharing and service provision.

Agarwal (2021) posits that well-defined and mutually fulfilling psychological contracts significantly enhance intrinsic motivation, empowering employees to engage in innovative behaviors and contribute novel ideas. Chege (2020) further reinforces this notion, highlighting how a positive psychological contract inspires discretionary effort in creative endeavors.

A robust psychological contract signals the organization's commitment to fostering innovation by providing necessary resources and a supportive environment, as noted by several authors. Wang (2021) emphasizes the importance of psychological safety in facilitating open communication and collaborative problem-solving, crucial for innovative ideation and implementation. Additionally, alignment between employee efforts and organizational objectives, particularly in innovation and continuous improvement, enhances employee engagement and innovation identification, as articulated by various sources. Noe et al. (2017) and Chatterjee (2024) stresses the adaptability cultivated through strong psychological contracts, enabling employees to navigate innovation-driven environments with resilience and creativity. Despite being the weakest among examined relationships, the direct impact of psychological contracts on employee innovation performance underscores their strategic significance, as reiterated by Wong (2023). Focusing on cultivating positive psychological contracts can foster a culture of innovation, leveraging the full potential of employees for sustainable growth and competitive advantage in the green manufacturing sector.

6. Conclusion

The analysis of the data presents compelling evidence of the pivotal role that psychological contracts play in fostering a culture of innovation and excellence within the green manufacturing industry. The findings demonstrate a robust positive effect of psychological contracts on knowledge sharing among employees. This indicates that organizations that prioritize the development of strong psychological contracts are

more likely to create an environment where employees freely exchange knowledge and ideas, thereby fostering a culture of collaboration and continuous learning. Moreover, the results establish a significant positive relationship between knowledge sharing and the provision of non-standard services. This highlights the importance of knowledge sharing as a driver of innovation within organizations, suggesting that those that promote knowledge exchange are better positioned to develop and deliver innovative services that meet the evolving needs of customers and stakeholders.

Furthermore, while the impact of knowledge sharing on employee innovation performance may be slightly less pronounced than its effect on non-standard services, it still underscores the critical role of knowledge exchange in driving individual innovation capabilities. This emphasizes the importance of creating opportunities for employees to share insights and expertise, thereby empowering them to contribute creatively to the organization's goals. Additionally, the analysis reveals a significant positive effect of non-standard services on employee innovation performance, emphasizing the role of innovative service offerings in inspiring and facilitating employee creativity. This highlights the importance of organizations investing in the development of non-standard services as a means to unlock the innovative potential of their workforce. Although the effect of psychological contracts on non-standard services may be moderate, the statistical significance suggests that they contribute to creating an environment conducive to the development of innovative services. This underscores the importance of organizations fostering positive psychological contracts with their employees as a strategic approach to driving innovation and enhancing service quality. Despite being the weakest relationship among those tested, the results confirm a direct positive impact of psychological contracts on employee innovation performance. This underscores the significance of psychological contracts in directly influencing employees' innovative behaviors and outcomes, further emphasizing their role as a driver of organizational innovation and success.

The implications of these findings are significant for organizations within the green manufacturing industry. Firstly, it underscores the importance of prioritizing the development and maintenance of strong psychological contracts. Organizations should focus on fostering trust, communication, and mutual understanding between employers and employees to create an environment conducive to innovation and knowledge sharing. Furthermore, managers and policymakers can use these insights to formulate strategies aimed at fostering a culture of innovation and excellence within their organizations. This may involve implementing initiatives to promote collaboration, providing resources for training and development, and recognizing and rewarding innovative contributions from employees. By investing in psychological contracts and fostering a culture of innovation, organizations in the green manufacturing industry can enhance service quality, drive sustainable growth, and gain a competitive advantage in the marketplace. This not only benefits the organization but also contributes to the broader goal of promoting sustainability and environmental stewardship.

The areas for future research, scholars and practitioners can build on the foundational knowledge provided by this study, contributing to more effective strategies for fostering innovation and sustainability in organizations.

Author contributions: Conceptualization, M and BDS; methodology, M; software, AM and SF; validation, M, BDS and SF; formal analysis, BDS and AM; investigation, AM and SF; resources, AM and SF; data curation, BDS, AM and SF; writing—original draft preparation, M and BDS; writing—review and editing, M, BDS and SF; visualization, AM and SF; supervision, M and BDS; project administration, AM; funding acquisition, M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Research Grant Universitas Bina Bangsa, grant number 23/RG/R/I/2023, and the APC was funded by Research Grant Universitas Bina Bangsa.

Acknowledgments: Thank you to the Chancellor of Universitas Wahid Hasyim and Universitas Bina Bangsa for the invaluable encouragement provided towards this research, as well as the generous funding support.

Conflict of interest: The authors declare no conflict of interest.

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