Human Resources and Product Innovation Sustainability with Employee Creativity Mediating SME Sustainability

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Abstract

The investigation of human resources and environmentally responsible creativity via the lens of organizational factors is a highly effective, albeit constrained, method for predicting the complex interconnections necessary for the growth of sustainability in small and medium-sized organizations (SMEs). In an effort to overcome these limitations, the author of this article proposes three models, each of which contains variables operating on two levels: creativity development (operating at the individual level), sustainable product organizational innovation (operating at the organizational level), and sustainability development. The Structural Equation Model was utilized in order to provide feedback regarding the theoretical model. This demonstrates that one's knowledge, drive, and relationships with others can all function as predictors of creative output at the individual level. In addition to this, creativity is investigated in terms of its role as a mediator between the performance of sustainable product creation and human resources. With this approach, small and medium-sized enterprises (SMEs) have an easier time determining which human resource (HR) factors should be prioritized for Product Innovation Sustainability (PIP) performance. This is done with the intention of reducing the impact of the Covid-19 problem and creating a more sustainable world. An online questionnaire was given to a selection of Java-based small and medium-sized businesses (SMEs) in Indonesia, and their responses were used to compile the necessary data. The conclusions of this investigation provide credence to the most important discoveries, which were: (a) one's knowledge, (b) one's motivation, and (c) one's relationships all have a positive impact on creative output; (d) according to the three models, creative output fully mediates the relationship between human resources and the performance of Product Innovation Sustainability. This study makes a contribution to the existing body of research on human resources and the performance of Product Innovation Sustainability by adopting an approach that draws from multiple disciplines, conducting research at two levels, measuring the majority of the internal aspects of employees (want, emotion, idea, and feeling), and elaborating on the role of employee creativity as a mediator.

Keywords
creativity, human resources, small- and medium-sized enterprises, Product Innovation Sustainability.

1. Introduction

Human resources (HR) and Product Innovation Sustainability (PIS) are two strategic factors that any organization should foster in its quest for management excellence. Human resources and sustainable innovation should be the leading concepts for increasing business outcomes. Numerous scholars have stated that effective HR management increases innovation outcomes.

The research of human resource management should not be limited to a single orientation. If only one orientation is investigated, some businesses may appear efficient while others do not. For improved innovation outcomes, a comprehensive, impartial examination of dimensions and resources is necessary. This study begins by focusing on Product Innovation Sustainability, the most visible kind of innovation for customers. Product Innovation Sustainability is related with the acquisition and utilization of existing resources (stock generator) and learning, exploring, and innovative organizations (flow generator) (Brix 2017).

How do knowledge, motivation, and relationships give impact to the development of sustainable innovations in small and medium-sized enterprises? The purpose of this study is to clarify the direction of staff resources managed by businesses from one or more perspectives (Galende 2006, Yoon et al. 2015, Frederiksen and Knudsen 2017, Wernerfelt 1984). In order to produce sustainable breakthroughs, can creativity act as a contingency mechanism between information, relationships, and interactions?

2. Theory Development

The Resource-Based View (RBV) is the main theoretical approach of the study(Youndt and Snell 2004). Nonetheless, it will also make implicit references to other theories, such as the Knowledge-based View (KBV), which explains how knowledge has a direct impact on creativity. The current Ambidextrous Organizations Approach supports HR management based on the organization's direction. The connections between relationships, employee motivation, and Product Innovation Sustainability are also supported by other theories, including as Human Relations Theory and Cooperative Systems Theory (Muñoz-Pascual et al, 2019).

The innovation process is discussed from a dynamic angle in evolutionary theory based on different learning patterns that businesses may adopt by leveraging internal and external factors. Every SME is an ecosystem where predictable strategic initiatives can emerge. Evolutionary Theory employs universal processes (variation, selection, retention, and competition) to describe how organizations arise and evolve. The majority of initiatives are driven by the business's upper management, although initiatives are also driven by leaders throughout the organization (Kwon et al, 2014).

2.1. Human Resources

HR should be focused on enhancing firm performance by instilling a values-based culture in personnel. The three elements of human resources (intellectual, emotional, and social) interact to develop synergy. The constant improvement of personnel may thus inspire a significant increase in the creation of new ideas and Product Innovation Sustainability. Knowledge and its impact on Product Innovation Sustainability will be investigated within the intellectual domain, while motivation and its impact will be analyzed within the emotional component (Gerhart and Fang 2015, Corazza 2016).

Knowledge can be classified as either tacit or explicit. People's intellectual resources are trained to enable them to function successfully, appropriately, or appropriately. Intrinsic motivation encourages individuals to activate and concentrate their behavior. Relationships are formed between organization members and outsiders. Professional and contractual exchanges lead to formal or informal ones. Managers can gain new knowledge and ideas by managing these informal partnerships .

The study of human resource management has been founded on explicit knowledge, extrinsic motivation, and formal connections for decades. This second way of examining HR may make employee creativity and Product Innovation Sustainability more sustainable from a second standpoint. In addition, employees may regard rationalization as the sole way to steer HR as a rise in bureaucracy, hierarchies, or control. This may result in behavior that limits creative development and, eventually, Product Innovation Sustainability.

2.2. Creativity

Creativity can be described as the generation of useful new ideas for the development of new products or processes by businesses. Creativity is a developing organizational asset and a catalyst for technological, financial, intellectual,

and human progress. From the standpoint of RBV theory, competitive advantage is generated by the accumulation of strategic resources and competencies (Litchfield et al, 2015, Lepak et al, 2003).

2.3. Product Innovation Sustainability

HR and creative management can inPISre creativity and innovation, as according Alegre, Lapiedra, and Chiva. "Introducing a new or significantly enhanced good" is how the OECD defines product innovation. Product Innovation Sustainability, which includes a company's material and immaterial efforts to manage its resources (efficiency), is the topic of this study (effectiveness). Effective HR and inventive management may help PIS succeed, the writers know. Technological change is what some scholars call innovation, and they think it solves problems.

2.4. Research Hypotheses

To document a successful PIS, businesses will require highly innovative individuals with a history of learning and technology expertise. Employees must grow and learn from their personal experiences in order to integrate new information into the business. Managers must pay particular attention to knowledge, as they must ensure that their employees establish innovative learning processes. Creativity can be viewed as a dynamic personnel skill that the firm can actualize into a PIS that is sustainable.

Model 1. Performance of Knowledge-Creativity-Product Innovation Sustainability
H1= Knowledge influences creativity favorably.
H2= Creativity influences Product Innovation Sustainability.
H3= Creativity mediates the relationship between knowledge and Product Innovation Sustainability.

Motivation is the internal drive that directs the everyday actions of employees toward the attainment of goals. Motivation influenced by creativity may also result in intrinsic benefits unrelated to task performance. Authors such as Cohen-Meitar and de Buisonjé contend that an optimistic disposition and self-affirmation might increase creative ideas.

Model 2: Motivation-Creativity-Product Innovation Sustainability
H4= Inspiration favorably affects inventiveness.
H5= Creativity influences Product Innovation Sustainability.
H6= Creativity mediates the relationship between motivation and long-term PIS

Creativity in science and technology requires examining the relationships between individuals or small groups and their surroundings. These relationships can be driven and directed toward organizational objectives. Relationships enable employees to pool their ideas and produce more successful outcomes. Managers cannot disregard the fact that workers have emotional attachments to the organization.

Model 3: Relationships-Creativity-Product Innovation Sustainability
H7=Relationships impact innovation positively
H8= Creativity influences Product Innovation Sustainability.
H9=The effect of creativity as a mediator between connections and Product Innovation Sustainability

Creativity mediates the interaction between human resources and Product Innovation Sustainability. One may argue that businesses that effectively manage knowledge, incentive, and relationships foster innovation. This investigation examines three different models to determine the effect of each independent variable on sustainability (Figure 1).
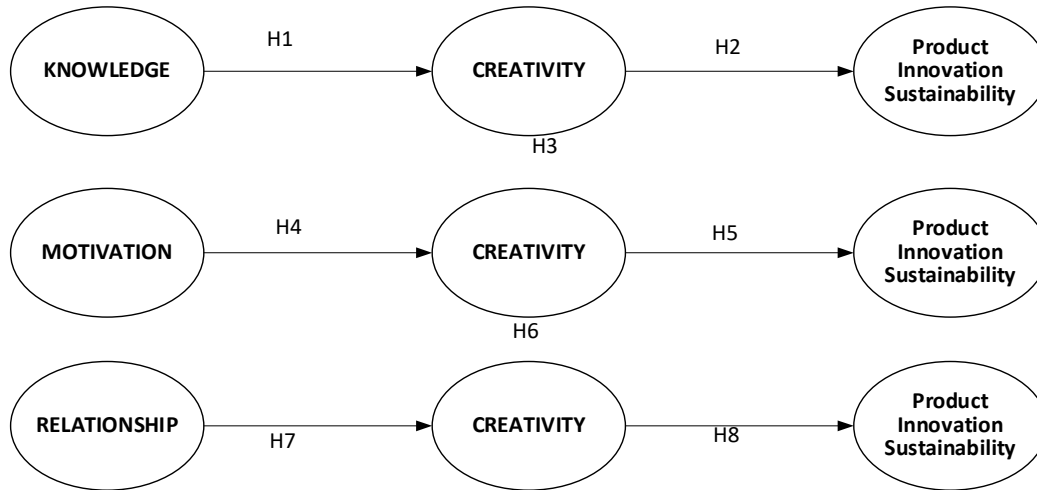
Figure 1. Research Framework

3. Methods
3. 1. Data and Sample
The information was gathered from a survey that was conducted online among 448 Indonesia SMEs which located in Regional Java. 267 people answered the survey.

This study employs a "time trend extrapolation test" to compare "late" vs. "early" respondents in order to look for any potential non-response bias. A one-way analysis of variance revealed no significant difference between the early and late responses for factors such firm size (headcount) and firm age (ANOVA).

3.2. Measures
The items of the components are measured using a Likert-type scale ranging from strongly disagree (1) to strongly agree (7). The overall framework of the three models consists of five constructs: knowledge, motivation, relationships, creativity, and product innovation sustainability.

Utilizing an eight-item scale with two orientations, knowledge is measured (four items for tacit knowledge and four items for explicit knowledge) [12]. The two orientations of motivation are assessed using a scale with fourteen items (De Saá-Pérez and Díaz-Díaz 2010) On a scale of ten items, relationships between its two orientations are measured, (Chow 2008).

Creativity is measured by a variety of verbal and figurative tasks designed to assess employees' creativity based on the dimensions or cognitive functions of fluency, flexibility, originality, and idea development. This is a useful instrument for measuring employee creativity in the management field, (Hayton 2005).

Lastly, product innovation sustainability is evaluated using a three-item scale (Hayton 2005). This paper begins by examining creativity as a prerequisite for product innovation sustainability. Moreover, product innovation sustainability is the most apparent kind of innovation to clients and will help businesses to receive higher benefits in a more direct manner (Wang and Ahmed 2004, Chen C-J and Huang 2009)

The paper also utilizes AMOS® to conduct a confirmatory factor analysis (CFA) to validity of measurement. The unidimensionality of each variable's items is confirmed (Kim 2006, Jensen et al, 2007, Od oardi et al, 2009, Alegre et al, 2006).

Table 2 Cronbach's alpha, variance explained, and factorial loads.

	Loading Factor
Knowledge (V.E = 64.39%)	
Explicit knowledge (Ex_Know) (α = 0.776)	
Ex_Know1 Employee training expenses are supported at my organization.	0.630
Ex_Know2. My company offers training to its staff.	0.640
Ex_Know3. Employees are given assistance in pursuing advanced degrees.	0.760
Ex_Know4. My company helps access databases and intranets.	0.830
Ex_Know5. My company supports product data.	0.620
Tacit knowledge (Tac_know) (α = 0.77)	
Ta_Know6. My company helps employees.	0.770
Ta_Know7. My company encourages employees.	0.790
Ta_Know8. My company promotes transdisciplinary training.	0.740
Ta_Know9. My company encourages practical courses.	0.770
Motivations (Mot) (V.E = 65.68%)	
ExtrinsicMotivation (Ext_Mot) (α = 0.855)	
Ext_Mot1. Good payment	0.670
Ext_Mot2. Equal payment	0.600
Ext_Mot3. Individual compensation	0.770
Ext_Mot4. Group compensation	0.820
Ext_Mot5. Business compensation	0.800
Ext_Mot_6. Job flexibility	0.630
Ext_Mot_7. Conciliation	0.680
Ext_Mot_8. Promotions	0.730
IntrinsiMotivation (Intr_Mot) (α = 0.940)	
Intr_Mot_9.Employees satisfaction	0.800
Intr_Mot_10. Employees engagement	0.900
Intr_Mot_11. Employees responsibility	0.850
Intr_Mot_12. Employees identification	0.900
Intr_Mot_13. Employees problems consideration	0.710
Intr_Mot_14. Employees have trust	0.890
Intr_Mot_15. Employees implication	0.880
Intr_Mot_16. Employees self-realization	0.760
Relationships (Rel) (V.E = 62.34%) (α = 0.880)	
Rel_1. Databases and software are both available.	0.660
Rel_2. There are corporate gatherings.	0.660
Rel_3 Customers can provide information.	0.690
Rel_4. Suppliers can provide information.	0.860
Rel_5. An informational source is the allies.	0.740
Rel_6. A teamwork	0.670
Rel_7. Customer service work.	0.720
Rel_8. Working with suppliers is involved	0.820
Rel_9. Work is done with allies.	0.630
Informal_Relationships (In_Rel) (α = 0.900)	
In_Rel_10 . Relaxed meetings	0.770
In_Rel_11. Discussions	0.820
In_Rel_12. Coincidences	0.820
In_Rel_13. Common offices	0.690
In_Rel_14. Consensus	0.760
In_Rel_15. Cooperation	0.820
Creativity (Crea) (V.E = 75.19%); (α = 0.940)	
Cre_1. People are rewarded for their initiative and curiosity.	0.900
Cre_2. When introducing fresh ideas, people are encouraged and supported.	0.910

Cre_3. There are several options.	0.870
Cre_4. Rarely are there any solutions.	0.880
Cre_5. There is consideration, production, and care	0.790
Cre_6. Spontaneity and improvisation exist.	0.850
Cre_7. There is vitality and vigor.	0.830
Product Innovation Sustainability (PIS) (V.E = 74.69%); (α = 0.689)	
Pis_1. Innovations in sustainable product numbers	0.780
Pis_2. A new sustainable product's sales	0.820
Pis_3. Comparison of portfolio products and new sustainable products	0.740

Note. V.E = Variance explained; α = Cronbach's alpha.

SEM is used in the study to evaluate how well the three models match the data (H1–H9). In the literature, the use of SEM frequently calls for a minimum sample size of 1. 245 companies make up the basis of this research, significantly more than was necessary.

The parameters recommended by Hair et al. (2019) and Byrne (2013) for both an excellent structural model fit and a robust measurement model fit are included in the absolute (2/df, RMSEA) and incremental (CFI, TLI) indices shown in Table 3.

Table 3. Measurement model fit and structural model fit.

Measurement Models Fit	X2	Df	p-Value	X2/df	CFI	TLI	RMESA
Know—Crea--PIS	38.426	17	0.000	2.260	0.970	0.937	0.072
Mot—Crea--PIS	246.134	89	0.000	2.766	0.950	0.932	0.070
REL-CRE-PIS	213.589	79	0.000	2.704	0.948	0.931	0.070
Structural Models Fit	X2	Df	p-Value	X2/df	CFI	TLI	RMESA
Know—Crea--PIS	543.753	146	0.000	3.676	0.896	0.864	0.072
Mot—Crea--PIS	1089.284	297	0.000	3.682	0.876	0.874	0.072
REL-CRE-PIS	1032.355	273	0.000	3.796	0.874	0.884	0.078

Note.Know = Knowledge; Mot = Motivation; Rel = Relationships; Cre = Creativity; PIS = Product Innovation Sustainability

4.2. Measurement Model Fit

The study employs CFA to analyze the psychometric characteristics of variables in accordance with Hair et al [25] recommendations. Multiple variables pass the first- and second-order confirmatory tests, indicating an acceptable match (see Table 2).

The initial measurement model fit (Knowledge-Creativity-Product Innovation Sustainability) yields a 2 of 38.426 (degrees of freedom = 17, p = 0.000) and a 2/df of 2.266, which is below 3.0. According to Joreskog [27], this value should be between 0 and 3 for the model to be a good fit.

The Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) are both 0.938. These indices are more than 0.9, indicating a satisfactory fit. The following statistic is the Root Mean Square Error of Approximation (RMSEA). This value is 0.072, which is less than 0.08, indicating a satisfactory fit.

In the first measurement model fit (Motivation-Creativity-Product Innovation Sustainability), 2 equals 246,134 (df = 89, p = 0.000) and 2/df is 2,766. CFI equals 0.950, TLI equal 0.932, and RMSEA equals 0.070. This model provides an excellent fit compared to the two prior models.

4.3. Structural Model Fit

Table 4 displays the results of the structural model fit used to evaluate the hypotheses (H1–H9).

Table 4. Research hypotheses and results.

Know—Crea--PIS	**Causal Relations**	**Est.**	**SE**	**CR**	**p-Value**	**Results**
H1	Know → Crea	1.764	0.456	0.378	***	Supported

H2	Crea→ PIS	0.534	0.086	0.267	***	Supported
H3	Know→Crea→PIS	-	-	-	-	Supported
Total Mediation	TE=DE+IE=0.000+(0.846 x 0.525)= 0.444					
Mot—Crea--PIS	**Causal Relations**	**Est.**	**SE**	**CR**	**p-Value**	**Results**
H4	Mot → Crea	0.378	0.049	7.730	***	Supported
H5	Crea→ PIS	0.522	0.094	5.565	***	Supported
H6	Mot→Crea→PIS	-	-	-	-	Supported
Total Mediation	TE= 0.000+(0.494 x 0.476) = 0.235					
Rel—Crea--PIS	**Causal Relations**	**Est.**	**SE**	**CR**	**p-Value**	**Results**
H7	Rel → Crea	0.146	0.043	3.333	***	Supported
H8	Crea→ PIS	0.525	0.092	5.813	***	Supported
H9	Rel→Crea→PIS	-	-	-	-	Supported
Total Mediation	TE= 0.000+(0.846 x 0.499)= 0.422					

Accordingly, H1 is corroborated by the results of the first structural model fit. This hypothesis is supported by the two following models: (H5 and H8). With = 0.533 (p 0.001), the first structural model fit reveals a substantial relationship between creativity and Product Innovation Sustainability.

The findings show that creativity introduces total mediation between knowledge and sustainable product innovation, with creativity channeling the total impact of information on sustainable product innovation. According to the findings, adding creativity has a net benefit on product innovation sustainability that is equal to the indirect effect (0.8445 0.525) and cancels out the knowledge's initial direct effect (0.000).

The results of the second proposed structural model fit therefore support hypothesis 4. Similar to the previous model, the results confirm a positive and statistically significant relationship between creativity and persistent PIS with = 0.520 (p 0.001). According to Hypothesis 6, creativity is a mediator variable between motivation and Product Innovation Sustainability. When creativity is placed between motivation and Product Innovation Sustainability, the entire impact of motivation on Product Innovation Sustainability is mediated by creativity. The total effect (0.237) of introducing creativity is similar to the indirect effect (0.499 0.475), nullifying the original direct effect (0.000) of motivation on Product Innovation Sustainability.

Based on the results of this third structural model fit, the hypothesis H7 is validated. H8 analyzes the relationship between creativity and Product Innovation Sustainability within this methodology.
As with the two preceding models, the results demonstrate a positive and statistically significant connection between creativity and persistent PIS with = 0.524. (p 0.001).

Lastly, H9 examines the role of creativity as a mediator between relationships and prolonged PIS. When creativity is introduced, the total effect (0.398) equals the indirect effect (0.806 0.499), nullifying the direct effect (0.000) that partnerships had on sustained PIS.

In confirming H2, H5, and H8 in the three models (knowledge, motivation, and relationships), the research findings give pertinent information by demonstrating that creativity favorably affects Product Innovation Sustainability; that is, H2, H5, and H8 were confirmed. Consequently, the results confirm that when managers appropriately orient HR (knowledge, motivation, and connections), they will increase the generation of new ideas (creativity) and, eventually, sustained PIS. This research emphasizes the significance of innovation for establishing Product Innovation Sustainability and, by extension, a sustained competitive edge. Creativity is a variable that channels the influence of HR on Product Innovation Sustainability, allowing managers to encourage their staff to generate more ideas.

In the first structural model fit (Knowledge-Creativity-Product Innovation Sustainability), 2 is 543.761 (degrees of freedom = 147, p = 0.000) and 2/df is 3.674, which is not significantly greater than 3.0 [98]. CFI is 0.896, while TLI is 0.864. In the second structural model fit (Motivation-Creativity-Product Innovation Sustainability), 2 is 1089.272 (degrees of freedom = 294, p = 0.000) and 2/df is 3.46, which is close to 3.00 (Jöreskog 2014).

In the final structural model fit examined here (Relationships-Creativity- Product Innovation Sustainability), 2 = 1033.350 (df = 272, p = 0.000) and 2/df = 3.785% (Jöreskog 2014). The final results of the three structural models indicate a good fit at the joints.

5. Discussion and Conclusions

This research demonstrates two significant conclusions: (a) To create a sustainable PIS, managers must manage and nurture innovation in their employees, regardless of their HR management approach (knowledge, motivation, or relationship). (b) This conclusion shows the models' consistency and stability by accurately finding a positive correlation between creativity and Product Innovation Sustainability in each of the three models investigated individually. The results indicate that regardless of the HR model used, creativity is always an antecedent variable of sustained PIS. The study demonstrates that it is essential that each model produces the critical success characteristics for the growth of creativity and, as a result, sustained PIS.

Integrated management systems (intranet) let firms store important data and reduce inefficient management practices like paper use and storage. The findings suggest that inner and extrinsic motivation factors influence creativity and persistent innovation. The results show that formal and informal interactions explain creativity and sustained innovation. Meetings, teamwork, and shared spaces or workplaces have a big impact on fresh idea generation and sustained creativity. Three structural equation models show how knowledge, motivation, and relationships can be used to create corporate talent for Product Innovation Sustainability (Maes and Sels 2013).

6. Limitations and Future Research

This could also lead to significant discoveries identifying the types of information, motivation, and relationships that have the greatest impact on creativity and, thus, on Product Innovation Sustainability. Future study should also address the possibility of unifying these three models in order to examine the impact of the HR dimensions in a single, comprehensive model. The work employs an advanced quantitative method, SEM, to evaluate the hypotheses, thus catering to the investigation of causal links with greater complexity.

7. Practical Implications

This study underlines the importance of effective HR (knowledge, motivation, and relationships) to achieve the best degree of creative performance and generate more original and helpful ideas for any organization to develop or introduce. Hard assignments that require people to use their abilities and skills can create inner drive (which is important for creativity).

To enhance creativity, a company needs a diverse workforce with various personalities. Managers must continuously invest in tacit knowledge (Field and Chan , 2018, Stankevičiūt and Savanevičienė, 2018), intrinsic motivation (Palm and Rosengren, 2020, Kalliath and Chan 2017),
and informal connections (Zheng and Xie , 2017) without neglecting explicit knowledge.

Innovation necessitates a "group" strategy that includes stakeholders (such as employees, customers, suppliers, and governments). On the one hand, interested stakeholders assist in defining criteria and developing new innovation initiatives. Companies are utilizing their highest levels of innovation and human resources to adapt and develop new materials and medical equipment at record speeds in order to combine their lawful commercial interests with the huge societal aims that this field of work necessitates via the "invisible hand."

Most companies concentrate on a single development objective at a time, and research has not yet addressed how to better incorporate sustainability and human resources into the innovation dynamic (Muñoz-Pascua 2019, Fernandes et al, 2021).

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