

Gauging the nexus between innovation and firm performance, the mediation role of knowledge sharing

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Abstract: *The hospitality industry of Ghana has seen massive improvements in the past decade. However, literature on the nexus between innovation and the performance of this industry remain scanty. Therefore, this study examines the relationship between innovation (technological and non-technological innovation) and the performance of star-rated hotels in Ghana. The study employs the structural equation modelling (SEM) technique to estimate the relationship between the variables. Using the survey response of 636 hotel managers from the star-rated hotels in Ghana, the SmartPLS result reveals that, both technological and non-technological innovation influences knowledge sharing within the star-rated hotels. Again, technological and non-technological innovation influences the performance of these hotels. Further, the knowledge sharing activities influence the performance of the hotels. Finally, knowledge sharing in these hotels mediate the positive relationship between innovation and firm performance. This reaffirms the significance of knowledge sharing. Therefore, management of these star-rated hotels should prioritize organizational climate and culture that supports the deliberate creation and sharing of knowledge.*

Key Words: Innovation, firm performance, knowledge sharing, Hotels, Ghana.

1. INTRODUCTION:

The relationship between innovation of all kinds and the performance of firms has received much academic inquisition lately because of the significance to organizational success (Tian et al., 2021; Hung & Chou, 2013). Although, the survival of the modern business is characterized by several factors (Hartono & Sheng, 2016; Feng, et al., 2015). Innovation has become a viable cost-effective avenue for business of all sizes to maximize resources, profit, and sustain continuous growth. Innovation is the creation of new products, services, methods processes to enhance the output of an organization. While product and service innovations are technologically related, the later are non-technologically related (Ramadani et al., 2019; Tuan et al., 2016).

Extant literature establishes positive significant nexus between innovation and firm performance (Wang, 2019; Vaccaro et al., 2010). Further, specific studies also identify positive connections between technological and non-technological innovation and firm performance (Xu et al., 2019; Lin (2014). This emphasizes the potency of innovation to transform the fortunes of businesses irrespective of the size and location. Despite these established relationships, some organizational factors like structure, communication, culture, and resources are likely to deter or promote technological and non-technological innovation within firms (Ramadani et al., 2019). Therefore, these draws curiosity about the role of organizational knowledge sharing in the relationship between technological and non-technological innovation and firm performance.

Organizational knowledge sharing involves the creation and dissemination of knowledge within an organization amongst employees (Xu, et al., 2019; Wang et al., 2016). This knowledge could be in the form of explicit (written form of knowledge), implicit (incidental knowledge directly implied) and tacit (incidental and not directly implied). These are influenced by organizational culture and climate (Rodríguez, 2019). Therefore, organizations with a climate or culture which promotes knowledge sharing are likely to improve innovation capability (Hartono & Sheng, 2016; Wang et al., 2016). Further, literature emphasizes the role of knowledge sharing in employee learning, organizational learning, and organizational performance (Xu, et al., 2019). Consequently, this creates research curiosity on the role of knowledge sharing in the relationship between innovation and organizational performance.

Organizational performance could be characterized by financial and non-financial success (Tian et al., 2021; Ramadani, et al., 2019). Nonetheless, these performances are linked to several organizational factors like human resource, capital, organizational culture, structure, as well as innovation capability (Lin, 2013). Again, literature also establishes a positive relationship between technological and non-technological innovation and firm performance (Park et al., 2006; Tuan et al., 2016). However, in Ghana, literature on the mediating role of knowledge sharing in this relationship is scanty (Frempong et al., 2020; Tian et al 2021; Danso et al., 2020). This creates a research gap which requires empirical inquisition to avoid policy imbalance. Consequently, this study explores the relationship between innovation and organizational performance with and without organizational knowledge sharing in the hospitality industry of Ghana. Unlike existing literature, this is unique because it focuses on the role of knowledge sharing activities in the relationship between these two variables. Accordingly, we seek answers to the research questions; what is the relationship between innovation and firm performance? And what is the mediating role of knowledge sharing in the relationship between innovation and firm performance? Following, the study employs the structural equation model with data from 636 star-rated hotels. The results show that innovation influences knowledge sharing within the hotels, innovation influences the performance of these hotels, knowledge sharing influences the performance, and knowledge sharing in these hotels mediates the positive relationship between innovation and firm performance. Therefore, the study result is significant to policymakers, industry practitioners, and scholars because it unearths the significance of knowledge sharing within organization. This challenges management of these hotels to improve human resource policies to create an environment which promotes knowledge sharing.

The remainder of the paper is organized as follows; literature review and hypothesis development, research methods, empirical analysis, discussion, and conclusion.

2. LITERATURE AND LITERATURE REVIEW:

This section presents literature on the innovation (technological and non-technological innovation) activities of firms, organizational performance, and knowledge sharing. Further, based on the reviewed literature, the research hypotheses are developed.

2.1 Innovation

The growth, expansion, and sustainability of the modern business depends on the ability to innovate technologically or non-technologically (Tian et al., 2021). This is why this subject has attracted globally research inquisition. While innovation differ with respect to the rate of diffusion, Wang (2019) confirms that radical innovations have higher probability of increasing the performance of firms than incremental innovations. According to Hung, et al (2013), firms acquiring external technology have a higher likelihood of increasing firm performance compared to the firms relying solely on internal technology. This suggests that inbound open innovation is significant for improving organizational performance. However, Park et al (2006) reveal that organizations with higher research and development intensity are likely to increase firm performance compared to those without. According to Atalay et al (2013), technological innovation positively influences firm performance. However, non-technological innovation had no significant effect on the performance of the firm. These results could be explained by the fact that the study focused on the automotive industry. Li et al (2006) in their study suggests that planned employee training, motivation and process

control within a firm positively influence technological innovation in a firm. Further, the study establishes a significant positive relationship between technological innovation and firm performance. In confirmation, Xu et al (2019) using the partial least square structural equation model found that technological innovation influences firm's performance. This depicts the significant role of human resource and organizational factors in technological innovation. In another study, Lin (2014) uncovers that technological innovation (service innovation) influences firm performance. Specifically, these innovations focus on reducing cost, improving the quality, and reliability. This result is consistent with the outcome of Atalay et al (2013) to confirm that the nature of firm could affect the role of technological or non-technological innovation on firm performance. Again, while controlling for firm size, capital, and labor cost, Ramadani et al (2019) affirms that technological innovation (product innovation) influences positively the performance of firms. Further, the study reveals negative relationship between firm age, competition and firm performance. However, these results are related to economies in transition and could differ when applied to different economies. On the other hand, Tuan, et al (2016) reveals a significant positive relationship between non-technological innovation and firm performance. This contradicts the findings of Atalay et al (2013). Therefore, equal attention should be given to non-technological innovation to improve overall firm performance. However, Younas and Rehman (2020) find no positive associations between non-technological innovation and the performance of firms.

2.2 Firm performance

Firm performance covers both financial and non-financial aspects extensively (Tian et al., 2021). The survival and sustainability of all businesses irrespective of size, location, and nature of service depends on sustainable firm performance (Ramadani, et al., 2019). According to Yu et al. (2017) the financial performance of firms include improvement in the cost of production, the collection, and processing of information. This suggests that the ability of firms to create, store, and disseminate knowledge between employees has the probability to increase firm performance. On the other hand, non-financial performance of firms includes improvement in relationships with partners and customers. Therefore, strategic decision such as innovation investments and knowledge sharing could largely improve the performance of firms (Seebacher & Winkler, 2015). Accordingly, we expect the innovation investments and knowledge sharing within the star-rated hotels of Ghana to promote both financial and non-financial performance. This is because, non-technological innovations like supply chain management creates short and long-run economic advantages (Huo *et al.*, 2014), because it improves production and reduces waste. There are four main categories of firm performance measurement; Profitability, market, customer, and innovation (O'Cass & Sok, 2013, Ramadani, et al., 2019). Profitability of firms is measured by the firm ability to maintain healthy working capital, achieve higher return on investment, and improve owners' value (Singh et al. 2017; Huang & Hou, 2019). The investment in improved machinery and equipment has the probability of increasing production and cutting lead-time. Again, employing improved processes and procedures reduces production cost and increases profitability. Market performance includes the ability of the firm to create new markets, compete successfully in existing market, and increase market share (Liang & Gao, 2020; Feng et al. (2015). Introducing new products and services timely has the potential to maintain existing customers and also attract new customers through the creation of an entirely new market. Customer performance includes the ability of the firm to maintain existing customers, attract new customers, and satisfy the needs of both existing and new customers (Ukko & Pekkola, 2015; Striteska & Jelinkova, 2015). Customer satisfaction is key to the performance of firms, therefore, constantly innovating to meet the needs of customers improves sales and profitability. Finally, innovation performance is the ability of the firm to achieve expected results from their innovation strategies (Vukšić et al., 2015; Greco et al., 2015). Innovation requires the commitment of firm resources, therefore, failed innovation has the potential to drive the firm into distress. On the other hand, a successful innovation would increase the value of the firm.

2.3 Knowledge sharing

According to Wang and Wang (2012) explicit knowledge and tacit knowledge sharing activities within a firm influences the innovation capability of firms and the overall firm performance. However, explicit knowledge has a higher propensity than tacit knowledge. This is because explicit knowledge is documented while tacit knowledge is

acquired incidentally through work. Further, Vaccaro et al (2010) reveal that knowledge management and sharing within firms improves firm performance. Firms promoting knowledge sharing improves employees skills and work efficiency. Wang et al. (2014) asserts that tacit knowledge influences human, structural and relational capital development within firms. Further, these contributes to operational and financial performance of firms. However, explicit knowledge influences financial performance the greatest. Wang et al (2016) found that innovation positively mediates the relationship between knowledge sharing and firm performance. This is because the constant introduction of new services, methods, or processes spur knowledge creation and sharing within firms. Hartono and Sheng (2016) suggests that knowledge sharing positively affects product development, operational capability, and firm performance. This provides evidence to the role of knowledge sharing in technological and non-technological innovation. Yao et al. (2020) reveal that organizational culture, management support, knowledge sharing culture have positive significant influence on tacit knowledge sharing within an organization. Unlike explicit knowledge which is documented, tacit knowledge flourishes in an environment which promotes communication between employees. Further, the study reveals that both tacit and explicit knowledge have positive effect on technological innovation. This is because organization cannot document everything and thus tacit knowledge creates a rich source of knowledge for organizational progress. Again, López-Cabarcos et al. (2019) found a positive association between tacit knowledge and firm performance, tacit knowledge and product innovation, and product innovation and firm performance.

2.4 Hypothesis development

The following hypotheses are developed to help gather insights into the study objective and research questions. The formulation of the hypotheses is rooted in the literature presented as well as the aim of the study. See figure 1 for the conceptual framework.

Knowledge sharing promotes the creation and sharing of new ideas, methods, and processes (Hartono & Sheng, 2016; Wang, et al., 2016). Consequently, these creates a connection between innovation and the working environment. Technological and non-technological innovation encourages communication within the organization as workers share experiences and ideas on how to use new methods, products, and processes (Xu et al., 2019). Therefore, we hypothesize that innovation influences positively knowledge sharing with the hospitality industry of Ghana.

H1a: Innovation positively influences knowledge sharing of star-rated hotel of Ghana

Since innovation is linked to the creation of products/services, methods and processes, there is the likelihood that innovation would positively affect firm performance. Consequently, literature (Tian et al., 2021; Ramadani et al., 2019) establishes a positive association between innovation and firm performance. Based on this assertion, we postulate that innovation positively influences firm performance in the hospitality industry of Ghana.

H1b: Innovation positively influences firm performance of star rated hotel of Ghana

Knowledge sharing motivates learning and shortens the learning curve for employees. This reduces waste and improves efficiency. Therefore, firms with positive knowledge sharing environment are noted to have higher firm performance compared to those without (Wang, et al., 2016; Wang & Wang, 2012). Therefore, we hypothesize that knowledge sharing within firms positively influences firm performance in the hospitality industry of Ghana.

H2a: Knowledge sharing positively influences firm performance of star rated hotel of Ghana

Given that knowledge sharing has a positive link with innovation and also with firm performance (Wang, et al., 2016; Wang & Wang, 2012). We postulate that the relationship between innovation and firm performance in the hospitality industry of Ghana is mediated by knowledge sharing. Thus we expect knowledge sharing to explain the relationship between these variables.

H2b: Knowledge sharing mediates the relationship between innovation and firm performance of star rated hotel of Ghana

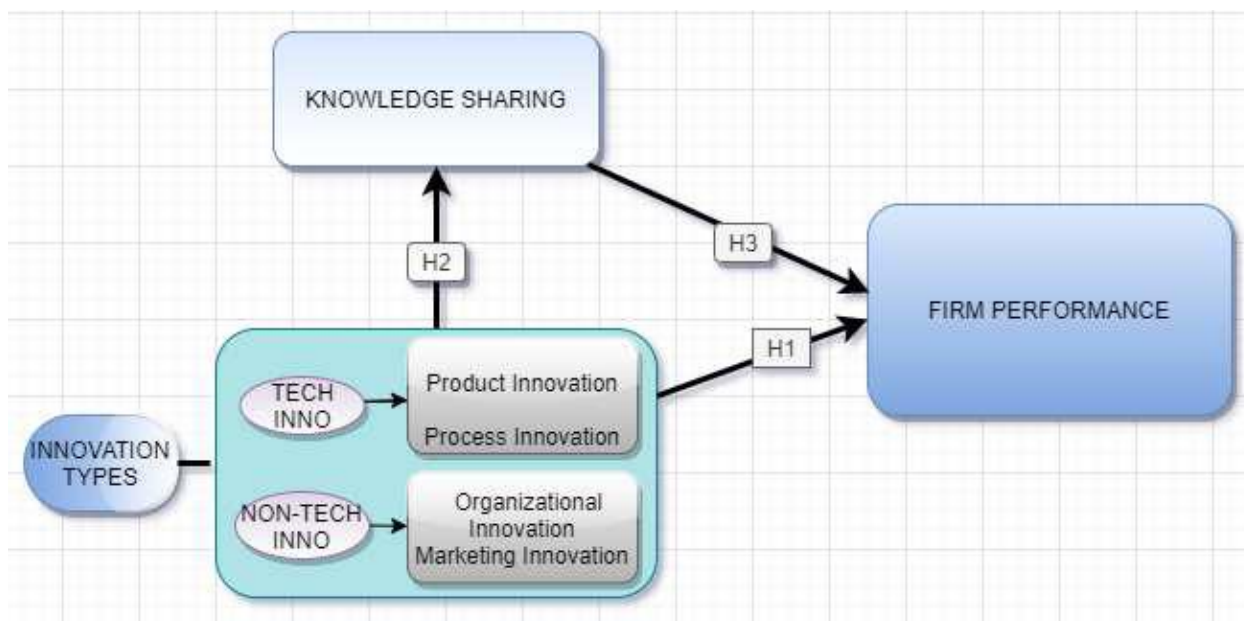


Figure 1: Conceptual Frame work

3. METHODOLOGY:

3.1 Data source and sampling technique

The study follows a quantitative approach to examine the nexuses between the variables (innovation, knowledge sharing, and firm performance) in the hospitality industry of Ghana. The hospitality industry of Ghana is vast encompassing several sub-divisions. Therefore, we are unable to cover the entire sector. Consequently, we first adopt the purposive sampling technique to select only star rated hotels in the country. The inclusion of only star hotels in the study streamlines the study because star rated hotels have met specific industry standards to be awarded such class. Further, we employ the census technique to include all 680 star rated hotels across the country (5 star-1 star) (GTA Report, 2019). The target respondents within the hotels are the hotel managers of each hotel. This group of individuals have much knowledge about the subject under consideration because they are decision makers and are involved in the strategic planning of the hotels. After identifying the target population and the sample for the study, we designed a four-part survey questionnaire to solicit the response of the hotel managers. The first focused on the technological and non-technological innovation efforts of the hotels, the second focused on the performance of the hotels, and the third focused on the organizational knowledge sharing activities in the hotels. To provide clarity in the survey instrument, two separate processes were employed; first, the split-half method was used to survey 20 managers. After, the response from the managers were analyzed for possible errors and misleading words. Second, the survey instrument was reworded to improve clarity. Given the COVID-19 protocols, two methods were employed to solicit the response of the managers across the country; first, the questionnaires were hand delivered to hotels in Accra and Kumasi. Second, email was used to administer the questionnaire to hotels in other parts of the region. Although, all the 680 star rated hotels in the country as at 2019 were considered for the study, the limitations of the online survey like non-delivery and no response from the managers yielded a response rate of 93.5%. The collated responses were cleaned, coded, and analyzed using the SmartPLS software. Per the total responses generated, the generalization of the study outcome is not affected. The survey process lasted between March and June 2021.

3.2 Measurements of Constructs

Given that the study examines a phenomenon which has the backing of several literature, the survey instrument was designed with constructs adopted from existing studies. Table 1 summaries the three (3) constructs, the elements

within each construct, the number of items, the measurement scale, and the source adopted from. First, the survey measures the relationship between the innovation (INNO) construct and the firm performance (FPERF). Further, the relationship between these variables is mediated with knowledge sharing (KNOWSHARIN). The innovation construct has two elements; technological and non-technological innovation. Accordingly, the content of these elements (product innovation, process innovation, marketing innovation, and organizational innovation) are adapted from (Danneels and Kleinschmidt, 2001, Hertog and Bilderbeek, 1998, Hu, et al., 2020, Mu, et al., 2019, Wu, et al., 2008), respectively. The above-mentioned dimensions of innovation with respect to their measurement items were all assessed on a five-point Likert scales ranging from strongly disagree to strongly agree. Firm performance as the main dependent variable in our study model. Firm performance has four elements; profitability, customer, market, and innovation. Accordingly, the content of these elements (innovative performance, market performance, customer service performance and financial performance, with an adoption from (Hertog and Bilderbeek, 1998, O’Cass and Sok, 2013, Ramadani, et al., 2019), respectively. Respondents were asked to rate the performance of hospitality firms, specifically hotels, by indicating their strength for performance also based on a five-point Likert-scale. Further, knowledge sharing activities in the hotels had three elements; explicit, implicit, and tacit knowledge. Accordingly, the content of these elements are adopted from (Afriyie, et al., 2020, Khari and Sinha, 2018, Littlejohn and Foss, 2010, Matschke, et al., 2014, Michailova and Minbaeva, 2012, Nguyen, et al., 2019, Nielsen and Razmerita, 2014, Šajeva, 2007). A composite measure for knowledge sharing was developed comprising ten (10) item. A 5-point interval scale which range from least practiced =1 to highly practiced =5 was used to ascertain from the respondents their hotel firms’ knowledge sharing innovation types with regards to the firm performance relative to competitors.

Table 1. Measurement Constructs

Constructs	Elements	Items	Scale	Sources
Innovation Types	Technological	10	Ordinal	Danneels & Kleinschmidt, 2001, Hertog and Bilderbeek, 1998, Hu, et al., 2020, Mu, et al., 2019, Wu, et al., 2008)
	Non-technological	9	Ordinal	
Firm Performance	Profitability	5	Ordinal	(Hertog and Bilderbeek, 1998, O’Cass & Sok, 2013, Ramadani, et al., 2019
	Market	5	Ordinal	
	Customers	5	Ordinal	
	Innovative	5	Ordinal	
Knowledge sharing	Explicit	4	Ordinal	(Afriyie, et al., 2020, Khari & Sinha, 2018, Littlejohn & Foss, 2010, Matschke, et al., 2014, Michailova & Minbaeva, 2012, Nguyen, et al., 2019, Nielsen & Razmerita, 2014)
	Implicit	4	Ordinal	
	Tacit	2	Ordinal	

Source: Authors Construct

Note: See full details in the appendix

3.3 Model specification

Given the research problem, objective, and questions, the outcome of these can best be estimated with a series of regression models. Therefore, we employ the structural equation model (SEM) similar to existing studies (Tian et al., 2021) to estimate the relationship between innovation (INNO), organizational performance (FPERF), and knowledge sharing (KNSHARIN). The SEM supports the estimation of complex associations between one or more independent variables as well as one or more dependent variables. This statistical method allows the estimation of multilevel regression models and is applied to testing research hypotheses that contain direct and indirect observations of one or more dependent and independent variables respectively. The central motivation for adopting the SEM technique in this study is to examine the relationship between the variables and also authenticate the proposed casual models. In line with the research objectives, the model contains three (3) variables; INNO, FPERF, and KNSHARIN, where INNO represents technological and non-technological innovation in the stat rated hotels, FPERF represents the performance of the hotels, and KNSHARIN represents the knowledge sharing activities of the hotels. Accordingly, INNO is the response variables (Y) while FPERF is exogenous variable with KNSHARIN as the mediating variable. The model can therefore be presented theoretically in a matrix form as:

$$\begin{bmatrix} y_1 \\ \dots \\ y_p \end{bmatrix} = \begin{pmatrix} 0 & \dots & \beta_{1p} \\ \vdots & \ddots & \vdots \\ \beta_{p1} & \dots & 0 \end{pmatrix} \begin{bmatrix} y_1 \\ \dots \\ y_p \end{bmatrix} + \begin{pmatrix} \delta_{11} & \dots & \delta_{1q} \\ \vdots & \ddots & \vdots \\ \delta_{p1} & \dots & \delta_{pq} \end{pmatrix} \begin{bmatrix} x_1 \\ \dots \\ x_q \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \dots \\ \varepsilon_p \end{bmatrix} \tag{1}$$

Summarily the matrix equation in Eq. (1) can be reformulated as:

$$Y = BY + \Gamma X + \varepsilon \tag{2}$$

Where p represents the number of regression equations to be estimated simultaneously, p by p \mathbf{B} square matrix contains the parameter coefficients of the regressors of Y variables on the other Y variables with the 0 diagonal values implying that a variable cannot cause itself. Also, the p by q $\mathbf{\Gamma}$ matrix contains coefficients of the Y 's on X 's whereas ε is a p by 1 vector consisting of residual terms. Based on the theoretical model specification, a deduction can be made that series of regression equations (3) are to be estimated to assess the causal effects amid the variables as shown in equations 3a-3d.

$$INNO_i = \beta_0 + \beta_a KNSHAR + \varepsilon_i \tag{3a}$$

$$INNO_i = \beta_0 + \beta_b PERF + \varepsilon_i \tag{3b}$$

$$KNSHAR_i = \beta_0 + \beta_b PERF + \varepsilon_i \tag{3c}$$

$$INNO_i = \beta_0 + \beta_a KNSHAR^* + \beta_b PERF + \varepsilon_i \tag{3d}$$

4. RESULTS AND ANALYSIS OF FINDINGS:

4.1 Empirical Estimation

To estimate the proposed structural equation model to explore the relationship between the variables specified, we perform reliability and validity tests on the research constructs. Specifically, we employ the Cronbach's alpha, composite reliability, KMO and Bartlett's and, Herman single factor tests. Table 2 displays the results from the tests. We estimate the internal consistency of the research constructs with Cronbach's alpha. Accordingly, the value reported for Cronbach's alpha are all above 0.9 and establishes the consistency of the research construct. Further, we test for the sampling adequacy using the KMO and Bartlett's test. The result of more than 0.8 and probabilities of 0.00 reveals the adequacy of the study sample.

After ascertaining the reliability of the research constructs, we progress to test the validity of the research constructs using the cross-loading factor and the average variance extracted (AVE). Table 2 shows the results of the validity test. The predictable values of the cross-loading factor must be above 0.7. Therefore, the results show all the constructs have cross-loading values above 0.7. This proves the items adequately support the various constructs within the study. Further, the outcome of the AVE is expected to show values above 0.5. Therefore, the stated constructs all show values above 0.5 to prove the research instrument meets both reliability and validity requirements to warrant further investigation.

Table 2. Construct Reliability and Validity

Factors	Factor Loads	Eigen-value	Cum.% variance explained	Cronbach α	AVE	KMO-test	B-S test
Factor 1: Innovation							
MKTINNO	0.940			0.945	0.859	0.858	2603.736***
ORGINNO	0.949	3.437	85.924				
PROCINNO	0.951						
PRODINNO	0.865						
Factor 2: Performance							
CSPERF	0.948	3.566	89.138	0.959	0.891	0.863	2914.113***
INNOPERF	0.935						

MKTPERF	0.945						
PROFIT	0.947						
Factor 3: Knowledge Sharing							
KNOWSHARIN1	0.811	6.536	65.357	0.941	0.654	0.968	4278.491***
KNOWSHARIN2	0.803						
KNOWSHARIN3	0.822						
KNOWSHARIN4	0.796						
KNOWSHARIN5	0.807						
KNOWSHARIN6	0.809						
KNOWSHARIN7	0.815						
KNOWSHARIN8	0.819						
KNOWSHARIN9	0.791						
KNOWSHARIN10	0.809						

***Note:** MKTINNO (Marketing innovation); ORGINNO (Organizational innovation); PROCINNO (Process innovation); PRODINNO (Product innovation); CSPERF (Customer Service Performance); INNOPERF (Innovation Performance); MKTPERF (Market Performance); PROFIT (Profitability); KNOWSHARIN (Knowledge Sharing). KMO represents Keiser Mayer Oklin whereas B-S stands for Bartlett’s Sphericity. *** represents 1% level of significance.

Statistically, the various constructs employed in the study should be distinguishable from each other. Therefore, to examine this phenomenon, we use the Fornell-larcker criterion and the Heterotrait-Monotrait Ratio (HTMT) to explore the presence or absence of this issue. According to Henseler et al. (2015) the acceptable value for the Fornell-Larcker criterion should have a threshold of 0.85. Therefore, per the result shown in table 3 (KNOWSHARIN and INNO=0.710, FPERF and INNO=0.856, and FPERF and KNOWSHARIN =0.738) the measurement constructs employed in the study are distinguishable from each other.

Table 3. Discriminant Validity

Fornell-Larcker Criterion

	INNO	KNOWSHARIN	FPERF
INNO	0.827		
KNOWSHARIN	0.710	0.808	
FPERF	0.856	0.738	0.702

Further, we employ the Heterotrait-Monotrait Ratio to evaluate the discriminant validity of the study construct. Per Clark and Watson (1995) and Kline (2011), the acceptable value should be 0.85 or less. However, Gold et al. (2001) and Teo et al. (2008) also propose an acceptance correlation threshold of 0.90. Therefore, based on these literature our results depicted in table 4 (KNOWSHARIN and INNO=0.880, FPERF and INNO=0.84, and FPERF and KNOWSHARIN =0.86) all fall within the acceptable thresholds. Therefore, the measurement constructs are formally established by the Fornell-Larcker Criterion are unrelated.

Table 4. Heterotrait-Monotrait Ratio (HTMT)

	INNO	KNOWSHARIN	FPERF
INNO			
KNOWSHARIN	0.88		
FPERF	0.84	0.86	

***Note:** INNO (Innovation types); KNSHARIN (Knowledge Sharing); FPERF (Firm Performance)

Next, we estimate the possibility of multicollinearity between the variables using the variance inflation factor (VIF). Per the acceptance or rejection of the null hypothesis criterion, values of the VIF should not exceed 10.00. Therefore, given the output in table 5, we can reject the null hypothesis because all the values reported are within 10.00 bound. Thus, we can proceed to estimate the structural equation model in the next step.

Table 5. Collinearity Statistics (VIF)

Items	VIF
CSPERF	2.811
INNOPERF	4.906
KNOWSHARIN 1	2.406
KNOWSHARIN 10	2.393
KNOWSHARIN 2	2.334
KNOWSHARIN 3	2.526
KNOWSHARIN 4	2.283
KNOWSHARIN 5	2.362
KNOWSHARIN 6	2.398
KNOWSHARIN 7	2.467
KNOWSHARIN 8	2.497
KNOWSHARIN 9	2.218
MKTINNO	2.408
MKTPERF	1.606
ORGINNO	4.044
PROCINNO	2.768
PRODINNO	2.606
PROFIT	3.745

***Note:** VIF (Variance Inflation Factor); CSPERF (Customer Service Performance); INNOPERF (Innovation Performance); KNOWSHARIN (Knowledge Sharing); MKTINNO (Marketing innovation); MKTPERF (Market Performance); ORGINNO (Organizational innovation); PROCINNO (Process innovation); PRODINNO (Product innovation); PROFIT (Profitability)

4.2 Structural Model Analysis

The research hypotheses are accepted or rejected using results from the SmartPLS estimate. Accordingly, the path estimate, t-statistics, and the p-value (<0.05) provides the basis for acceptance or rejection. Table 6 show the results of the SmartPLS estimates. Following, the estimate shows that both technological and non-technological innovation have statistically significant relationships with knowledge sharing with probability values of 0.00^a. Further, technological and non-technological innovations have statistically significant influence on the performance of the five-star rated hotels. Again, knowledge sharing show statistically significance influence on the performance of these hotels in Ghana. Per figure 1, the strength of the relationship between innovation and firm performance indicates that non-technological innovation has a stronger tie with firm performance. However, the difference between technological and non-technological innovation is marginal. On the mediating role of knowledge sharing in the relationship between technological and non-technological innovation and the performance of the five-star hotels, the result show statistically significant mediation. Thus, the relationship between innovation and firm performance can be explained by the knowledge sharing activities in the hotels.

Table 6. Path Coefficient

Path	Path estimate	Standard Deviation	t- Statistics	p- Values	Results
INNO -> KNOWSHARIN	0.939	0.006	144.796	0.000	Supported
INNO -> FPERF	0.642	0.036	17.664	0.000	Supported
KNOWSHARIN -> FPERF	0.335	0.037	9.078	0.000	Supported
Mediation Effect					
INNO -> KNOWSHARIN -> FPERF	0.315	0.035	8.936	0.000	Supported

***Note:** INNO (Innovation types); KNOWSHARIN (Knowledge Sharing); FPERF (Firm Performance)

To establish the robustness of the model or the ability of the model to perform better above a zero model, we employ the R square and the adjusted R² and, F-statistics respectively. Per the results in table 7, both the R square and the adjusted R² values are above 0.5 to explain that the model performs more than 80% better than a zero model. Further, the F-statistics supports this assertion with values above 0.05. Therefore, the interpretations from the model reflects a robust process of estimation.

Table 7. Quality Criteria

Construct	R Square	R Square Adjusted
KNOWSHARIN	0.881	0.881
PERF	0.928	0.928

F-Square

	INNO	KNSHAR	PERF
INNO		7.421	0.679
KNOWSHARIN			0.186
PERF			

*Note: INNO (Innovation); KNOWSHARIN (Knowledge Sharing); FPERF (Firm Performance)

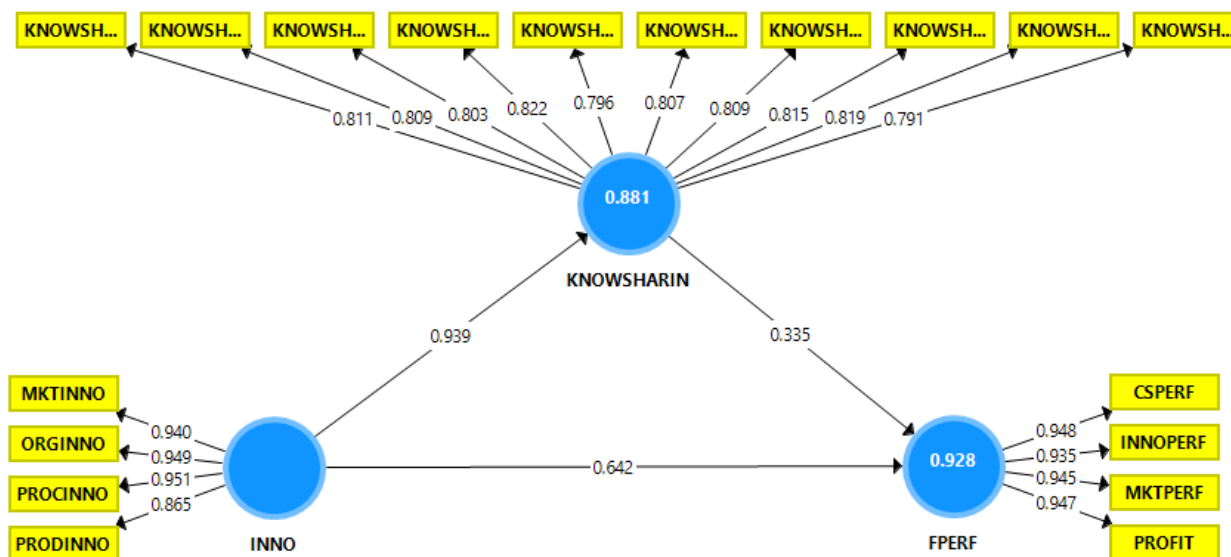


Figure 2. The SEM-PLS Estimation Model for the Mediation Effect

5. DISCUSSION :

The study estimates the relationship between innovation and firm performance using the SmartPLS in a structural equation model. Further, it tests the mediating role of organizational knowledge sharing in the relationship between the variables.

Technological and non-technological innovation influences knowledge sharing in the five-star rated hotels in Ghana. This outcome is synonymous with existing studies (Wang, 2019; Park et al., 2006; Ramadani et al., 2019). Technological innovations which involves the use of software, , and equipment to improve the services of these hotels has the ability to drive organizational knowledge sharing because the use of new software, hardware, or equipment in the hotels encourages employees to communicate, share ideas, and acquire new knowledge. Therefore, systematic training programmes should be organized by these hotels to intentionally promote knowledge sharing between employees in these hotels. Further, non-technological innovations involves the use of new methods and procedures to reduce cost and improve service delivery in these hotels. The use of these forms of innovation can improve knowledge sharing because employees have to undergo retraining to be accustomed to these processes and methods. Consequently, this promotes new knowledge acquisition, processing, and sharing between the employees. Thus, for these hotels to

improve performance, employees should be encouraged to constantly share knowledge with their colleagues to reduce the learning curve and improve performance.

Technological and non-technological innovation influences the firm performance of the five-star rated hotels in Ghana. According to (Lin, 2014; Ramadani et al., 2019), technological and non-technological innovation influences the performance of firms. However, some studies contradict this results concerning non-technological innovation (Atalay et al., 2013). In this case, the technological innovations improves the performance of these hotels in Ghana because it provides a wider coverage for the hotels, it supports easy bookings, and access to customer reviews. Therefore, hotels in Ghana irrespective of their size should invest in technological innovations to increase the probability of improving firm performance. Again, non-technological innovations also increases the chances of these hotels improving firm performance because new or improved methods and processes reduces waste, maximizes resource usage, and improves firm performance. Consequently, hotels should not be tempted to focus only on technological innovations but must endeavor to make strategic decisions which focuses on non-technological innovations.

Knowledge sharing in the star-rated hotels in Ghana influences the performance of the hotels. Empirically, knowledge sharing improves work-related performance of employees, reduces the learning curve, and eventually improves firm performance (Hartono & Sheng, 2016)

(Yao et al., 2020). Consequently, knowledge sharing in these hotels would improve both financial and non-financial performance. Thus, these hotels should design organizational climate which promotes intentional knowledge sharing to increase the chances of improving firm performance. Further, the training and development programs of the hotels should focus on creating a knowledge sharing platform for employees to freely communicate and share work-related idea. Further, knowledge sharing in the star-rated hotels in Ghana mediates the positive relationship between technological and non-technological innovation and the performance of these star-rated hotels. Thus the relationship between innovation and firm performance in these hotels is explained by knowledge sharing. This is consistent with existing studies (Yao et al., 2020; Wang et al., 2016) to prove that organizations promoting organizational knowledge sharing has a higher probability of improving innovation and firm performance. Therefore, this reaffirms theories supporting the significance of organizational knowledge sharing in promoting innovation and firm performance.

6. CONCLUSION:

The study establishes the nexus between innovation and firm performance in Ghanaian five-star rated hotels. The preliminary analysis concerning the reliability and validity of the research instrument confirms result from the structural equation model performs better above a zero model.

The study confirms that both technological and non-technological innovation in the Ghanaian five-star-rated hotels influences knowledge sharing. It surmises the significance of these technologies in the advancement of organizations (Tian et al., 2021; Younas & Rehman, 2020). This is explained by the need for employees to acquire new knowledge and skills to effectively utilize these technologies. Again, it could be explained by the human resource programs designed by these hotels to provide support for both new and existing employees to promote knowledge creation, dissemination, and assimilation. Therefore, management of these hotels are encouraged to consistently devise modern human resource strategies to take advantage of technological and non-technological innovations in the hotels.

Technological and non-technological innovation influences the firm performance of the five-star rated hotels in Ghana. Thus, the survival and growth of these hotels depends on their ability to consistently innovate to keep up with current market demands. The technological innovations support improved firm performance because with the diffusion of modern technology, customers can gain access to information about the hotels before making informed decisions. Further, these hotels now have wider market coverage with the diffusion of social media technologies. The non-technological innovation improves the performance of these hotels because advanced methods of service provision reduces cost, waste, and improves efficiency. Therefore, given the high cost of running these hotels, there is the need for these hotels to embrace advanced methods which supports lean management at the highest efficiency.

Knowledge sharing in the star-rated hotels in Ghana influences the performance of the hotels. The diffusion of new technologies requires the support of management and employees. Thus, the ability of institutions to quickly train, share knowledge, and communicate concerning new technologies improves efficiency. The study confirms that knowledge sharing in the star-rated hotels in Ghana mediates the positive relationship between technological and non-technological innovation and the performance of these star-rated hotels. Conscious human resource programs should be

designed to train new and old employees to support communication, knowledge sharing and eliminate fear. These factors are significant to the efficient management of the hospitality industry gearing up for the uptake of new innovations.

7. LIMITATIONS AND IMPLICATIONS FOR FUTURE STUDIES:

The study explores a contemporary issue which has the potential to transform the hospitality industry of Ghana. However, the scope of the study eliminates other hotels which are not rated. Therefore, there is the need for future studies to consider other hotels to confirm this result to support generalization. Again, the hospitality industry has other class of businesses which could be explored. Finally, while this study employs the structural equation model, future studies can explore these relationship with other econometric methods.

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Appendix

Code No.	TYPE OF INNOVATION	Scale
PRODINNO	Product/Service/Facility Innovation	Ordinal
PRODINNO1	We have luxury rooms with automated key card.	
PRODINNO 2	We use Nano technology textile products in guest rooms.	
PRODINNO 3	We have free beverage kits tablet menus in guest rooms.	
PRODINNO 4	We have new tourism products like health tourism and agri-tourism.	
PRODINNO 5	We have loyalty programs.	
PROCINNO	Process Innovation	Ordinal
PROCINNO1	We have wireless internet access.	
PROCINNO 2	We have computerized management and surveillance systems.	
PROCINNO 3	We have processes concerning communication with guests prior to visit and payment.	
PROCINNO 4	We use robots for cleaning services.	
PROCINNO 5	We have IT based reservation and booking system.	
MKTINNO	Marketing Innovation	Ordinal
MKTINNO1	We invest in technology to expand our Internet booking system.	
MKTINNO 2	We have launched a new loyalty program.	
MKTINNO 3	We have implemented a new exclusive Information and Reservation Center.	
MKTINNO 4	Marketing method used in our hotel before is different from the one used now	
ORGINNO	Organizational Innovation	Ordinal
ORGINNO1	Our hotel regularly examines and improves rules and operating processes.	
ORGINNO 2	Our hotel rapidly responds to service questions.	
ORGINNO 3	Our hotel strives to listen to employees and respond to their suggestions	
ORGINNO 4	Our hotel has quick speed for developing new project	
ORGINNO 5	Our hotel has a high level of cooperation between individuals and the organisation.	
	FIRM PERFORMANCE	
PROFIT	Profitability Performance	Ordinal
PROFIT1	we have experienced increasing economic value added	
PROFIT 2	our return on equity has been improving	
PROFIT 3	firms net income/revenue is increasing steadily	
PROFIT 4	return on investment helps maintain our investor	
PROFIT 5	we have experienced increasing earnings before tax	
MRKPERF	Market Performance	Ordinal
MRKPERF1	the firm can allocate a portion of its profit to owners	
MRKPERF 2	the firm experienced appreciation in its worth	
MRKPERF 3	we are getting more cashback for each cedi invested	
MRKPERF 4	market fluctuations have been favourable to the firm	
MRKPERF 5	the firm is experiencing increasing product value	
CSPERF	Customer Satisfaction	Ordinal
CSPERF1	our customers are satisfied with our mix of products/services	
CSPERF 2	we receive less number of complaints	
CSPERF 3	our products have a high repurchase rate	
CSPERF 4	we have high new customer retention	
CSPERF 5	there are several new products/services launched	

INNOPERF	Innovative Performance	Ordinal
INNOPERF1	the hotel is experiencing a rise in percentage of new products/services	
INNOPERF 2	our firm has innovations introduced for work processes and procedure	
INNOPERF 3	we are experiencing increase in new products/service projects	
INNOPERF 4	renewing the administrative system and mind set regarding the firm's environment	
INNOPERF 5	the skills of our employees are improving	
KNSHARIN	Knowledge Sharing	Ordinal
KNSHARIN1	We learn and share knowledge among different teams	
KNSHARIN 2	We believe that units should help each other through teamwork to foster knowledge sharing	
KNSHARIN 3	In a team setting, we share knowledge with colleagues who had assisted the hotel in the past	
KNSHARIN 4	We want to become a hotel with professional knowledge in the eyes of our colleagues	
KNSHARIN 5	We believe that knowledge sharing among units can help establish our image as experts	
KNSHARIN 6	We respect others' impression that we are willing to assist people	
KNSHARIN 7	We help our units in addressing work problems.	
KNSHARIN 8	We enjoy exchanging knowledge among the various unit	
KNSHARIN 9	We use our spare time to help other units in the hotel when needed	
KNSHARIN10	We help other units regardless of whether or not they ask for help	