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The impact of knowledge management on innovation in small and medium enterprises in Vietnam

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Abstract:

This article aims to examine the impact of knowledge management processes - acquisition, creation, sharing, storage, and utilisation - on innovation within small and medium enterprises (SMEs) in Vietnam. Using a quantitative approach, we collected primary data from SME managers via a structured questionnaire and employed multiple regression analysis to test our hypotheses. The findings indicate that all knowledge management processes positively influence innovation, with knowledge sharing exerting the most significant impact. This highlights the crucial role of facilitating knowledge exchange among employees and external stakeholders in driving creativity and improving business performance. Based on these findings, the study offers practical recommendations for SME managers, emphasising the need to develop structured knowledge-sharing systems, invest in knowledge storage mechanisms, and effectively leverag existing expertise to promote innovation. Furthermore, policymakers are encouraged to create supportive environments that enable SMEs to effectively implement knowledge management strategies. By strengthening these processes, Vietnamese SMEs can enhance their innovation capacity and achieve long-term sustainability in an increasingly competitive market.

Keywords: **innovation, knowledge management, quantitative analysis, small and medium enterprises, Vietnam.**

Classification numbers: **2.1, 2.2, 7**

1. Introduction

In Vietnam, SMEs constitute a significant proportion, accounting for 97 percent of the total number of enterprises. They contribute to nearly 41.24 percent of the total capital and generate 42.11 percent of job opportunities. Moreover, the SME sector plays a crucial role in fostering sustainable growth, ensuring social security, and alleviating poverty. Therefore, enhancing competitiveness to facilitate these organisations' positive and sustainable development is imperative. Despite a growing awareness of the importance of innovation, the reality reveals that the innovation capabilities of SMEs in Vietnam have not yet reached their expected potential. A common characteristic of SMEs is their limited access to capital and resources, which makes it challenging to pursue innovation activities that require substantial financial investments, such as technology upgrades. Consequently, it is imperative to research to identify pre-existing factors, such as knowledge management, that can enhance innovation activities for SMEs.

Recent studies indicate that knowledge management influences innovation [1-4]. Knowledge management is defined as the process of selecting, zoning, storing, classifying, sharing, and communicating information that is essential for an organisation's business operations, to enhance its efficiency and competitiveness [4]. Enterprises can apply knowledge management to fill gaps in knowledge, combine internal and external knowledge, and make the organisation's knowledge base more usable for innovation. Empirical studies examining the influence of knowledge management processes on innovation often focus on the context of large-scale enterprises, firms operating in the high-technology sector, and those that actively implement professional knowledge management processes and strategies, considering the application of knowledge management to innovation as a source of competitive advantage [1, 5, 6] but tend to overlook the context of small and medium-sized enterprises. Several previous studies have shown that SMEs lack a comprehensive knowledge management system, and if they are implemented, their knowledge management process is often simpler than that of large-scale enterprises [7]. However, this does not imply that the application of knowledge management has little impact on the innovation activities of these organisations.

In Vietnam, most studies exploring the impact of knowledge management on innovation in enterprises focus solely on understanding the individual impact of one or a few knowledge management processes on innovation [6]. In contrast, various global studies have shown that multiple knowledge management processes influence innovation in enterprises [4]. Furthermore, the identification of knowledge management processes in these studies are often inherited from previous research without evaluating their suitability within the context of SME research in Vietnam. Therefore, identifying and assessing knowledge management processes existing within Vietnamese SMEs and their influence on innovation activities would offer a comprehensive understanding of knowledge management

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and innovation within this sector. Drawing on the theoretical and practical imperatives previously discussed, this research evaluates the impact of knowledge management on innovation in SMEs. Additionally, it seeks to offer actionable governance recommendations tailored to the unique context of Vietnamese SMEs.

The remainder of the paper is structured as follows: It begins with the relevant literature and previous studies about knowledge management processes, as well as other previous studies that link knowledge management with innovation. Then the methodology is presented, followed by testing the proposed hypotheses in the data analysis section. Finally, the authors discuss the findings, conclusions, and policy recommendations.

2. Theory and hypotheses

According to the resource-based view theory [8], the internal environment of an organisation is the key factor explaining its superior performance. Consequently, organisations should concentrate on valuable, rare, and hard-to-replicate resources such as reputation, innovation capacity, knowledge, and improvisational ability. The knowledge-based view theory is seen as an evolution of the resource-based view theory. This theory places knowledge at the forefront as an essential, scarce, and valuable resource within a firm. Knowledge is the core element that delineates the boundaries of enterprises, and knowledge management processes, including acquisition, storage, replication, transfer, and creation of knowledge within the organisation, are of paramount importance. Based on the resource-based view theory and knowledge-based view theory, numerous empirical research studies have shown the positive impact of knowledge management on innovation within businesses [1-5]. The process of innovation in enterprises involves multiple steps, including ideation, assimilation, and implementation of new ideas or novel approaches. Interestingly, these processes align closely with knowledge management practices within organisations.

The crucial roles of knowledge management in innovation are identified in the research of [9]. These roles include sharing and encoding tacit knowledge, a type of knowledge that competitors find difficult to imitate. Knowledge management creates a favourable environment for the innovation process within organisations. Moreover, it provides tools, processes, and platforms that make knowledge readily available and accessible. Innovation and creativity are perceived as processes synthesising available knowledge in diverse ways. Therefore, knowledge management ensures that the knowledge gathered from both internal and external sources can be utilised as inputs for the innovation process.

The management research overview indicates that knowledge management's influence on innovation is commonly structured along the lines of knowledge management processes. These knowledge management processes highlighted in studies include knowledge acquisition, knowledge storage, knowledge sharing, knowledge creation, and knowledge utilisation.

Knowledge acquisition processes are intended to obtain useful knowledge by creating it or absorbing it from internal/external sources [10]. This can be done by hiring new individuals, renting external knowledge, creating a research and development unit that is dedicated to capturing new knowledge, and having employees who can acquire new knowledge quickly and have the openness to learn new skills, thereby promoting innovation in the organisation [3]. In conclusion, the following hypothesis is proposed.

Hypothesis 1: Knowledge acquisition positively affects innovation in SMEs.

Knowledge creation processes refer to the activity of developing new and useful ideas and solutions related to different aspects of an organisation, such as improving product quality, changing technological processes, and changing process management. The positive influence of knowledge creation on innovation outcomes in enterprises has also been demonstrated in many studies [11-13]. In conclusion, the following hypothesis is proposed.

Hypothesis 2: Knowledge creation positively affects innovation in SMEs.

Knowledge storage processes are designed to facilitate the retention and manipulation of knowledge [5, 11]. Knowledge storage helps future generations access knowledge and reduces the risk of organisations losing knowledge when employees retire or quit. However, another study showed that knowledge storage has no significant effect on innovation [6] because knowledge storage primarily focuses on ensuring document accessibility rather than generating new knowledge. The subjects of this study are SMEs characterised by high employee turnover rates. Consequently, the research anticipates that knowledge storage will have a significantly positive impact on innovation and creativity within these enterprises. In conclusion, the following hypothesis is proposed.

Hypothesis 3: Knowledge storage positively affects innovation in SMEs.

Knowledge sharing processes are the exchange of knowledge and experience within an enterprise and between an enterprise and external organisations. Many studies demonstrated that knowledge sharing has a positive effect on innovation outcomes in enterprises [4, 13]. Encouraging knowledge sharing among employees and departments reduces individual learning time, enhances teamwork, and contributes to generating new knowledge. Knowledge sharing also helps businesses mitigate risks associated with workforce fluctuations, especially unexpected departures of experienced staff. In conclusion, the following hypothesis is proposed.

Hypothesis 4: Knowledge sharing positively affects innovation in SMEs.

Knowledge utilisation processes are concerned with applying knowledge to create value for enterprises. The positive influence of knowledge utilisation on innovation outcomes in enterprises has also been demonstrated in many studies [12, 14]. This process involves applying knowledge and information to the organisation's operational and business processes to yield clear innovation outcomes, such as product innovation, service innovation, and the creation of new procedures and regulations. In conclusion, the following hypothesis is proposed.

Hypothesis 5: Knowledge utilisation positively affects innovation in SMEs.

Building on the abovementioned theoretical analysis, this article posits a theoretical framework for the impact of knowledge management processes on innovation among Vietnamese SMEs, as shown in Fig. 1. This model shows the independent variables (knowledge processes), the dependent variable (innovation), and the proposed relationship between them. Knowledge processes include knowledge acquisition, knowledge creation, knowledge storage, knowledge sharing, and knowledge utilisation.

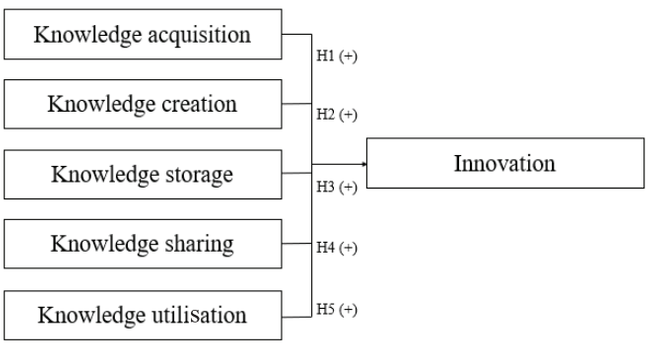

Fig. 1. Research model.

3. Methods

The research aims to explore the impact of knowledge management on innovation in SMEs in Vietnam. Knowledge management involves integrating various processes related to organisational knowledge to enhance productivity, profitability, and development capability. Innovation is defined as a firm's activities in improving existing products or developing new ones; it also involves enhancing current operating processes or creating new ones to improve performance relative to key competitors and the business itself in previous years. The study considers knowledge management and innovation at the organisational level and does not focus on individual-level research. The major elements of this research are established based on preceding literature, both theoretically and empirically.

Knowledge acquisition processes (ACQ) are intended to obtain useful knowledge by creating it or absorbing it from internal/external sources. Accordingly, knowledge acquisition has been measured using five questions adapted from B.Y. Obeidat, et al. (2016) [4].

Knowledge creation processes (CRE) involve developing new and useful ideas and solutions relevant to different aspects of an organisation. Knowledge creation has been measured using four questions adapted from J.B. Barney (1991) [8].

Knowledge storage processes (STO) are designed to facilitate the retention and manipulation of knowledge [5, 11]. Accordingly, knowledge storage has been measured using four questions adapted from T. Andreeva, et al. (2011) [11].

Knowledge sharing processes (SHA) involve the exchange of knowledge and experience within an enterprise and between an enterprise and external organisations. This variable has been measured using five questions identified from T. Andreeva, et al. (2011) [11].

Knowledge utilisation processes (UTI) are concerned with applying knowledge to create value for enterprises. Knowledge utilisation has been measured using five questions adapted from B.Y. Obeidat, et al. (2016) [4].

In this study, innovation (IN) will be considered as the dependent measure since it has been recognised as a direct result of knowledge management effectiveness and one of the main objectives for knowledge-creating companies to obtain competitive advantages. Accordingly, innovation has been measured by eight questions which are adapted from M.J. Donate, et al. (2011) [5].

To explore the relationship between the independent variables (KM processes) and the dependent variable (innovation), these variables were measured using a five-point Likert scale ranging from not applied at all = 1 to fully applied = 5. Reliability and validity analyses were conducted; descriptive analysis was used to describe the characteristics of the sample and the respondents to the questionnaires, alongside the independent and dependent variables. The data analysis methods used to test the research hypotheses include Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and multiple regression analysis.

The research sample size was determined based on the number of observed variables and the research scope, typically requiring a minimum of 5-10 times the number of observed variables for factor analysis and regression analysis [15]. In this study, with 22 observed variables in the model, a minimum sample size of 220 businesses was required, based on the 1:10 ratio. The research employed a convenience sampling approach, a non-probability sampling technique involving selecting elements based on their availability and suitability for the research objectives. The selected businesses had to meet the following criteria: firstly, adhere to the definition outlined in the Government's Decree No. 39/2018/ND-CP issued on March 11, 2018; secondly, have a minimum of 3 years of operational history.

Two months after the survey commencement, the authors collected 358 responses, achieving a response rate of 67.04%. The lower-than-expected number of surveys collected can be attributed to several factors, including some businesses being unreachable via email or phone, certain businesses having relocated, and some businesses being unwilling to participate in the questionnaire. Most of the enterprises that did not receive questionnaires were primarily micro-enterprises. The authors conducted a survey screening process, eliminating invalid questionnaires, such as those with missing essential information or lacking more than 10% of the required data. In the end, 332 out of

the 358 questionnaires met the criteria for data entry and analysis, resulting in a retention rate of 92.74%. The authors also conducted a check for duplicate entries and found that all 332 observations were entirely independent, with no duplications.

Regarding the survey area, the authors made efforts to collect data in line with the initial expectations. However, the number of valid survey questionnaires suitable for analysis was sufficient to meet the minimum expected data requirement (332 questionnaires). Nevertheless, the allocation of collected questionnaires was overall reasonably well-balanced and acceptable for processing and analysis.

As indicated in Table 1, the demographic profile of the respondents for this study shows that they are typically males (70.48%), bachelor's degrees (63.55%), and about 41.87% percent of them have 6 to 10 years of experience. The information regarding the survey respondents indicates that the collected data is highly valuable for research. The interview participants are mature in age, possess a high level of expertise, have extensive work experience in the business sector, and demonstrate a profound understanding of management issues within enterprises.

Table 1. Description of the respondent's demographic profiles.

Category	Frequency	(%)
Gender		
Male	234	70.48
Female	98	29.52
Total	332	100.00
Qualification		
High school	89	26.81
College/University	211	63.55
Postgraduate	32	9.64
Total	332	100.00
Experience		
3 to less than 5 years	126	37.95
6 to less than 10 years	139	41.87
More than 10 years	67	20.18
Total	332	100.00

Source: Authors' calculation.

As indicated in Table 2, the number of years of operation of businesses showed a statistically insignificant difference. The authors divided it into three categories: 3-5 years, 6-10 years, and >10 years, with businesses operating for 3-5 years accounting for 37.65%, those operating for 6-10 years at 30.72%, and those with more than 10 years of operation comprising 31.63% of the sample. In terms of business sectors, within the survey sample, 23 businesses were operating in the Agriculture, Forestry, and Fisheries sector, accounting for 6.93%; 72 businesses in Industrial & Manufacturing, representing 21.69%; and 237 businesses in Commerce and Services, making up the remaining 71.38%.

Table 2. Description of the SME demographic profiles.

Category	Frequency	(%)
Labor scale		
<10	89	26.80
10-50	169	50.90
51-100	42	12.66
101-200	19	5.72
201-300	13	3.92
Total	332	100.00
Years		
3 to less than 5 years	125	37.65
6 to less than 10 years	102	30.72
More than 10 years	105	31.63
Total	332	100.00
Business field		
Agriculture, forestry, seafood	23	6.93
Industrial production	72	21.69
Commerce, Services	237	71.38
Total	332	100.00

Source: Authors' calculation.

4. Results

To evaluate the knowledge management situation in small and medium-sized enterprises in Vietnam, the study utilised mean scores and standard deviations for the following dimensions: knowledge acquisition, knowledge creation, knowledge storage, knowledge utilisation, knowledge sharing, and innovation. As indicated in Table 3, the average values of the responses regarding the knowledge management processes fluctuate around 4, which is significantly higher than the neutral point of 3. This indicates that the survey participants have a relatively high level of agreement with the survey questions. The survey results suggest that the current state of innovation is at an above-average level (average = 3.83; standard deviation = 0.426). Among these, the aspect that received the highest rating is "Development of new products". This suggests that Vietnamese SMEs are currently showing a keen interest in their innovation activities. However, innovation activities have not yet gained strong momentum, as businesses do not consider them strategically significant for their operations. This is reflected in the relatively lower scores for aspects related to the active improvement of existing products and the creation of new products.

Table 3. Mean and standard deviation of the study's variables.

Variable	Mean	SD
Knowledge acquisition	***4.26***	***0.50***
We hire new employees as a source for acquiring new knowledge	4.22	0.68
We encourage employees to acquire knowledge from different sources	4.29	0.67
We provide an open environment to help our employees acquire new knowledge	4.24	0.63
We actively observe and adopt the best practices in our sector	4.24	0.64
We list and define the knowledge we possess as well as any unavailable knowledge	4.30	0.65
Knowledge creation	***4.19***	***0.61***
Our organisation frequently comes up with new ideas about our products and/or services	4.25	0.72
Our organisation frequently comes up with new ideas about our working methods and processes	4.17	0.79
If a traditional method is not effective anymore our organisation develops a new method	4.19	0.72
Our organisation uses existing know-how in a creative manner for new applications	4.17	0.71
Knowledge storage	***3.91***	***0.60***
Our organisation does a lot of work to refine, organise, and store the knowledge collected	4.14	0.69
Our organisation possesses many useful patents and licenses	4.09	0.70
In our organisation, we are used to documenting in writing lessons that are learned in practice	3.74	0.78
In our organisation, we make sure that the most important experiences gained are documented	3.69	0.79
Knowledge sharing	***3.63***	***0.83***
In our organisation, information and knowledge are actively shared within units	3.45	1.00
In our organisation, employees and managers exchange a lot of information and knowledge	3.48	1.04
Our organisation shares a lot of knowledge and information with strategic partners	3.81	0.93
Our employees are systematically informed of changes in procedures, instructions, and regulations	3.79	0.95
Knowledge utilisation	***4.06***	***0.63***
There are incentive and benefit policies for new ideas and suggestions in utilising existing knowledge	4.11	0.83
Workflow diagrams are required and used in performing tasks	4.08	0.75
The firm effectively manages different sources and types of knowledge	4.04	0.76
The firm utilises available knowledge to improve services provided to its customers	4.04	0.77
The firm applies available knowledge to improve its performance	3.99	0.75
Innovation	***3.83***	***0.47***
Development of new production methods and procedures	3.83	0.57
Development of improvements for existing methods and procedures	3.82	0.53
Introduction of more new (or improved) methods and procedures than its major competitors	3.82	0.55
Introduction of more new (or improved) methods and procedures than three years ago	3.82	0.57
Development of new products	3.86	0.51
Modification and/or improvement of existing products	3.85	0.59
Introduction of more new (or improved) products than its major competitors	3.82	0.57
Introduction of more new (or improved) products than three years ago	3.85	0.52

Source: Authors' calculation.

Table 4. Item-total statistics.

Variables	Scale mean if item deleted	Scale variance if item deleted	Corrected item - total correlation	Cronbach's alpha if item deleted
Knowledge acquisition - Alpha = 0.831				
ACQ1	17.07	4.212	0.612	0.800
ACQ2	17.00	4.139	0.670	0.783
ACQ3	17.05	4.396	0.601	0.803
ACQ4	17.05	4.309	0.625	0.796
ACQ5	16.99	4.275	0.626	0.796
Knowledge creation - Alpha = 0.848				
CRE1	12.52	3.573	0.677	0.811
CRE2	12.60	3.316	0.694	0.805
CRE3	12.58	3.543	0.699	0.801
CRE4	12.61	3.599	0.677	0.811
Knowledge storage - Alpha = 0.821				
STO1	11.52	3.616	0.618	0.787
STO2	11.58	3.592	0.620	0.786
STO3	11.92	3.242	0.674	0.761
STO4	11.98	3.202	0.670	0.764
Knowledge sharing - Alpha = 0.869				
SHA1	11.08	6.302	0.741	0.824
SHA2	11.05	5.907	0.799	0.800
SHA3	10.72	6.867	0.684	0.847
SHA4	10.74	6.838	0.665	0.854
Knowledge utilisation - Alpha = 0.875				
UTI1	16.15	6.277	0.714	0.846
UTI2	16.18	6.648	0.705	0.847
UTI3	16.22	6.506	0.737	0.840
UTI4	16.22	6.573	0.701	0.848
UTI5	16.27	6.818	0.660	0.858
Innovation - Alpha = 0.904				
IN1	26.83	8.874	0.710	0.890
IN2	26.84	9.142	0.675	0.894
IN3	26.84	9.001	0.693	0.892
IN4	26.84	8.874	0.710	0.890
IN5	26.80	9.185	0.701	0.892
IN6	26.81	8.720	0.734	0.888
IN7	26.84	8.954	0.678	0.893
IN8	26.81	9.254	0.660	0.895

Source: Authors' calculation.

Reliability analysis involves assessing the degree of consistency among multiple measurements of a variable, while validity analysis pertains to the extent to which a scale or set of measures accurately represents the construct it is intended to measure, aligning with the researcher's intended measurement goals. In our case, we focused on measuring the reliability of the instrument using Cronbach's alpha coefficient. All indicator values or dimensional scales must exceed the recommended threshold of 0.60. As indicated in Table 4, the results present

Cronbach's alpha for both the independent and dependent variables. All Cronbach's alpha coefficients for the tested variables exceed 0.60, indicating the reliability of the composite measure. Furthermore, the items selected to measure the independent and dependent variables were validated and adapted from previous research. Therefore, our approach to enhancing scale validity involved using a previously validated instrument developed by other researchers. Additionally, the questionnaire items underwent review by four professors from the Business Administration departments at two universities in Hanoi. The feedback provided during the pre-test phase contributed to improved content validity for the instrument.

All measurement scales and observed variables met the Cronbach's alpha reliability test. The initial dataset was randomly divided into two independent groups: the first, comprising 166 samples, was used for EFA; the second, also with 166 samples, was used for CFA.

To confirm the validity of the EFA, standard pre-analysis procedures were performed. The Bartlett's Test of Sphericity revealed a highly significant correlation within the correlation matrix ($p<0.001$). The Kaiser-Meyer-Olkin measure (KMO=0.799), which satisfies the condition $0.5 \leq KMO \leq 1$, indicatesd the suitability of factor analysis. The extracted variance =67.547% and eigenvalues=1.591>1 indicate that 67.547% of the variance of each factor is explained by the observed variables of the factor. The Promax rotation method was employed to more accurately reflect the data structure and facilitate easier observation. The analysis results indicate that all observed variables have factor loading coefficients greater than 0.5, which is suitable for a sample size of less than 350 (Table 5).

Table 5. Rotated component matrix.

	Component				
	1	*2*	*3*	*4*	*5*
UTI3	0.851				
UTI2	0.813				
UTI1	0.801				
UTI4	0.795				
UTI5	0.764				
ACQ4		0.777			
ACQ2		0.764			
ACQ3		0.763			
ACQ5		0.740			
ACQ1		0.736			
SHA2			0.912		
SHA1			0.897		
SHA3			0.754		
SHA4			0.713		
STO2				0.826	
STO3				0.813	
STO4				0.800	
STO1				0.771	
CRE3					0.810
CRE4					0.808
CRE2					0.781
CRE1					0.767
Extraction method: Principal component analysis Rotation method: Varimax with kaiser normalisation					

Source: Authors' calculation.

The CFA method was used to examine the suitability of the theoretical model with the research data and to test the convergence, discriminant, and reliability of the model. Through the CFA method, the chi-squared value was adjusted for degrees of freedom (Cmin/df)=1.135<5; TLI index and CFI comparability index >0.9; RM-SEA index=0.029<0.05. The calculation results show that the model's indicators are satisfied, and the model is accepted with the research data, indicating that the measurement model fits well with the actual data.

Table 6. Correlation matrix and discriminant value.

	CR	AVE	MSV	MaxR(H)	UTI	SHA	ACQ	CRE	STO	IN
UTI	0.887	0.612	0.158	0.889	0.782					
SHA	0.881	0.649	0.384	0.882	0.067	0.806				
ACQ	0.817	0.473	0.138	0.822	0.034	0.180†	0.688			
CRE	0.854	0.595	0.249	0.855	0.115	0.182	0.152	0.771		
STO	0.796	0.495	0.167	0.802	-0.074	0.062	0.189†	0.245	0.704	
IN	0.889	0.501	0.384	0.891	0.398	0.620	0.372	0.499	0.408	0.708

Note: CR: Composite reliability, AVE: Average variance extracted, MSV: Maximum shared variance, MaxR(H): Maximum reliability.
Source: Authors' calculation.

Indicators commonly used to assess reliability and accuracy in CFA analysis include factor loadings (FLs), composite reliability (CRs), and average variance extracted (AVE) of factors. The results show that the value of CRs is higher than 0.6. However, the AVE value of the knowledge acquisition scale is less than 0.5, so it is necessary to return to the original CFA model (Table 6). In the EFA analysis of this scale, observed variables with low loading factors (ACQ1; ACQ5; STO2) were identified and subsequently removed. After removing these observed variables from the original CFA model, the CFA model still ensures a fit with the chi-squared value adjusted for degrees of freedom (Cmin/df)=1.126<5; TLI index and relevant index for comparison CFI=0.981>0.9; RM-SEA index=0.028<0.05 and CR values>0.6, AVEs are higher than 0.5 and discriminant performance is satisfied if the square root value of AVE is greater than the correlation coefficient between the scales measured and the value of AVE is greater than the MSV satisfying the requirements. Therefore, it can be confirmed that the scales in the research model have both convergent and discriminant values to continue testing the hypotheses. Through the results of CFA analysis, the authors conclude that the independent and dependent variables are consistent with the theoretical model and research data, and the research concepts are reliable, convergent, and discriminant (Table 7).

Table 7. Correlation matrix and discriminant value after adjustment.

	CR	AVE	MSV	MaxR(H)	UTI	SHA	ACQ	CRE	STO	IN
UTI	0.887	0.612	0.158	0.889	0.782					
SHA	0.881	0.649	0.384	0.882	0.067	0.806				
ACQ	0.750	0.501	0.185	0.753	0.068	0.176	0.708			
CRE	0.854	0.595	0.249	0.855	0.115	0.183	0.128	0.771		
STO	0.796	0.527	0.169	0.773	-0.083	0.066	0.238	0.229	0.726	
IN	0.889	0.501	0.384	0.891	0.398	0.620	0.430	0.499	0.411	0.708

Note: CR: Composite reliability, AVE: Average variance extracted, MSV: Maximum shared variance, MaxR(H): Maximum reliability.
Source: Authors' calculation.

This research primarily seeks to investigate the impact of knowledge management processes on innovation in Vietnamese SMEs. Therefore, the multiple regression analysis method was used to investigate the impact of knowledge management processes on innovation in SMEs.

Table 8 indicates that there is a positive correlation between knowledge management processes and innovation in Vietnamese SMEs, which means that the independent variables and dependent variables change in the same direction. The value of R^2 reflects the proportion of variation in innovation variables that could be referred to by the five knowledge management processes. This is to say that 68.8 percent of the variation of "Innovation in SMEs" is explained by five knowledge management processes, while the remaining 31.2% is likely influenced by other factors and random error. The Durbin-Watson index d=1.876 (ranging from 1<d<3) concludes that there is no autocorrelation of residuals. The F-ratio for the data was 146.889, which is significant at p<0.05 (sig=0.0000). Therefore, the model is consistent with the actual data. In other words, overall, the independent variables are linearly correlated with the dependent variable with a 99% confidence level. The VIF coefficients of the independent variables are all less than 2, suggesting no multicollinearity problem among the independent variables (Table 9).

Table 8. Model summary.

Model	R	R^2	Adjusted R^2	Std. Error of the estimate	Durbin-Watson
1	0.832	0.693	0.688	0.23782	1.876
a. Predictors: (Constant), F_UTI, F_STO, F_ACQ, F_SHA, F_CRE					
b. Dependent variable: Innovation					

Source: Authors' calculation.

Table 9. Coefficients.

Model		Unstandardised coefficients		Standardised coefficients	t	Sig.	Collinearity statistics	
		B	*Std. Error*	*Beta*			*Tolerance*	*VIF*
1	(Constant)	0.203	0.158		1.284	0.200		
	F_ACQ	0.093	0.026	0.116	3.592	0.000	0.911	1.097
	F_CRE	0.153	0.023	0.219	6.772	0.000	0.900	1.111
	F_STO	0.169	0.022	0.251	7.785	0.000	0.906	1.104
	F_SHA	0.255	0.016	0.497	15.431	0.000	0.910	1.099
	F_UTI	0.250	0.021	0.371	12.056	0.000	0.996	1.004
a. Dependent variable: Innovation								

Source: Authors' calculation.

Knowledge management processes have a significant impact on enterprise innovation outcomes. This finding aligns with the outcomes of previous research [4]. Ref. [9] emphasised that creating, acquiring, sharing, and using knowledge enhance employees' skills related to innovation. At the organisational level, when a company promotes collaboration among employees and across departments to enhance knowledge sharing, it subsequently boosts innovation.

The independent variables show a high ability to explain the variation of the dependent variable. In terms of their impact on innovation outcomes, the ranking from highest to lowest influence is as follows: (1) knowledge sharing; (2) knowledge utilisation; (3) knowledge storage; (4) knowledge creation; (5) knowledge acquisition. Thus, knowledge sharing has the strongest motivating role with β = 0.497 (p-value = 0.000) (Table 10).

Table 10. The degree of impact of the independent variables.

	Beta	%	The degree of impact
(F_ACQ)	0.116	7.98	5
(F_CRE)	0.219	15.06	4
(F_STO)	0.251	17.26	3
(F_SHA)	0.497	34.18	1
(F_UTI)	0.371	25.52	2
Total	1.454	100	

Source: Authors' calculation.

The estimated results show that knowledge acquisition has a positive influence on innovation in SMEs (β=0.116; p-value=0.000). The continuous collection of relevant internal and external information and knowledge activities of enterprises (including tacit and explicit knowledge) affects the innovation results of enterprises. When businesses have access to effective sources of information, it becomes easier for them to amalgamate this information to come up with new ideas. Research findings suggest that enterprises with well-trained

employees in the company will be a better source of knowledge than hiring new employees to collect such specialised knowledge. The experience of existing staff in handling company processes, consulting case types, and work practices can contribute to better innovation opportunities within the company than hiring new employees who are unfamiliar with the company's environment or business processes. However, hiring/inviting experts to work is definitely beneficial to the innovation outcomes of the business, as new personnel will bring new ways of thinking and can stimulate the creation of new ideas [10].

The estimated results show that knowledge creation has a positive effect on innovation in SMEs (β=0.219; p-value=0.000). This conclusion is consistent with previous studies by [9, 12, 16]. Knowledge creation and innovation outcomes are closely linked, as the creation of new knowledge provides the foundation for the development of innovative actions of all types in organisations.

The research results support the hypothesis that knowledge storage positively affects innovation in SMEs (β=0.251; p-value=0.000). Knowledge storage has a positive influence on innovation because it helps maintain the integrity of knowledge over time, facilitating rapid access to knowledge [17]. A. Majchrzak, et al. (2004) [18] also have a similar opinion when claiming that knowledge encryption has a significant and positive impact on fundamental innovation in enterprises.

Other studies demonstrated that knowledge storage has no significant effect on innovation [6, 19]. These studies argue that knowledge storage focuses on making documents accessible to everyone rather than fostering the creation of new knowledge. In the current study, which centres on SMEs with a high turnover rate, knowledge storage significantly influences innovation.

The estimated results show that knowledge sharing positively affects innovation in SMEs (β=0.497; p-value=0.000). This result is consistent with the findings of previous studies that knowledge sharing has a positive influence on innovation in SMEs [4, 18, 20]. The limitation of knowledge sharing at the individual level is that knowledge holders are unwilling to share most of the knowledge they possess, potentially due to the fear of losing their competitive advantage or diminishing their benefits. Therefore, at the organisational level, it becomes imperative for managers to establish a structured knowledge-sharing process. This process ensures that personnel within the organisation can access knowledge swiftly and comprehensively. Additionally, it is essential to create an environment that fosters information sharing among individuals and across units.

The research results confirm that knowledge utilisation positively affects innovation (β=0.371; p-value=0.000). This result is similar to the study of [12, 14, 20, 21]. Knowledge utilisation involves applying existing knowledge to solve specific tasks, thereby creating value for the business, such as innovating products, services, procedures, and regulations.

5. Conclusions and policy recommendations

This study has contributed new insights to prior research on innovation in SMEs in Vietnam. It helps SME managers to have a more comprehensive view of innovation. Firstly, SMEs are not scaled-down versions of large enterprises. SMEs often lack the financial resources to effectively carry out all knowledge management processes. Therefore, these organisations need to identify which activities are necessary and align them with the practical situation of the enterprise to balance the organisation's resources and make appropriate choices for activities. The results of hypothesis testing indicate the degree of influence of knowledge management processes on innovation activities in the following order of impact, from highest to lowest: (1) knowledge sharing, (2) knowledge utilisation, (3) knowledge storage, (4) knowledge creation, and (5) knowledge acquisition. Consequently, this study recommends that SMEs prioritise resource allocation for knowledge management processes in the mentioned order. Secondly, SME managers should gain a clear understanding of how knowledge management activities impact their enterprise's efficiency. They should also consider potential obstacles and limitations when implementing knowledge management. This understanding will provide them with a clear direction for learning how to apply these practices effectively to their business. Thirdly, SMEs can leverage informal control measures as a competitive advantage. The informality of these measures grants SMEs flexibility and swift responsiveness, a characteristic not typically found in larger enterprises. Fourthly, SMEs should formulate strategies aligned with their organisation's sustainable development goals. It is important to recognise that SMEs differ significantly from large-scale enterprises and require tailored approaches. Fifthly, SMEs should actively engage in socio-professional organisations to exchange knowledge with peers in the same industry. Additionally, they should strengthen collaborations with universities and vocational education institutions to tap into external resources for innovation purposes.

The study provides several recommendations to enhance policies related to innovation and creativity as follows. Firstly, the government should enact practical policies to oversee and guide the advancement of science and technology for SMEs in Vietnam. Establishing a technology market would enable SMEs to readily access and acquire new knowledge, ultimately leading to improved innovation outcomes. Secondly, the government should boost investments in education and training to cultivate a skilled and knowledgeable workforce proficient in new technologies. Thirdly, the government can institute programs aimed at fostering collaboration among SMEs, agents, and suppliers to enhance the added value of their products and services.

This study has some limitations. Firstly, the authors opted for convenience sampling, which is a non-probability sampling method where elements for the research sample are chosen conveniently. Future studies should consider using random

sampling methods to enhance the accuracy and reliability of the research findings. Secondly, this study solely assessed the impact of each independent knowledge management process on the innovation outcomes of enterprises, without addressing the influence of knowledge management on other organisational outputs such as business performance. From the results of this study, subsequent studies can address other organisational outputs.

CRediT author statement

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COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

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