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Smart Farmers' Knowledge-Oriented Leadership and Innovation Performance: The Mediating Role of Knowledge Management, Business Competency, and Innovation Culture for Agritourism

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Abstract

This study focuses on the role of smart farmers in applying what they learned to develop careers and agritourism business in the localities and investigates the relationship between knowledge-oriented leadership and knowledge management on business competency, innovation culture, and innovation performance. This study gathers data from smart farmers in the Thailand's educational system who had studied from higher education courses, used their knowledge to develop agritourism, and their communities. The data is collected from 413 smart farmers in each community who attend agritourism. The results from structural equation model (SEM) using AMOS reveals that knowledge-oriented leadership is correlated with knowledge management and innovation performance. Knowledge management is a mediating variable that had a correlation with business competency and innovation culture. While, business competency was not correlated with innovation performance. This likely indicates that smart farmers lacked the knowledge essential to integrating business practices into innovation development. It shows the wide range of knowledge-oriented leadership to solve community problems and explore factors that support agritourism business and innovation goals. The study can prove the relationship of Thai smart farmers with knowledge-oriented leadership to success factors and scarcity variables that require to develop in the future.

Keywords: knowledge-oriented leadership, knowledge management, business competency, innovation, smart farmer, agritourism, Thailand.

1. Introduction

For agritourism, it is an integrated activity between agricultural process and tourism management by using farmers' knowledge and abilities. As a result, the sustainability of agricultural work is associated with the competency of farmers (Jafari, Akhavan, & Nikookar, 2013; Tehseen, Ahmed, Qureshi, Uddin, & Ramayah, 2019). Agriculture is the main occupation in Thailand because the country has suitable land for farming, and it is supported by the government and the private sector. Educational institutions play a role in managing community knowledge and providing training that enhances agricultural and hospitality competency (Liang, Hsiao, Chen, & Lin, 2021). In response to the national policy, smart farmer development was initiated to integrate business knowledge (Rehman, Elrehail, Nair, Bhatti, & Taamneh, 2021), innovation(Dabić, Lažnjak, Smallbone, & Švarc, 2019), and technology (Gui, Lei, & Le, 2022) into agritourism or livestock husbandry. The main objective is to improve the quality of life and agricultural hospitality for farmers in local communities. The educational sector has supported farmers in obtaining higher education in order to increase the efficiency of agricultural personnel. The Agricultural Research Development Agency (Public Organization) provides financial support to farmers who enroll in universities through the lifelong learning system so that they can enhance their tourism or service knowledge and career capacity.

The motivation for researching this field is to offer theoretical direction and a foundation for enhancing knowledge oriented-leadership for smart farmer. The knowledge-oriented leadership can effectively convey the meaning of conventional leadership. The study will apply the influencing variables of leadership, the knowledge management operation mechanism to business competency, and the development of innovation culture to explain the outcome of innovation performance that identifies social cognitive leaders in the community. It may be useful for teaching leaders' behavior principles and drive agritourism enterprises for their communities with fully effectiveness.

The significant of this study was analyze the role of leaders' positive on knowledge state in the influence to business practice and innovation purpose. The study can guide leaders in community to find out the most effective to improve members' competency and to provide a basis for the improvement of their innovation outcomes, as well as the development of human capital with knowledge management. This will guide smart farmer to identify the important knowledge to lead approaches to improve leaders and member in communities by education system. The concept of concepts is pay attention to human-based resources and create value and an occupational future for human capital in local communities (Caprio, Wiltshier, & Corte, 2018) which bring to community development by intellectual properties. The smart farmer concept should be explored to create competency goals and identify the knowledge required for more effective integration and development. The study links the role of knowledge-oriented leadership to knowledge management, business competency, and innovation culture for smart farmers who can

adjust their understanding of community tourism markets and use innovative and commercial insights to boost their competitiveness, rather than focusing solely on community learning. Communities should be encouraged to share knowledge in order to generate future community-based income that contributes to the global economy (Lin & Beyerlein, 2006).

The usefulness for development for smart farmers must consider the differences in service characteristics, geographical conditions, and processing procedures. The management of leaders by knowledge management, competencies or innovation concept will be effectively improved, which will benefit the community's development and the implementation of relevant policies for develop members. It is significant for the high-quality development of agritourism. Linking the development of smart farmers with the lifelong learning system is helpful. There are a variety of subjects available for learners, so they can choose and combine subjects they are interested in to form new knowledge for productivity maximization. Smart farmers must be able to integrate knowledge from multiple disciplines. The Ministry of Agriculture states that new generations of farmers, smart farmers or not, must update their skills and knowledge to achieve agricultural sustainability including the service sector that is becoming popular in the development of agricultural resources for both national and international tourists. What farmers must have in order to operate their business is a sense of farm entrepreneurship together with the ability to manage agritourism communities, leading to rural economic development (Carter, 1998; Liang et al., 2021).

The implication of study can establish on community learning to design knowledge and competency for the smart farmer learning requires a diverse group of instructors because they learn different competencies and skills. Instructors need to be as flexible as learners. The design of the course must therefore be different from normal learning, taking into account the active learning, which is to learn in communities, together with personnel who have knowledge of that subject. Therefore, instructors must have adapted to keep up with the teaching style for achievements of learners through the cooperation of internal personnel, including either executives or instructors(Tan, 2012). The promoting good learning and cultivating culture is a daily knowledge development in order to pass on individualized knowledge to members of the instructor and support network until becoming a culture that is similar to a source of learning that will spread throughout the community of practitioners (Huysman, 2000). Knowledge-oriented leadership contribute to leaders who learn to understand the nature of their followers in society, have a clear leading direction, and communicate with their followers in an effective manner so that they can promote knowledge sharing throughout the community (Raudeliuniene & Kordab, 2019). Innovation culture shapes the environment of a community, including its values, beliefs, practices, and systems with innovation concept to performance in livelihood of smart farmer. Knowledge management can drive community culture based on the community's context. However, without knowledge management principles, it is difficult for those

leaders to transfer knowledge to community members. This learning culture is about confronting problems and building cooperation among all sectors.

The structure of this study has the detail of literature review in conceptual framework, explain the relationship on hypothesis development, follow with statistic process and measurement items on methodology, and give a reason from results with rational discussion. Then suggestion and implication are in the final part. The research purpose is based on the concept of smart farmer that involve the sustainable success of agritourism management depends on not only management practices but also the clarity of objectives associated with unique competencies in Thai agriculture, community-based tourism, and community development, including an integration of agricultural management with human resource development and the utilization of commercial management strategies. Experts in various sciences must collaborate in the development of a consistent competency framework to ensure the limitless capacity of future farmers.

2. Conceptual Framework and Hypotheses Development

2.1 Knowledge-Oriented Leadership on Knowledge Management Process and Innovation Performance for Smart Farmer

Knowledge-oriented leadership is mostly associated with knowledge management. Many organizations have shifted their focus toward building competitive advantages through the development of human resources' capacity and creating intellectual properties that are valuable and difficult to imitate. Donate and Sanchez de Pablo (2014) stated knowledge-oriented leadership prioritizes knowledge and uses intellectual skills to solve problems in the community. This leadership is required to manage knowledge in response to changing circumstances because, currently, each communities wants to create innovations to increase their performance. Knowledge-oriented leadership is defined as a leader's attitude or action that motivates the creation, sharing, and utilization of knowledge in a way that creates a shift in thinking and a series of productive outcomes (Naqshbandi & Jasimuddin, 2018).

It is useful in developing internal personnel to be result-oriented and training community members to adapt to changes. The key to success is the harmony of community and knowledge management (Shamim, Cang, & Yu, 2019). The concept of leader may relate with innovation performance, the applied for most of Thailand's smart farmers prefer to use innovation to apply for farm system. Holistic knowledge of the use of innovation has a similar point to the development of conventional agriculture in Thailand. Data has never been collected to serve as a study model for the next season's harvest. The change that improves the smart farmer's capabilities involves collecting data to apply to artificial intelligence (AI) and innovative techniques to predict what might happen. Reduce risks and cost structures that may have an impact Controlling innovation is also a part that requires knowledge management as a component (Huo, Malik, Ravana, Rahman, &

Ahmedy, 2024). Leaders' behavioral support creates knowledge atmosphere that facilitates the flow of work without using force and makes followers willing to contribute to the community's advancement. Therefore knowledge-oriented leadership must response on knowledge management practice that could be compatible for members, the process of knowledge should be path way for farming and agritourism achievement.

- H1: Knowledge-oriented leadership will be positively related to knowledge management of smart farmers.
- H2: Knowledge-oriented leadership will be positively related to innovation performance of smart farmers.

2.2 Relationship Between Knowledge Management Process and Business Competency

Knowledge management is a challenge in business competition, where a community's competitiveness is required. The goal of the knowledge management process is to efficiently and effectively bring the knowledge of individuals and the community together to build business success (Azan, Bootz, & Rolland, 2017). The process of knowledge management must be comprehensive and effectively respond to the needs of each related party. Knowledge management consists of the following procedures: identification, creation, collection, organizing, storage, dissemination, and application (Latif, Afzal, Saqib, Sahibzada, & Alam, 2021). Competency is a learned behavior influenced by dynamic knowledge elements. It is gained through learning or as a result of knowledge deterioration over time. Thus, competency stems from an individual's perspective on expanding or seeking knowledge (Shavelson, 2013). Business competency development in each community has a similar process but different goals. Smart farmers take charge of the financial outcomes that will increase farming's future growth and efficiency, they need to be knowledgeable about business management (Hanifah, Abdul Halim, Ahmad, & Vafaei-Zadeh, 2019). Knowledge management will communicate with the community to have business competency, profitability, and the ability to elevate business performance. It will promote the development or diversification of business units to complement the services that are Agritourism.

- H3: Knowledge management process will be positively related to business competency of smart farmer.

2.3 Relationship Between Knowledge Management Process and Innovation Culture

The link between innovation culture and entrepreneurship becomes important when business operators lack business skills, leading to a constant demand for innovation. A lack of intellectual property results in knowledge transitions. Social and cultural factors stimulate a radical change, contributing to the development of institutional culture and community unity (Dabić et al., 2019). The knowledge management process is to launch the knowledge for individual to integrate with necessary competency which is transferred through member's actions or experiences for their work. Knowledge management in community is different according to community objectives (Whelan & Carcary, 2011). The

smart farmer requires technology on their farm to develop productivity with their coworker. In terms of knowledge, people have to learn as a group and have similar motivations which support their work process. It can explain the reason that members gather to learn information technology devices. They have purposes to utilize all function of technology to develop their farm along with leaders and members

Technological dynamics create social phenomena that motivate each community or organization to develop innovation for competition. It can be said that the innovation process has evolved due to institutional context, as communities need innovation for business survival, and that innovation must be consistent with their social and cultural conditions and adaptive to an external environment in order to continuously obtain and transfer knowledge for community development and export synthesized knowledge to the society. Political factors based on the relationship between knowledge paths and resources, local wisdom, the development of new innovation management contexts, and the formation of new institutional development patterns together with community knowledge must be taken into account.

- H4: Knowledge management process will be positively related to innovation culture of smart farmer.

2.4 Relationship of Business Competency and Innovation Performance

Smart farmers in Thailand's education system must have key competencies to adapt to the globalization trend that focuses on innovation and network-based business and to integrate knowledge about product development, environmental stewardship, and social business. As a result, a set of courses that are in line with the Ministry of Agriculture's policy and business entrepreneurship learning should be established to develop the next generation of farmers who have the skills to operate their businesses in a sustainable way. Farm entrepreneurship, which places importance on leadership and business management abilities, is also vital for farmers to achieve business goals, lifelong employment, and rural economic development (Carter, 1998; McElwee, 2008). However, what should not be ignored is developing farmers or agritourism personnel to have competencies and knowledge on specific agricultural management activities, including off-farm labor supply, resource-based structural transformation, and decisions on market structure (Loughrey, Donnellan, Hanrahan, & Hennessy, 2013).

The link between technical innovation and business opportunities informs corporate strategy decisions. The inability to retain a durable competitive edge and the lack of internal resource capabilities are the key obstacles to the development of agricultural businesses (Kim & Jin, 2022). The concept of cutting-edge technologies is essential for the group of smart farmers. Policies for national development recognize the constraints faced by farmers. Thailand has prioritized advancing R&D and conducting business cycle. In terms of resource management, natural treatment, or farm management employing a system to

take care of it in order to achieve sustainable development, the desired outcomes are as follows. The smart farmer needs well-informed community leaders who strategize the right application of advances. Research and development that is customized for the local environment and improves operational outcomes from innovation culture.

- H5: Business competency will be positively related to innovation performance of smart farmers.

2.5 Relationship on Innovation Culture and Innovation Performance

Innovation culture is the integration of community culture and innovation knowledge. It brings together key elements of cultural assumptions focusing on behavior and environment to practically create and share community values, including common community strategies and goals, in an environment where the attitudes and ideas of each organizational member are not clear but aimed at community achievement and innovative results. The transfer of knowledge in each cultural circle differs according to the context of each community (Sheng & Sun, 2007). Innovation performance is motivated by goal setting, which places importance on organizational strengths and the promotion and development of an open working environment conducive to new knowledge formation. The difference in knowledge of human capital may contribute to organizational growth that leads to innovation performance (Chang, Sun, & Wu, 2022). Innovation knowledge must be practical and based on business competencies because saleable or usable quality is an indicator of success in business settings.

Innovation culture serves as a guideline for community members to seek innovation in order to achieve sustainable organizational performance and adapt to future changes. If a community wants to pursue innovation, there should be internal structure support and operational behavior improvement that are in line with market trends and development values, as well as an appropriate environment for the application of innovation (Al-Khatib, Al-Fawaeer, Alajlouni, & Rifai, 2022). Leaders in an innovation culture are required to engage in the establishment of innovative goals by using relevant knowledge elements to support the predetermined management policy.

- H6: Innovation culture will be positively related to innovation performance of smart farmers.

2.6 Hypothesis Development

The knowledge-oriented leadership providing guidance and direction to followers concerning the transfer of missions, visions, and goals; workplace culture; participatory decision-making; professional development; and community leadership practices (Boer, Deinert, Homan, & Voelpel, 2016; Weiherl & Masal, 2016). Knowledge transfer is one of the duties of leaders. Leaders must pay attention to community values and promote a good work environment and learning atmosphere in order to achieve synergies and better performance in business and innovation (Leithwood & Jantzi, 2005). In this study, the relationship on knowledge-oriented leadership have correlated to knowledge management

is used to address fundamental problems in local communities with insufficient adaptability to external social changes. This also include farm management by leaders requires careful planning and decision-making that will help encourage farmers to develop their conventional style into a new option to reduce production costs, which will help agriculture change in that the traditional labor force shift to intellectual properties of community. They will be experts on technology and information (Karunathilake, Le, Heo, Chung, & Mansoor, 2023). Therefore, there is a sequel to collecting data to enable deep learning from utilizing software such as artificial intelligence to avoid risks, increase productivity, and create long-term sustainability (H1 and H2).

Creating business competency and innovation performance is associated with the goal-oriented management approach. Interestingly, knowledge about innovation obtained from individuals can influence change in the community that they live in (Gui et al., 2022). Development tends to arise from the scarcity of knowledge and adaptation to change and causes community impacts. Knowledge must be seamlessly transferred from a community leader to community members. Thus, knowledge management plays a key role in this process. The transfer of knowledge starts with individuals sharing ideas and then accumulating knowledge through interpersonal interaction and communication, fulfilling knowledge needs (Crossan, Lane, & White, 1999). Every leadership style has a common link in that it is based on individuals' initiatives for community or social development. Business competency should include knowledge of current business procedures and external consumer needs in response to the effects of a transitional economy. Members of the community exchange knowledge, which leads to innovation performance. It blends personal expertise to produce a cutting-edge knowledge hub for society (H3).

A community that wants to succeed must be able to identify a work practice that meets success criteria. Knowledge is required to obtain appropriate resources to develop an innovation culture in the community (Gürlek, 2020). The innovation concept is important because it can respond to the government policy related to smart farmers. In order to survive, the community must have core values and sustainable competitive advantages. The environment that allows for the exchange of knowledge and experience fosters an open culture that brings individual expertise and knowledge together to create new things (Ode & Ayavoo, 2020). Knowledge management will adapt necessary innovation knowledge to settle fundamental that build the group of knowledge in community and build as the root of culture. Culture formation has a macro impact to give the sustain to innovation performance. This can discuss as the continue of relationship through innovation culture to innovation performance. The use of knowledge management will also contribute to cultural cultivation and innovation development (H4, H6).

Business competency deals with a variety of knowledge elements, including entrepreneurial skills, specific work knowledge, and knowledge related to the social environment. Skill training must start with the management system and leadership abilities

combined with relationship-building skills. To develop business competency, organizations must prioritize growth and sustainability over short-term success (Rehman et al., 2021). A lack of knowledge and training will make doing business in a fiercely competitive market more difficult. Since each community has different human capital, management principles must be used to reinforce knowledge investment aimed at community development or a shift in thinking paradigm. Those who are result-oriented and achieve business outcomes that exceed expectations are said to possess business competency (Mitchelmore & Rowley, 2010). Leaders play a key role in determining management style and practice. This research is in line with government policies that require farmers to have business ideas and innovation to respond to changes and competition in the market (H5).

The integration of leadership concepts in the educational system contributes to the creation of an agricultural development model that nearby communities can adhere to. Based on the above information in figure 1., research hypotheses and a conceptual framework were established;

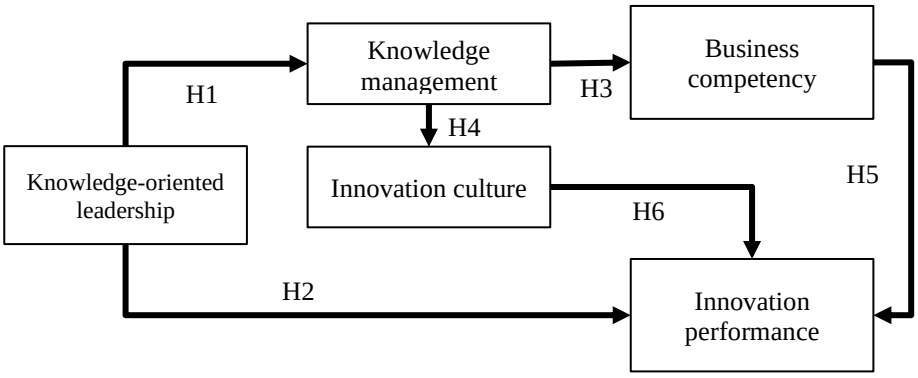

Figure 1. Conceptual Diagram of Hypothesized Relationship

3. Research Methodology

3.1 Population and Sample

A total of questionnaires was distributed to 413 smart farmers who received support to participate in the credit bank system. The data collection process took five months. The instrument was translated from English into Thai using the back-translation technique (Brislin, 1980). The target population was Thai smart farmers who met the selection criteria of the Ministry of Agriculture and could apply their knowledge and experience to improve agritourism efficiency and enhance community and environmental development. The participants took courses in the lifelong system certified by the Ministry of Higher Education, Science, Research, and Innovation to obtain agritourism and business

management knowledge. The participants had to be able to use and transfer their knowledge for community development at the local level, with the exception of those who ran private farming businesses. The participants were chosen using a purposive sampling with reason that smart farmers from criteria as mentioned. It specifies to people who work in agriculture and be community leaders. This is necessary to choose person that qualifications according to academic definition and the government description. Hypothesis testing was done using the statistical data obtained through a Likert-scale questionnaire. The data were analyzed using structural equation modeling (SEM) by the technique of Covariance-Based SEM (CB-SEM) because the analyst of structure must follow from fit indices such as CMIN/DF, RMSEA, CFI etc. The correlation between the manifest variable's should adjust between error term of manifest variable. Confirmatory factor analysis (CFA) was performed to find the factor loadings. Then the variables were adjusted before identifying the relationships between the variables. The minimum number of samples was limited based on the number of variables used in SEM. There were five latent variables. The number of samples was 60–120. However, the maximum likelihood estimation suggested a minimum sample size of not less than 200 for SEM analysis (Hair, Black, Babin, & Anderson, 2010).

3.2 Measure

The research instrument was a 7-point Likert scale questionnaire, consisting of five scales: knowledge-oriented leadership, knowledge management, business competency, innovation culture, and innovation performance scales ranged from 1 (strongly disagree) to 7 (strongly agree). Before conducting SEM, the instrument was tested using CFA. The CFA results showed that the factor loading was greater than 0.5 to confirmed sampling adequacy for factor analysis.

The knowledge-oriented leadership scale was adapted from a 5-point rating scale created by Naqshbandi and Jasimuddin (2018) to measure knowledge-oriented leadership among multinational technology companies in France. Their scale was developed based on the original scale by Donate and Sánchez de Pablo (2015). In this study, the knowledge-oriented leadership scale was used to measure the leadership behavior of smart farmers, who were educated on the development of agricultural products with innovative processes.

The knowledge management process scale was developed based on the original version by Latif et al. (2021), which measures knowledge management in seven dimensions. In this study, the scale was adapted to cover three knowledge management processes (knowledge creation, sharing, and application) and include content related to knowledge management in agricultural communities.

The business competency scale was adapted from the original scale by Kaur and Kaur (2022), with the idea that increasing business competency for farmers will improve their

ability to adapt to changing market situations and assist them in applying creativity in resource management.

The innovation culture scale was created based on the innovative organizational culture scale of Uzkurt, Kumar, Semih Kimzan, and Eminoğlu (2013), which was designed to measure how administrators make employees accept innovative organizational culture. The original questionnaire was developed by Ernest Chang and Lin (2007).

The innovation performance scale was adapted from the scale of Al-Khatib (2022), which focuses on governmental support that stimulates innovation culture in SMEs and motivates innovation performance in the aspect of product development. This is consistent with the role of smart farmers in transferring their innovation knowledge to agricultural communities for use in competing with external markets.

4. Data Analysis and Results

In this study, convergent validity was calculated using value weighting factors (factor loadings) derived from standardized regression weights, which resulted from confirmatory factor analysis. The weight of each variable should be at least 0.5. A Cronbach's alpha coefficient greater than 0.70 was used to assess the reliability (0.60 is acceptable in some cases) (Nunnally, 1967). The average variance extracted (AVE) should be higher than 0.5 (significant at ≥0.5) (Hair et al., 2010) or lower than 0.5 if the composite reliability (CR) exceeded 0.6 (Fornell & Larcker, 1981). The CR value should be above 0.7 (significant at ≥0.7) or reach a threshold level of 0.6. The results showed that the CR values ranged from 0.860 to 0.919, while the AVE values ranged between 0.607 and 0.700. All values came from the factor loading calculation as detailed in Table 1.

Table 1: Construct Validity

Variable	Loading	α	CR	AVE	Mean	SD
Knowledge-oriented leadership (KOL)						
Community leaders create an environment that influences participation behavior for members	0.772	0.914	0.915	0.645	6.052	0.933
Community leaders are knowledge guides with an open-minded that bring the successful to communities	0.676				5.934	1.030
Leaders learn from experience and accept mistakes for improve community performance.	0.728				5.798	1.129
Leaders presents behaviors that guide and supervise.	0.886				5.920	1.004
Leaders are willing to take knowledge from multiple sources for the benefit of the community	0.911				6.113	0.934
Leaders recognize or admire who applied knowledge into practice	0.819				5.991	1.055
Knowledge Creation (KM: KC)						
There should be a mechanism for creating knowledge and acquiring local wisdom from various sources	0.793	0.861	0.860	0.607	5.747	1.074
There are mentors or coaches to support the community	0.764				5.897	0.960
There should always be rewards for community members who offer new ideas or new knowledge	0.803				5.986	0.998
There should always be a mechanism that creates new knowledge from community wisdom.	0.756				5.934	0.998
Knowledge Storage (KM: KS)						
Knowledge storage and information used in community development should be easy to access	0.774	0.898	0.898	0.689	6.066	0.909
Adopted various technologies It will help to collect data in the community.	0.874				6.056	0.899
You can capture the essence of knowledge in communities to develop the community	0.864				6.122	0.908
Communities can help to prevent imitations from others	0.806				6.033	0.934
Knowledge Application (KM: AP)						
Your leaders encourage innovation and takes risks.	0.795	0.880	0.889	0.667	6.103	0.931

Variable	Loading	α	CR	AVE	Mean	SD
Your leaders are passionate about promoting growth and developing innovation for community's members.	0.826				5.859	1.149
Communities' leader has the vision and knowledge to help create educational opportunities.	0.870				5.826	1.100
Leaders were interested in differences and ready to cultivate innovation in employees.	0.772				6.046	0.951
Business competency (BC)						
Community members analyze alternatives and make decisions based on long-term outcomes	0.760	0.910	0.919	0.657	6.042	0.968
Community members can adapt multisectoral information	0.805				6.066	0.978
Community members can use data to solve problems	0.918				6.188	0.917
Community members support each other to achieve their goals	0.833				6.173	0.922
Community members know strengths and weaknesses in their community	0.736				5.939	1.137
Community members know how to access information to work towards their goals	0.799				5.953	1.031
Innovation Culture (IC)						
You were fostered innovation in your community	0.805	0.914	0.903	0.700	5.934	0.988
You have passionate about the development of innovations that are essential to the community	0.778				5.977	0.929
You can use knowledge to stimulate innovative learning in the community	0.843				5.986	0.924
You have the idea of creating challenges in your work to learn and growth	0.798				5.756	1.035
Innovation Performance (IP)						
Knowledge can improve the community with new ideas to enhance the products/services	0.751	0.898	0.881	0.650	5.934	0.988
Knowledge helps raise the innovation level in the community.	0.851				5.977	0.929
The community produces quickly because of the right knowledge	0.849				5.986	0.924
Developing business knowledge along with innovation encourages to improve community performance	0.890				5.756	1.035

Moreover, the internal consistency test was carried out, and the results showed a high level of consistency between the variables. In terms of the fitness index values, the Chi-square divided by the df value (CMIN/DF) was 1.834, which met the criteria that a Chi-square value of less than 5.00 and 3.00 indicates a very good fit (Hair et al., 2010). It was also found that AGFI = 0.932, IFI = 0.981, CFI = 0.981, GFI = 0.947, PNFI = 0.815, PCFI = 0.834, and RMSEA = 0.037. According to the criteria, AGFI, IFI, CFI, and GFI must be above 0.90. The parsimonious fit indices and RMSEA must be lower than 0.08 if the PNFI and PCFI values are close to 1.00. The findings revealed that all values passed the required standards.

The discriminant validity according to Fornell & Larcker Criterion has Hetrotrait-Monotrait index (HTMT) to consider for knowledge-oriented leadership and other variables (Table 2). The HTMT index of the construct was 0.955, which indicated a consistent model (Garson, 2016).

Table 2: Assessment of Heterotrait-Monotrait Ratio (HTMT)

No.	variable	KOL	KC	KS	KA	BC	IC	IP
1	Knowledge-oriented leadership (KOL)	-						
2	Knowledge Creation (KC)	0.73	-					
3	Knowledge Sharing (KS)	0.78	0.69	-				
4	Knowledge Application (KA)	0.88	0.72	0.82	-			
5	Business Competency (BC)	0.83	0.67	0.70	0.80	-		
6	Innovation Culture (IC)	0.70	0.68	0.65	0.71	0.70	-	
7	Innovation Performance (IP)	0.72	0.68	0.68	0.71	0.68	0.73	-

Construct validity was analyzed using the multitrait-multimethod technique. The data obtained from the questionnaire survey were used to analyze convergent validity. The square root of AVE was calculated and then compared to the variable correlation. According to Fornell & Larcker (1981), √AVE must be greater than the variable correlation to ensure appropriate discriminant validity. There are include both of maximum shared squared variance (MSV) and average shared squared variance (ASV) to test discriminant value which are MSV and ASV less than AVE, it means results were accepted.

Table 3: Assessment of discriminant validity (Fornell-Larker criterion)

	variable	$\sqrt{AVE}$	KOL	KC	KS	KA	BC	IC	IP
1	Knowledge-oriented leadership (KOL)	0.803	1						
2	Knowledge Creation (KC)	0.779	0.493	1					
3	Knowledge Sharing (KS)	0.831	0.526	0.41	1				
4	Knowledge Application (KA)	0.817	0.621	0.485	0.517	1			
5	Business Competency (BC)	0.811	0.613	0.478	0.51	0.609	1		
6	Innovation Culture (IC)	0.806	0.479	0.415	0.443	0.523	0.516	1	
7	Innovation Performance (IP)	0.837	0.591	0.491	0.561	0.615	0.572	0.561	1
	variable	**AVE**	**MSV**			**ASV**			
1	Knowledge-oriented leadership (KOL)	0.645	0.386			0.31			
2	Knowledge Creation (KC)	0.607	0.243			0.215			
3	Knowledge Sharing (KS)	0.69	0.315			0.247			
4	Knowledge Application (KA)	0.667	0.386			0.318			
5	Business Competency (BC)	0.657	0.376			0.305			
6	Innovation Culture (IC)	0.641	0.315			0.242			
7	Innovation Performance (IP)	0.677	0.378			0.321			

The structural equation analysis yielded the following results: CMIN/DF = 1.840, p-value = 0.000, GFI = 0.815, IFI = 0.939, CFI = 0.939, RMR = 0.048, PNFI = 0.793, PCFI = 0.850, and RMSEA = 0.060. All values achieved a good fit level, except for the good fit index, which was at a moderate level due to the large number of items and variables. Overall, the structural equation model was suitable. Thus, it could be said that the independent and mediating variables, comprising knowledge-oriented leadership, knowledge management, business competency, and innovation culture, in the structural equation model had a significant impact on innovation performance. The model fit well with theoretical models and was consistent with the empirical data. All values met the

criteria, indicating that the developed structural equation model provided a good fit to the data.

The research results revealed that knowledge-oriented leadership is significantly correlated with knowledge management in the same direction (β = 0.784, ***p < 0.001). As a result, Hypothesis H1 was accepted. Hypothesis 2 was also accepted because knowledge-oriented leadership is significantly correlated with innovation performance in the same direction (β = 1.252, ***p < 0.001). Furthermore, Hypothesis 3 was accepted since knowledge management is significantly correlated with business competency in the same direction (β = 1.382, ***p < 0.001). Hypothesis 4 was accepted, as knowledge management is significantly correlated with innovation culture in the same direction (β = 1.029, ***p < 0.001). Additionally, Hypothesis 6 was accepted because innovation culture is significantly correlated with innovation performance in the same direction (β = .420, ***p < 0.001). However, Hypothesis 5 was rejected since business competency is not correlated with innovation performance. The details are provided in Table 4.

Table 4: Hypotheses Testing

Hypotheses	Estimate (β)	S.E.	*t*-value	*p*-value	Result
H1: KOL -> KM	.784***	.076	10.263	.000	Supported
H2: KOL-> Inno. Per	1.252***	.347	3.610	.000	Supported
H3: KM -> Bus. Com	1.382***	.288	4.794	.000	Supported
H4: KM -> Inno. Cul.	1.029***	.122	8.467	.000	supported
H5: Bus. Com -> Inno. Per.	.578	.312	1.854	.064	Not supported
H6: Inno. Cul. -> Inno. Per.	.420***	.112	3.759	.000	supported

*p < 0.05, **p < 0.01, ***p < 0.001

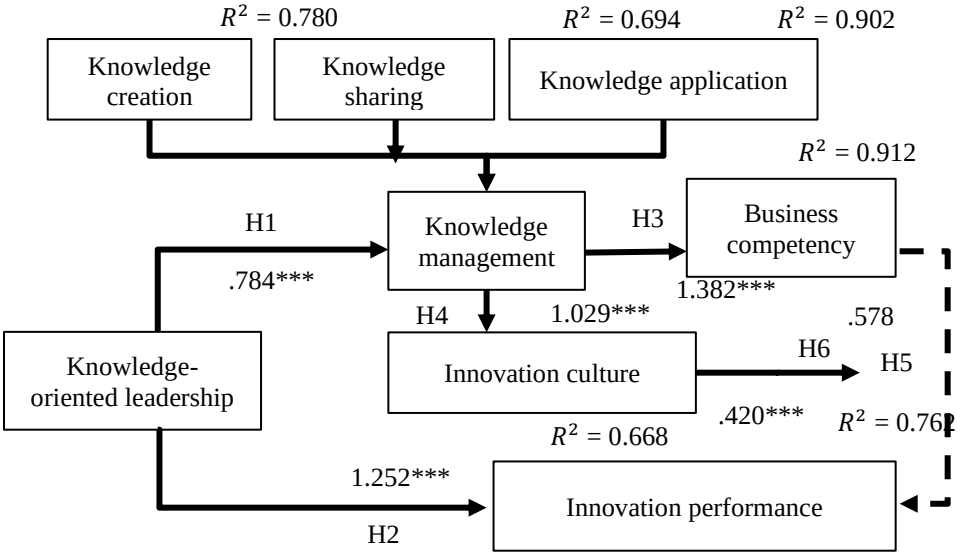

Figure 2: Path Coefficients of Hypotheses Testing

The estimate model obtained from the square multiple correlation analysis showed that the knowledge-oriented leadership model influences knowledge creation at 78.0 percent, knowledge sharing at 69.4 percent, and knowledge application at 90.2 percent. In addition, it influences business competency at 91.2 percent, innovation culture at .668 percent, and innovation performance at 76.2 percent. The findings indicated that this model can be used to predict green consumer behavior better than other variables (Figure 2). The path coefficient or standardized regression weight was 1.002 for the influence of knowledge-oriented leadership on knowledge management, 1.026 for the influence of knowledge-oriented leadership on innovation performance, 1.052 for the influence of knowledge management on business competency, 0.817 for the influence of knowledge management on innovation culture, and 0.339 for the influence of innovation culture on innovation performance. According to the results, all variables in this study have a significant causal correlation and can be used as independent variables in this study. The details about moderating effects are presented in Figure 2.

Knowledge-oriented leadership in term of smart farmer is the person who transform the traditional way of agricultural to supply chain evolution. The leader in community must have know-how on IOT system and integrated on data-driven farm management to sharing a knowledge to members in community (Spanaki, Karafili, and Despoudi, 2021). It builds on the leadership theories that takes into account followers' feelings and encourages knowledge sharing (Afsar, Badir, Saeed, & And Hafeez, 2017). The study of Adeagbo,

Bamire, Akinola, Adeagbo, Oluwole, Ojedokun, Ojo, Kassem, & Emenike (2023). clarify farmers in Southwest Nigeria required the knowledge of the climate change adaptation strategies to improve the pathway to manage their community. The reason is on the climate change which impact to their productivity and their members in livelihood still have original education to do farming. The concept of knowledge-oriented leadership is creating relationships among members in the community. The result confirms the effect from knowledge-oriented leadership to knowledge management that leaders transfer practical knowledge to their community members through a management model that emphasizes knowledge determination and a cooperative network which is linked with the external environment, community knowledge sharing, and social outcomes as part of social capital (Nahapiet & Ghoshal, 1998). The finding presented the effect of hypothesis H1, it provided the direct effect between knowledge-oriented leadership and knowledge management from smart farmer.

The role of a community leader can create engagement in their social networks by establishing community missions to create and apply the obtained knowledge within the community, creating a dynamic of collective work responsibilities, and fostering equal participation in agricultural society (Easter & Conway Dato-On, 2015). The development of community leader is part of knowledge-oriented leadership responsivity to provide the knowledge to members similar with sharing knowledge activity. The important knowledge was led to innovation, smart farmers have to invest on workforce to gain absorptive capacity. Leader's knowledge will attract to members and motivated them the new ideas for innovation to the growth of community. This linkage explained more than the relationship between knowledge-oriented leadership to innovation performance, it claimed open innovation concept can reform innovation performance to their progress in agritourism (Bashir & Pradhan, 2023). The initiation on innovation performance is generate from leaders, smart farmers can identify and assess the particularly value knowledge for their activities (Sahibzada, Janjua, Muavia, & Aamir, 2023). This links to the relationship between knowledge-oriented leadership and innovation performance which is a measure of community growth and survival because the ability of community leaders can stimulate innovation performance by setting goals (Pan, Song, Zhang, & Zhou, 2019). The purpose of smart farmers is supporting increased economic potential, influencing community activities in various processes, and increasing productivity from innovation integration. This verifies hypothesis H2 that certifies influence of knowledge-oriented leadership and innovation performance.

As a result of knowledge management and business competency were concerned with management strategies. The study explored the specific characteristics of knowledge management in each community. Individual competencies, business practices, and value-added resource utilization, and principles of applying knowledge to grow business should go in the same direction (Tehseen, Ahmed, Qureshi, Uddin, & T, 2019). The link between knowledge management and business competency is important for agritourism in the

community. It can create alignment of members to smarts farmer's business aim. The process of knowledge requires transforming all information and data to technology which congruence to learning activities and e-commerce (Abuezhayeh, Ruddock, and Shehabat, 2022). Knowledge on business management process will improve understanding from internal environment for learners and external environment to compete with rivalries and need for consumers. Hypothesis H3 can explain the above reason and impact from knowledge management to business competency of smart farmer.

Kim & Jim (2022) explain the manufacturing process is crucial to fostering innovation in smart farmers and creating smart farms, since it is an upstream development that demands expertise to raise the caliber of goods or services in South Korea. The community can use innovation to expand knowledge and turn it into intellectual assets that can combined to innovation performance in communities. By measuring the effects of applying innovation, research and development in both knowledge management and innovation management will improve workforce competency and increase productivity. The smart farmer's management style is led by a combination of knowledge and innovation, it suitable for small or medium-sized similar as agricultural communities were spread throughout all regions of Thailand. Compare to Gichuki, Osewe, and Ndiritu (2023) the need of faming productivity is received from climate change, the development goal is involved with training specific knowledge to manage with climate-smart agricultural (CSA) by integrated science and conservative farming in small-sized agricultural community. The knowledge supports the application CSA knowledge to organize agricultural system to prevent the situation from climate change. The process of creativity and innovation management arises because of relevant social processes and the communication of value prepositions through daily work or work systems (Dobni, 2008). The study explained the rational relationship between knowledge management and innovation culture that smart farmer motivated members to apply innovation to their work process which can prove hypothesis H4.

The smart farmer requires knowledge of technology and business that keeps up with globalization. These management problems have modern innovations to deal with small-scale farmers but using technology that large-scale agriculture uses. There may need to be education for farmers in the community and a large budget for investment. The problem of community is required highly develop by depends on funding in primary stage and direction to generate outcome between innovation performance or business knowledge diffusion. There will be a lack of confidence in the technology used because it is the infrastructure for resource management (Karunathilake, Le, Heo, Chung, & Mansoor, 2023). In addition, digital literacy is necessary for suburban management, linking with various technologies. These problems have caused smart farmers to receive support in Thailand from government agencies by encouraging farmers in each region to attend training to have knowledge in both business administration and technology separately. Each competency has individual competency results, depending on the specific objective. While determining competency indicators for smart farmers in higher education, it is important to consider what they lack in terms of management and pay attention to explore

their suitable innovation knowledge (Draganidis & Mentzas, 2006). This can suggest to smart farmer to train member in community in same direction for precise performance. It can explain, there no effect between business competency and innovation performance in hypothesis H5.

As a result of the relationship between the innovation culture and innovation performance, it will assist in comprehending how information is perceived and communicated in a way that advances agricultural development. In order to respond to collaboration in the farming community, the smart farmer is usually judged by their enhanced output. Despite the fact that agritourism requires both production and services. The community might have to give a clearer specific knowledge among their members (Huo, Malik, Ravana, Rahman, & Ahmedy, 2024). Innovation performance management must take into account for associated with the community's ability to improve their intellectual property, and human capital development. The indicators of innovation performance focus on benefits and activities related to innovation, including innovation-based knowledge development and the management of community culture that fosters innovation. The continuation of the performance depends on organizational elevation and adaptation to external conditions (Al-Khatib, 2022). Hypothesis H6 about the corelated result on innovation culture and innovation performance was accepted.

5. Discussion

Agritourism concepts should focus on a resource-based approach that places greatest emphasis on human capital in order to comprehend resource allocation and utilization necessary for achieving competitive advantages (Barney & Clark, 2007; Caprio, Wiltshier, & Corte, 2018), strategies for building human capital value in communities (Austin & Seitanidi, 2012), and future intellectual properties. The concept of community development, which is based on human capital, is like a lens that detects the details of the smallest unit in the community and centralizes all related activities. The principles of smart farmers and smart officers should be compared to determine competency goals and knowledge management practices that are required for work integration and development. According to the Committee to Impel the Smart Farmer Project and Smart Office, Ministry of Agriculture and Cooperatives (2013), smart farmers are those who know how to use information for commercialization, marketing, and creating awareness of the quality of agricultural products. The Ministry of Agriculture wants to incorporate the use of technologies and information systems into its policies, along with environmental development as a result of agritourism knowledge management.

Smart farming and community development require the integration of knowledge from various disciplines. Social science research has indicated that the link between competency and performance is knowledge management. Community-led entrepreneurs are required to have knowledge management competencies to logically support community performance outcomes (Shaabani, Ahmadi, & Yazdani, 2012). Knowledge management and competency development must be coordinated in the same direction in order for

entrepreneurs in the community to comprehend innovation development and be able to develop community culture toward better performance (Jafari et al., 2013). Community and human capital management must be consistent with determined strategies and community knowledge. Strategic community development should be active rather than passive. The center of people and business management should serve as a strategic architect who understands the roles and responsibilities of community members and determines mechanisms for development at the individual, community, and national levels.

Competency is associated with a wide range of human development practices and knowledge applications. It is linked to a human's life in terms of professional and social skills. When used with entrepreneurial skills, it increases the ability to enter the market and develop competitive products and services. People with entrepreneurship are likely to be leaders who have the knowledge and skills to develop organizational or community structure and to determine strategies for competitive decision-making or systematic operation (Talik et al., 2012). Entrepreneurial competency at the micro level should emphasize missions that connect entrepreneurial behavior to outcomes in ecosystem markets or problem-solving techniques. At the community level, it should focus on human capital management to enhance business productivity and efficiency. Overall, community leaders need to be capable in business decision-making, especially in the aspect of income, which is the community's input (Mustapha, Al Mamun, Mansori, & Balasubramaniam, 2020). This will lead to competency distribution, contributing to the establishment of self-managed communities in the long run.

Innovation culture and innovation performance are correlated because both are concerned with the thoughts, beliefs, and customs of community members, whether individuals or groups, that make up social culture and the use of modern technologies in the communities (Chen & Huang, 2009). Innovation management must prioritize both innovation and human management, including knowledge management, relationship management, and statistical pathway analysis to ensure the final outcome of supportive factors. However, this research found that business competency is not significantly correlated with innovation performance. This might be because the smart farmers in this study did not mainly work based on business principles but paid more attention to creating innovation. Byukusenge, Munene, and Orobia (2021) indicated that managerial competency is associated with innovation and business performance. Thai farmers continue to lack entrepreneurial skills, making starting a business a high-risk venture, and integrated their business to service industry. The association between management approaches and business competencies is vital to addressing economic issues. The smart farmers might have different needs in terms of a management approach that focuses on the duty of work, resulting in no correlation between those variables.

5.1 Management Implications

Knowledge-oriented leadership is considered the basis for leaders with knowledge process with adaptation to change requires knowledge input. The process of knowledge application

must have a stimulus. Leaders who participate in the credit bank system can choose to study what they lack and gain knowledge useful for enhancing the community's business potential and innovation principles. Competency development in the tourism community must integrate value creation, community focus and vision, modern farmers' commitment, and local ideas with the work of the community network based on the competency concept in order to lead community members to success. The implementation steps consist of the following: firstly, Knowledge-oriented leadership can improve the implementation of knowledge management practices in communities that prioritize innovation performance, especially those with a cooperative culture. It creates a community shared value that intangible assets, knowledge, or intellectual properties should be used to improve general agritourism processes by integrating scientific technologies to create sustainability. Second, encourage community members to place emphasis on visions determined based on national policies and management practices and how to accomplish them. This is because smart farming competencies can be obtained through the national framework for human capital development. Every farmer can achieve these competencies, even without certification, if the visions are properly communicated and passed down. Thirdly, motivate community members to commit to being modern farmers and participate in business strategy formation, knowledge creation, and knowledge sharing at the community level. Finally, develop creative ideas and innovations by supporting community members to have leadership skills for community development. It includes qualification of smart farmer in ability to evaluate and predict with information technology system such as IoT devices and conversion of results to participation in the community as a network. Leading to a culture of innovation in the community and operating results that come from innovation and increasing productivity through knowledge management and innovation performance. This will make community members love their community and be willing to use modern management competencies to contribute to community development according to national policies.

5.2 Theoretical Contribution

The finding seems like to applied the knowledge (intangible resource) to innovation performance (tangible resource). It can compare to resource based-view theory that is consumption of this study because agriculture depends on many sectors, including the private sector that depends on know-how and source of materials including the government sector that has policies and regulations. Knowledge management is necessary to generate value for the community and innovations that will lessen reliance on outside funding while fostering support on the community. The goal is reducing expenses from outsourcing or intermediary stakeholders which are an issue in Thailand. In order to increase independence from external dependency, improving capacity for business and innovation will enable one to operate independently and support the community by leveraging its human capital to raise standards of living in community. Resource based-view theory confirm the behavior for community member to utilized innovate in the different way, but

community members in an innovation culture are given the freedom and authority to create work and extract the core of their experiences through knowledge refinement. The difference in knowledge levels and the emergence of new knowledge that comes with the use of new resources can cause change. Fostering a culture of change is not an easy task. If community members work separately and follow their own goals, there will be no organizational unity. Thus, resource allocation must be carried out concurrently with creating awareness of innovation among all community members to set standards and enhance community business results which suitable for their value.

The success of farming can establish, if there are knowledge leaders and encouragement from government policies. They can support of smart farmer to launch their own businesses by reducing private exploitation that causes farmers into liabilities. Knowledge-oriented leadership receive concept from transformational leadership and transactional leadership which takes into account followers' feelings and encourages knowledge sharing and assists the community in working to standards and reduces work errors by creating awareness of the importance of knowledge utilization. Knowledge-oriented leadership is more effective at managing knowledge for community members because This reflects the integration of various leadership concepts in new generation of smart farmers that aimed to providing guidance and direction to followers concerning the transfer of missions, visions, and goals; community to crate innovation culture; participatory decision-making on business; and community distributed leadership practices to develop their agricultural identity

5.3 Limitations and Future Research Directions

Knowledge-oriented leadership combines transformational and transactional leadership elements with knowledge management, with the aim of using knowledge to lead community members. In other words, it aims to provide knowledge to community members so that they can understand relevant benefits. Its limitation is that community leaders must be truly knowledgeable.

According to the research results, competency and innovation are not correlated. In fact, business achievement is a success indicator for knowledge-based innovation development. Acceptance of innovation is required. Business strategies must not be overlooked. Business competency is necessary for the thinking process and is involved with other competencies, such as diversity management, change management, and technological acceptance.

Smart farmers participate in the credit bank system to develop lifelong learning abilities. However, there is still a weakness in terms of curriculum scope. The curriculum components may be too neutral. What smart farmers learn in the classroom may be far from their actual experiences in local communities, making it impossible to make use of the obtained knowledge in problem-solving. Adopting other forms of education, such as the dual education system, which allows students to work in industrial or agricultural industries, may assist in solving local problems. In some areas of Thailand, there is a higher education cooperation that encourages students to participate in community development, learn about local problems, and receive training and lessons on problem-solving.

The social enterprise concept should be used to explain the role of farmers in community development, from upstream to downstream activities, so that they can establish a business structure and enter the educational system at the same time. Social enterprises need collaboration from many stakeholders, including public and private agencies and business organizations, and require the integration of various knowledge covering business management, science, and community development to deal with diverse problems and future changes.

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REFERENCES

Abuezhayeh, S.W., Ruddock, L. & Shehabat, I. (2022), Integration between knowledge management and business process management and its impact on the decision making process in the construction sector: a case study of Jordan, *Construction Innovation*, 22(4), 987-1010.

Adeagbo, O.A., Bamire, A.S., Akinola, A.A., Adeagbo, A.D., Oluwole, T.S., Ojedokun, O.A., Ojo, T.O., Kassem, H.S., & Emenike, C.U. (2023). The level of adoption of multiple climate change adaptation strategies: Evidence from smallholder maize farmers in Southwest Nigeria, *Scientific African*, 22, e01971

Afsar, B., Badir, Y. F., Saeed, B. B., & And Hafeez, S. (2017). Transformational and transactional leadership and employee's entrepreneurial behavior in knoeledge-intensive industries. *The Internationa Journal of Human Resource Managment*, 28(2), 307-332.

Al-Khatib, A. W. (2022). Intellectual capital and innovation performance: the moderating role of big data analytics: evidence from the banking sector in Jordan. *EuroMed Journal of Business*, 17(3), 391-423.

Al-Khatib, A. W., Al-Fawaeer, M. A., Alajlouni, M. I., & Rifai, F. A. (2022). Conservative culture, innovative culture, and innovative performance: a multi-group analysis of the moderating role of the job type. *International Journal of Innovation Science*, 14(3/4), 675-692.

Austin, J. E., & Seitanidi, M. M. (2012). Collaborative Value Creation: A Review of Partnering Between Nonprofits and Businesses: Part I. Value Creation Spectrum and Collaboration Stages. *Nonprofit and Voluntary Sector Quarterly*, 41(5), 726-758.

Azan, W., Bootz, J.-P., & Rolland, O. (2017). Community of practices, knowledge transfer, and ERP project (ERPP). *Knowledge Management Research & Practice*, 15(2), 238-256.

Barney, J. B., & Clark, D. N. (2007). *Resource-Based Theory: Creating and Sustaining Competitive Advantage*. United State: Oxford University Press.

Bashir, M. & Pradhan, S. (2023), The influence of knowledge-oriented leadership on business model innovation and open innovation: mediating role of absorptive capacity, *Management Decision*, Vol. 22(1), 39-62

Boer, D., Deinert, A., Homan, A. C., & Voelpel, S. C. (2016). Revisiting the mediating role of leader–member exchange in transformational leadership: the differential impact model. *European Journal of Work and Organizational Psychology,* 25(6), 883-899.

Brislin, R. W. (1980). Translation and content analysis of oral and written material. In H. Triandis & J. Berry (Eds.), *Handbook of cross-cultural psychology: methodology*. Boston: Allyn and Bacon Publishers.

Byukusenge, E., Munene, J. C., & Orobia, L. A. (2021). Managerial competencies and business performance: innovation as a mediator in Rwandan SMEs. *International Journal of Law and Management,* 63(5), 445-463.

Caprio, V. D., Wiltshier, P., & Corte, V. D. (2018). The Development of the Agritourism Sector in Campania, Italy. In M. A. Camilleri (Ed.), *The Branding of Tourist Destinations: Theoretical and Empirical Insights* (pp. 83-95): Emerald Publishing Limited.

Carter, S. (1998). The economic potential of portfolio entrepreneurship: Enterprise and employment contributions of multiple business ownership. *Journal of Small Business and Enterprise Development,* 5(4), 297-306.

Chang, P.-C., Sun, K., & Wu, T. (2022). A study on the mechanisms of strengths-based psychological climate on employee innovation performance: a moderated mediation model. *Chinese Management Studies,* 16(2), 422-445.

Chen, C. J., & Huang, J. W. (2009). Strategic human resource practices and innovation performance — The mediating role of knowledge management capacity. *Journal of Business Research,* 62(1), 104-114.

Crossan, M. M., Lane, H. W., & White, R. E. (1999). An Organizational Learning Framework: From Intuition to Institution. *The Academy of Management Review,* 24(3), 522-537.

Dabić, M., Lažnjak, J., Smallbone, D., & Švarc, J. (2019). Intellectual capital, organisational climate, innovation culture, and SME performance. *Journal of Small Business and Enterprise Development,* 26(4), 522-544.

Dobni, C. B. (2008). Measuring innovation culture in organizations. *European Journal of Innovation Management,* 11(4), 539-559.

Donate, M., & Sanchez de Pablo, J. D. (2014). The role of knowledge-oriented leadership in knowledge management practices and innovation. *Journal of Business Research,* 68(2), 360-370

Draganidis, F., & Mentzas, G. (2006). Competency based management: a review of systems and approaches. *Information Management & Computer Security,* 14(1), 51-64.

Easter, S., & Conway Dato-On, M. (2015). Bridging Ties Across Contexts to Scale Social Value: The Case of a Vietnamese Social Enterprise. *Journal of Social Entrepreneurship*, 6(3), 320-351.

Ernest Chang, S., & Lin, C. S. (2007). Exploring organizational culture for information security management. *Industrial Management & Data Systems,* 107(3), 438-458.

Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. Journal of Marketing Research, 18, 382-388.

Garson, G.D. (2016) Partial Least Squares: Regression and Structural Equation Models. Statistical Associates Publishers, Asheboro.

Gichuki, C., Osewe, M. and Ndiritu, S.W. (2023), Dissemination of climate smart agricultural knowledge through farmer field schools (FFS): analyzing the application CAS knowledge by smallholder farmers, *International Journal of Development Issues*, 22(3), 399-417.

Gui, L., Lei, H., & Le, P. B. (2022). Fostering product and process innovation through transformational leadership and knowledge management capability: the moderating role of innovation culture. *European Journal of Innovation Management,* 25(5), 1221-1241.

Gürlek, M. (2020). Knowledge Centered Organizational Culture – Innovation Performance Model *Tech Development through HRM* (pp. 63-74): Emerald Publishing Limited.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis*. New York.: Pearson Publishers.

Hanifah, H., Abdul Halim, H., Ahmad, N. H., & Vafaei-Zadeh, A. (2019). Emanating the key factors of innovation performance: leveraging on the innovation culture among SMEs in Malaysia. *Journal of Asia Business Studies,* 13(4), 559-587.

Huo, D., Malik, A. W., Ravana, S. D., Rahman, A. U., & Ahmedy, I. (2024). Mapping smart farming: Addressing agricultural challenges in data-driven era. *Renewable and Sustainable Energy Reviews*, 189(2024), 113858.

Huysman, M. (2000). An organizational learning approach to the learning organization. *European Journal of Work and Organizational Psychology*, 9(2), 133-145.

Jafari, M., Akhavan, P., & Nikookar, M. (2013). Personal knowledge management and organization's competency: A service organization case study. *Education*, 6(3/4), 181-194

Karunathilake, E. M. B. M., Le, A. T., Heo, S., Chung, Y. S., & Mansoor, S. (2023). The path to smart farming: Innovations and opportunities in precision agriculture. *Agriculture*, 13(8), 1593.

Kaur, S., & Kaur, G. (2022). Human resource practices, employee competencies and firm performance: a 2-1-2 multilevel mediational analysis. *Personnel Review,* 51(3), 1100-1119.

Kim, D., & Jin, S. (2022). Innovation capabilities and business performance in the smart farm sector of South Korea. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), 204.

Latif, K. F., Afzal, O., Saqib, A., Sahibzada, U. F., & Alam, W. (2021). Direct and configurational paths of knowledge-oriented leadership, entrepreneurial orientation, and knowledge management processes to project success. *Journal of Intellectual Capital*, 22(1), 149-170.

Leithwood, K., & Jantzi, D. (2005). A Review of Transformational School Leadership Research 1996–2005. *Leadership and Policy in Schools*, 4(3), 177-199.

Liang, A. R.-D., Hsiao, T.-Y., Chen, D.-J., & Lin, J.-H. (2021). Agritourism: experience design, activities, and revisit intention. *Tourism Review*, 76(5), 1181-1196.

Lin, Y. & Beyerlein, M. (2006). Communities of Practice: A Critical Perspective on Collaboration. Advances in Interdisciplinary Studies of Work Teams. 12. 53-79.

Loughrey, J., Donnellan, T., Hanrahan, K. F., & Hennessy, T. (2013). Agricultural Labour Market Flexibility in the EU and Candidate Countries: Presentation. *Factor Markets*, 49, 1-35

McElwee, G. (2008). A taxonomy of entrepreneurial farmers. *International Journal of Entrepreneurship and Small Business*, 6(3). 465-478.

Mitchelmore, S., & Rowley, J. (2010). Entrepreneurial Competencies: A Literature Review and Development Agenda. International Journal of Entrepreneurial Behavior & Research, 16, 92-111.

Mustapha, W. N. W., Al Mamun, A., Mansori, S., & Balasubramaniam, S. (2020). Effect of entrepreneurial competencies on micro-enterprises income and assets in Malaysia. *Asia Pacific Journal of Innovation and Entrepreneurship*, 14(3), 249-261.

Nahapiet, J., & Ghoshal, S. (1998). Social Capital, Intellectual Capital, and the Organizational Advantage. *The Academy of Management Review*, 23(2), 242-266.

Naqshbandi, M. M., & Jasimuddin, S. M. (2018). Knowledge-oriented leadership and open innovation: Role of knowledge management capability in France-based multinationals. *International Business Review*, 27(3), 701-713.

Ode, E., & Ayavoo, R. (2020). The mediating role of knowledge application in the relationship between knowledge management practices and firm innovation. *Journal of Innovation & Knowledge*, 5(3), 210-218.

Pan, X., Song, M. L., Zhang, J., & Zhou, G. (2019). Innovation network, technological learning and innovation performance of high-tech cluster enterprises. *Journal of Knowledge Management*, 23(9), 1729-1746.

Raudeliuniene, J., & Kordab, M. (2019). Impact of Knowledge Oriented Leadership On Knowledge Management Processes in the Middle Eastern Audit and Consulting Companies. *Business, Management and Education*, 17, 248-268.

Rehman, S. U., Elrehail, H., Nair, K., Bhatti, A., & Taamneh, A. M. (2021). MCS package and entrepreneurial competency influence on business performance: the moderating role of business strategy. *European Journal of Management and Business Economics,* 32(1), 1-23.

Sahibzada, U.F., Janjua, N.A., Muavia, M. and Aamir, S. (2023). Knowledge-oriented leadership and organizational performance: modelling the mediating role of service innovation, knowledge sharing quality. *Journal of Organizational Effectiveness: People and Performance, Article publication date: 9 June 2023, Ahead of Print.*

Shaabani, E., Ahmadi, H., & Yazdani, H. R. (2012). Do interactions among elements of knowledge management lead to acquiring core competencies. *Business Strategy Series,* 13, 307-322.

Shamim, S., Cang, S., & Yu, H. (2019). Impact of knowledge oriented leadership on knowledge management behaviour through employee work attitudes. *The International Journal of Human Resource Management,* 30(16), 2387-2417.

Shavelson, R. J. (2013). On an Approach to Testing and Modeling Competence. *Educational Psychologist,* 48(2), 73-86.

Sheng, X., & Sun, L. (2007). Developing knowledge innovation culture of libraries. *Library Management,* 28(1/2), 36-52.

Spanaki, K., Karafili, E. and Despoudi, S. (2021), AI applications of data sharing in agriculture 4.0: a framework for role-based data access control, *International Journal of Information Management,* Vol. 59, 102350

Talik, E., Laguna, M., Wawrzeńczyk-Kulik, M., Talik, W., Wiacek, G., Vingoe, G., & Huyghe, P. (2012). The Astra-Manager Tool: A Method of Measuring Competencies of Micro Firm's Managers. *Human Resource Management Research,* 2, 9-14.

Tan, C. Y. (2012). Instructional leadership: toward a contextualised knowledge creation model. *School Leadership & Management,* 32(2), 183-194.

Tehseen, S., Ahmed, F. U., Qureshi, Z. H., Uddin, M. J., & Ramayah, T. (2019). Entrepreneurial competencies and SMEs' growth: the mediating role of network competence. *Asia-Pacific Journal of Business Administration,* 11(1), 2-29.

Uzkurt, C., Kumar, R., Semih Kimzan, H., & Eminoğlu, G. (2013). Role of innovation in the relationship between organizational culture and firm performance. *European Journal of Innovation Management,* 16(1), 92-117.

Weiherl, J., & Masal, D. (2016). Transformational Leadership and Followers' Commitment to Mission Changes. *International Journal of Public Administration,* 39(11), 861-871.

Whelan, E., & Carcary, M. (2011). Integrating talent and knowledge management: where are the benefits? *Journal of Knowledge Management,* 15(4), 675-687.