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LEADERSHIP, KNOWLEDGE MANAGEMENT AND ORGANIZATIONAL BEHAVIOR AS DETERMINANTS OF INNOVATION CAPABILITY IN FOOD MANUFACTURING COMPANIES

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Abstract:
The aim of this research study was to establish the determinants of innovation capability among food manufacturing companies by determining the most suitable Structural Equation Model that accurately represented the relationship between leadership, knowledge management, organizational behavior and innovation capability based on the gathered data. This study contributes towards achieving several United Nations Sustainable Development Goals, including SDG Two – zero hunger; SDG Three – good health and well-being; and SDG Nine – build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Adapted standardized survey questionnaires published in scholarly journals were utilized as primary data-gathering instruments. Four hundred seven respondents from thirty-three different food manufacturing companies were selected as respondents for this study. The research style used was descriptive-correlational, and a stratified-random selection approach was used to ensure more precise results. Statistical methods, including mean, Pearson Product Moment Correlation and Structural Equation Modeling, were used to examine the levels, relationships, effects, and optimal modeling. Results showed that leadership, knowledge management, organizational behavior, and innovation capability obtained a very high level of mean scores. The best-fit structural equation model results indicate a significant correlation between leadership and knowledge management towards innovation capability among food manufacturing companies. Leadership, knowledge management and organizational behavior are significantly related to innovation capability. Further, out of the three exogenous variables, leadership and knowledge management significantly influence innovation capability among food manufacturing companies in Southern Philippines. Model one is the best-fit model out of the six investigated structural models.

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1. Introduction

Business organizations are forced to contend with a wide variety of challenges and obstacles as a result of the rapid pace of technological advancement, shifting consumer preferences, and growing global economic integration (Khassawneh *et al.*, 2022; Castaneda and Cuellar, 2020). Emerging as one of the important topics that practitioners and decision-makers are becoming increasingly interested in, enhancing organizational innovation capacity is becoming an important research agenda among academic scholars (Iqbal *et al.*, 2021; Bashir and Farooq, 2019; Ganguly *et al.*, 2019).Innovation capability of a specific organization is often recognized as an essential factor in securing a competitive advantage for a company and ensuring the firm's continued success (Hwang *et al.*, 2020). Therefore, a great number of business organizations make a tremendous effort to craft and formulate necessary strategies to effectively innovate, even though they continue to be mimics and have difficulty transitioning into innovators themselves (Acosta-Prado, 2020; Lei *et al.*, 2019a). The determination of the strategic elements that greatly boost the organization's innovation capability becomes an increasingly relevant and very required endeavor nowadays.

Innovation is one of the key drivers of a country's economic expansion, which is also critical in terms of industry and organizational level competitiveness (Tung *et al.*, 2021). An organization's capacity to prototype new products, services, labor practices, and management processes and the purpose of obtaining a competitive advantage over other organizations is referred as innovation capability (Le *et al.*, 2021).

Existing academic research studies in the food innovation index frequently emphasis on particular disciplines of the food industry, such as agriculture (Antonelli *et al.*, 2022), manufacturing and processing (DeMaria and Zezza, 2020), retail (Albors-Garrigos, 2020), academia (Knickel *et al.*, 2021), products or technologies (Stangierska *et al.*, 2022; Schwindenhammer and Gonglach, 2021; Grimsby and Kure, 2019). Previous studies related to the food innovation index focus on a variety of views, including those of the customer (Albertsen *et al.*, 2020), governments or regions (Luo *et al.*, 2020; Sartison and Artmann, 2020).

A huge and diverse body of relevant academic research affects the food innovation index among various countries, which is influenced by a sophisticated system that calls for a more holistic perspective (Galanakis, 2021). Although numerous reports concentrate on these many regions and complications, it does not seem that there is a focus that looks at both extremes of the food spectrum.

The food industry is renowned for being generally slow-growing, mature, and conservative as a corporate industry; hence, it is necessary for the different food manufacturing industry stakeholders to have a deeper understanding of innovation capability, which may stimulate greater cooperation within the entire food industry.

Everyone is up against comparable obstacles. For instance, the impact of global climate change and the difficulties posed to the global economy by dramatic and unanticipated fluctuations in market conditions (Borowksi, 2021).

The EIU Global Food Innovation Index (GFII) aims to provide a "*consistent and robust systematic approach*" to quantifying and differentiating various factors relevant to food innovation capabilities across 113 nations (GFII, 2022), as presented in Table 1. The GFII algorithm utilizes around 19 variables to compute scores.

This index draws on previous studies, such as the Global Hunger Index (Allee *et al.*, 2021) and the State of Food Insecurity (WHO, 2021). The criteria used in this study are arranged into four categories: innovation, quality, availability, safety and affordability. As presented in Table 1, the competitiveness of the Philippine food manufacturing industry has been left behind in comparison with its neighboring countries in the ASEAN region in terms of food innovation, leading to food security and availability. As a result, it is therefore imperative for the Philippine food manufacturing sector to enhance its innovation capability to improve its standing in the global food innovation index.

Enhancing the innovation capability of the food manufacturing sector can make significant strides towards achieving several United Nation Sustainable Development Goals (UN SDGs) including SDG 2 – Zero Hunger through innovation in food processing and product development can lead to the creation of nutrient-dense foods, addressing malnutrition and promoting health. It also contributes to SDG 3 – Good Health and Well-Being by developing healthier food options and ingredients, which can contribute to preventing diet-related diseases and promoting overall well-being.

Table 1: Global Food Innovation Index (GFII, 2022)

Rank	Country	Index Score
19	Singapore	75.7
43	Malaysia	67.9
51	Thailand	64.0
63	Vietnam	60.3
65	Indonesia	59.5
70	Myanmar	56.6
74	Philippines	55.7
81	Cambodia	51.5
90	Laos PDR	46.4
Not ranked	Brunei Darussalam	No score

Improving the innovation capability of food manufacturing companies contributes to SDG 9 - build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation that will integrate an innovative mindset within its organizational culture. Furthermore, this study supports SDG 17 – Partnership for the Goals, which recommends collaborative innovation, encouraging collaboration between governments, the private sector, academia and civil society to promote innovation in the food industry wherein public-private partnerships can facilitate the sharing of resources, knowledge and expertise to achieve common goals (The United Nations, 2015).

2. Literature Review

Various studies have shown the connection and relationship between the variables used in this study. First, an organization's leadership approach is one of the most important facets in establishing whether a company will attain a sustainable competitive advantage and remain relevant in the marketplace wherein it operates (Muttar *et al.*, 2021). Leadership style can be defined as an influence of interaction between a leader and their subordinates that results in the attainment of a common organizational goal (Al Amiri *et al.*, 2020). Existing academic studies provided by the previous research elucidate various facets of leadership that have garnered widespread consensus among members of the academe and industry practitioners.

Previous research studies suggest that leaders and the leadership characteristics they exhibit are likely the single most critical factor in fostering innovative capabilities inside a company (Tung, 2021; Lasrado *et al.*, 2021; Le, 2020; Lei *et al.*, 2019). Fostering openness among employees, which catapults effective knowledge management, inspiring and motivating staff's creative juices, and intellectual stimulation are all ways that leadership may positively engage a firm's capacity for innovation (Khassawneh *et al.*, 2022).

Current academic literature's understanding of the direct connection that exists between leadership and innovation capability is limited and immature. In the correlation between leadership and innovation capabilities, there are still theoretical and empirical gaps, especially in low-tech sectors such as the food manufacturing industry, which calls for more inquiries. In order to close these gaps, further investigation is required (Lei *et al.*, 2019b).

Leadership actions and qualities significantly impact the degree to which organizational knowledge management mechanisms are encouraged or constrained (Yin *et al.*, 2020b). Leadership support and encouragement are both necessary components in developing and preserving a constructive knowledge management environment among an organization's employees (Li *et al.*, 2020).

Existing academic literature suggests that effective leadership results in the creation of a positive working atmosphere and the provision of enough resources, both of which make it easier for workers to engage in activities related to knowledge management (Udin and Shaikh, 2022; Swanson *et al.*, 2020; Roque-Lopez *et al.* 2019). Employees are positively motivated to engage in conversation with one another and share their knowledge when transformational leaders possess attributes such as inspirational motivation, intellectual stimulation and charm (Asbari, 2020; Eliyana and Ma'arif, 2019). In a manner analogous to this, Naeem *et al.* (2021) suggested that the aspects of effective leadership are ideally suited for knowledge management. When there is strong leadership in place in an organization, it tends to generate an atmosphere in which employees are more likely to be innovative and more eager to impart their own knowledge capital to their colleagues in the workplace.

According to the findings of the study conducted by Purwanto (2020), leadership places a significant amount of emphasis on developing a culture that is both educated and supportive in order to mold and encourage positive employee performance toward knowledge sharing with other employees. Hoang *et al.* (2021) stipulate that leadership is a vital aspect in the advancement of a constructive environment for knowledge management because it places an emphasis on fostering the intellectual capital of employees, providing people with a sense of direction and goal, as well as garnering the respect and confidence of employees.

Leadership has both an implicit and explicit impact on the perception that employees have about knowledge management because of the good impact it has on distributive justice and the confidence that employees give to their organizational leaders (Lei *et al.*, 2019a). Transactional leadership style may not be influential or maybe less productive when it comes to engaging workers to participate in the knowledge management process and activities, which an innovative culture is highly essential (Abbas and Ali, 2023).

Leadership characteristics is one of the most significant operational components for businesses to compete in the marketplace and acquire long-term benefits effectively. A persuasive connection between leaders and followers that leads to the accomplishment of their mutual goals is referred to as a leadership style (Puni *et al.*, 2022). The extensive body of relevant literature from various academic scholars and industry professionals provides numerous aspects of leadership.

Effective and inspiring leadership makes employees become motivated at work. As a result, it is conceivable for organizational workers to feel inspired while they are in the workplace. Positive organizational behavior encourages the provision of additional intellectual stimulation from leaders in the form of encouragement and assistance in resolving obstacles faced by employees, as a good guide in the transformation process intended to realize the organization's vision.

The transformation process aims to bring the organization closer to achieving its vision. This is because the transformation process is aimed at achieving the organization's vision (Lam *et al.*, 2021). This may be accomplished by offering more intellectual stimulation in the form of encouragement and support in addressing hurdles. Another way to achieve this goal is to provide constructive feedback. When leaders can provide a unique illustration of the organization's vision and mission, employees are better equipped to provide an honest appraisal of the degree to which they are fulfilled by the job that they do (Paais, 2020).

Existing academic literature has indicated that good leadership has a major effect on an employee's sense of pleasure in the workplace, which has been found to relate to positive organizational behavior (Lasrado and Kassem, 2021). Effective leadership is required to attain organizational objectives. It is described as a procedure that includes offering instructions to boost employee confidence and even paying attention to their staff when they are leading the employee.

Consequently, it is possible to say that employees will experience job satisfaction when an executive is able to notify his/her employees in the appropriate manner regarding his/her job performance. Effective leadership is a procedure for attaining the goals of the business by offering guidance to boost employee confidence and paying attention to them while properly guiding them. It is possible to make the assertion that employees will experience greater levels of job satisfaction when their leaders are able to provide them with accurate information (Ullah *et al.*, 2021).

Organizational behavior drives innovation within the company. Yun *et al.* (2020) view beliefs about open innovation as dynamism and complexity because the open dimension necessitates characteristics like workplace happiness and co-worker support that boost innovative work behavior, which is based on values such as diversity, curiosity, flexibility, and creativity.

Organizational behavior is defined as the employee characteristics within an organization that impact its long-term development. It illustrates how group members relate to the stakeholders that the organization collaborates with (Tung, 2021). In other words, an organization's customs and way of doing things are a set of rules that guide its operations, workflow, and customer management (Lam *et al.*, 2021; Tung and Dung, 2021). Organizational workforce is required to be aware of and follow implicit and unwritten standards that are part of company culture (Stewart *et al.*, 2019).

Knowledge management significantly contributes to enhancing innovation capability. The concept of organizational innovativeness is intricately linked to the generation and use of knowledge resources that are present within organizational contexts (Huang and Li, 2021; Lam *et al.*, 2021). It is evident that an organization's capacity for transforming and applying its knowledge is a primary factor in determining the degree of innovation it can achieve, such as faster problem-solving and more rapid response to alterations in the business environment. There was previous academic literature shed light on both the relevance and the usefulness of knowledge management in terms of its role in supporting and strengthening innovative capabilities.

A qualitative study conducted by Ibarra *et al.* (2020) on a sample of 78 small and medium-sized companies (SMEs) in Spain provides empirical evidence supporting the notion that the exchange of information on business requirements and technological capabilities, together with effective communication and collaboration with customers and partners, are essential prerequisites for fostering innovation inside organizations. Efficient knowledge management may boost a business's competitive advantages, customer focus, staff relations and development, innovation, and cost reduction.

Sikombe and Phiri (2019) suggest that the organizing instruments of knowledge management enable the process of knowledge transfer into organizational innovative capabilities and motivate organizational members to convert their individual expertise to collective knowledge. Migdadi *et al.* (2022) selectively use empirical methods to demonstrate that knowledge acquisition, sharing, and application have positive impacts on organizational technical and managerial innovation since knowledge management and organizational innovation are complicated processes. Conversely, there is an absence

of empirical proof about the kind of correlation among knowledge management and innovation capability. It is deduced that having good knowledge management capabilities may increase the efficacy of organizational innovation (Udin and Shaikh, 2022).

Furthermore, several academic literatures have argued the significance of knowledge management in businesses, suggesting that the adoption of these methods will facilitate process innovation (Lam *et al.*, 2021; Ibarra *et al.*, 2020). Through the development and execution of an effective knowledge management system, organizations are compelled to modify their conventional operational mindset regarding intellectual property management and employee working styles. This necessitates the adoption of novel processes, disciplines, and cultures, ultimately leading to the enhancement of organizational innovation capability.

This study was based on three anchor theories, which discussed the significance of each exogenous variable in enhancing the innovation capability of food manufacturing firms.

Graen and Uhl-Bien (1995) proposed the leader-member exchange theory, which posits that leaders differentiate their treatment of subordinates through individual exchanges, leading to varying-quality relationships. According to Li *et al.* (2020), leaders who establish leader-subordinate relationships with a high degree of leader-member exchange quality have the ability to enhance innovative performance. This is achieved through the provision of significant autonomy to subordinates, the allocation of organizational resources, and the cultivation of subordinates' confidence (Bundtzen and Hinrichs, 2021; Purwanto *et al.*, 2021).

The notion of Leader-Member Exchange (LMX) theory suggests that as work relationships grow, leaders and team members engage in reciprocal exchanges that progressively increase in value (Graen and Cashman, 1975). During the first phases of the working relationship, a leader evaluates the motivation, conduct, and performance of a team member to ascertain the appropriate level of decision-making in the context of authority, autonomy, and influence to provide that team member (Nazir *et al.*, 2021; Mascareño *et al.*, 2020). Leaders who have strong leader-member exchange (LMX) connections have a significant level of confidence in their colleagues (Calin *et al.*, 2021). As a result, they may have higher expectations for their members' performance outside their designated roles, such as innovation (Rafique *et al.*, 2022).

The examination of leadership and its impact on innovation has been the subject of investigation in several qualitative studies conducted on senior managers in Western countries and societies that prioritize individualism (Al-Ghanem *et al.*, 2020). The investigation of leadership behaviors and their implications in collectivist and socialist corporate environments, especially in emerging countries in the Asia-Pacific region, has received relatively less attention (Li and Rees, 2021; Calen *et al.*, 2021). Gaining insight into the factors that influence senior managers' views on leadership may aid in the refinement of leadership strategies and facilitate leaders' self-assessments, ultimately

leading to improved leadership effectiveness and enhancing innovation capability in business organizations (Rafique *et al.*, 2022).

The knowledge-based view theory (KBV) asserts that knowledge plays a crucial role as a strategic resource, enhancing a firm's competitive advantage (Cuthbertson and Furseth, 2022). This theory highlights the importance of knowledge assets, including both implicit and explicit information, as crucial factors in determining an organization's competitive edge. By acknowledging the importance of intellectual capital, companies may strategically use their knowledge management systems to improve their capacity to innovate. The enhancement of an organization's innovation capabilities is facilitated by investing in the development, acquisition, and management of knowledge. This investment serves as a fundamental basis for the generation of novel ideas, technologies, and solutions (Khraishi *et al.*, 2023).

Furthermore, the KBV theory emphasizes the significance of knowledge generation and assimilation in cultivating the capacity for innovation. According to Heenkenda *et al.* (2022), organizations that demonstrate proficiency in developing novel information and effectively integrating external knowledge sources are more ideally positioned to engage in innovative practices. Firms may boost their ability to absorb and integrate new ideas, technologies, and market insights, hence fueling innovation initiatives by fostering a culture of learning, experimentation, and effective knowledge management processes.

The KBV theory places significant emphasis on the significance of collaborative networks and connections in augmenting the capacity for creativity. Prakasa *et al.* (2022) stipulates organizations have the potential to enhance their knowledge management practices by active engagement in collaborative networks and open innovation initiatives. Consequently, companies are able to have access to a wide range of viewpoints, knowledge, and resources, thereby enhancing their capacity for innovation. Moreover, the KBV theory is in accordance with the notion of dynamic capacities, which pertain to an organization's capacity to perceive and react to changes in its surroundings by using its knowledge assets (Shehzad *et al.*, 2022). The continuous update and renewal of a company's knowledge base lead to the development of dynamic capabilities (Iqbal *et al.*, 2021). These competencies improve the firm's capacity to innovate, enabling them to predict market trends, recognize emerging possibilities, and produce creative solutions ahead of their competition.

Social learning theory (SLT) proposed by Bandura (1977) can be used as a framework to illustrate how organizational behavior enhances a firm's innovation capability. SLT theory posits that humans acquire knowledge by the process of seeing the actions of others and the resulting outcomes of those actions. Organizational learning may be facilitated by the observation and analysis of behaviors shown by peers, coworkers, supervisors, and leaders. According to Saunila (2020), when organizational behavior places emphasis on and provides incentives for creative mindset, there is a higher likelihood that employees would adopt and imitate these behaviors, hence boosting the organization's innovation capability.

In addition, organization's employees act as exemplars for one another, showcasing habits that may either foster or hinder innovation. Leadership has a significant role in shaping and influencing innovation by serving as role models. Leaders that demonstrate behaviors such as taking risks, conducting experiments, being receptive to new ideas, and providing support for innovation activities function as exemplars that motivate employees to adopt similar behaviors.

Moreover, the field of organizational behavior is subject to the impact of societal norms and expectations that dictate the parameters of acceptable conduct inside the corporate environment. According to Mehmood *et al.* (2020), when the organizational culture places importance on and promotes innovation, employees are more inclined to adhere to these norms and exhibit behaviors that facilitate innovation.

3. Material and Methods

3.1 Research Respondents

Selection of research respondents was done in accordance with a scientific methodology. The researcher was able to get a list of food manufacturing companies in Regions XI and XII that were in possession of a valid license to operate (LTO) using the official website of the Food and Drug Administration. There were four hundred seven (407) employees from different food manufacturing companies that participated in this survey as research respondents. These employees were selected using a stratified random selection method. The inclusion and exclusion criteria established were considered when selecting the sample size. According to Bhardwaj (2019), this kind of sampling yields more accurate results than most other sampling strategies. When using the structural equation model (SEM), it is advised to utilize at least 200 respondents sample size (Zhang *et al.*, 2021). SEM works with large samples in order to be more efficient and to reduce the number of measurement variances (Dash and Paul, 2021). Thus, it is appropriate and justified to collect a sample of four hundred seven individuals who participated in this research study.

The survey respondents who were included in this research study were employees of food manufacturing companies in Southern Philippines (Regions XI and XII) who are directly involved in the innovation activities of the company were included as research respondents and were the focus of this research study's target respondents. These employees came from a variety of departments, including Research and Development, Marketing and Sales, Quality Assurance, Production/Operations, Maintenance/Engineering, Accounting and Finance, and Information Technology (IT). Particularly, employees who were engaged into food safety practices such as Good Manufacturing Practices (GMP) and Hazard Analysis Critical Control Point (HACCP) within the company were included as research respondents since these employees are usually assigned in the Quality Assurance department. In addition, participating employees were selected as research respondents if they were at least a college level, a

regular employee, and employed for at least one year in the company where they are currently connected.

Employees who signed a Non-Disclosure Agreement (NDA) with their respective organizations about the innovation activities that their company is previously or currently engaging in were unable to participate and were excluded as one of the research respondents. Moreover, employees who had not yet been employed for at least one year in the company where they are currently connected were also excluded as research respondents.

Research respondents were not forced into surveying if they did not want to. The researcher did not coerce people into taking part in the study, and their involvement and participation were entirely voluntary. Individuals were allowed to discontinue their involvement at any moment or when they did not feel comfortable completing the questionnaire without providing a justification or paying any fees. The respondents could withdraw their participation at any time without jeopardizing their cooperation with the researcher. Those who chose not to respond to the questionnaire faced no pressure, and explanations were not sought from them.

3.2 Locale of the Study

The research study was conducted in the southern regions of the Philippines, namely Regions XI and XII. The locations in Region XI (particularly Davao City, Digos City, Panabo City, Tagum City, Davao del Norte, Davao del Sur, Davao Occidental, Davao Oriental, and Davao de Oro) and Region XII (particularly General Santos City, Koronadal City, Tacurong City, Kidapawan City, Cotabato City, South Cotabato, Cotabato Sultan Kudarat, and Sarangani) that responded to the survey were used to create clusters.

The study was carried out by the researcher in the food manufacturing companies situated in the southern regions of the Philippines (Regions XI and XII) in order to determine whether leadership, knowledge management, and organizational behavior influenced innovation capability. The innovation capability, which is considered to be the dependent variable in this research, as well as the extent of leadership, knowledge management, and organizational behavior, which are considered to be independent variables in this study, have a significant relationship on the food manufacturing industry of Regions XI and XII.

This research was considered to be the first multivariate research using structural equation modelling to investigate food manufacturing companies. In addition, the researcher had several acquaintances and associates who were currently employed by several food manufacturing enterprises located within Regions XI and XII. This makes it much easier for the researcher to acquire the information required to accomplish the purpose of the study.

3.3 Materials and Instruments

The study's survey items were obtained from other academic scholars who conducted related studies. To gather primary data covering and assessing the following constructs: leadership, knowledge management, organizational behavior, and innovation capability of food manufacturing companies in Regions XI and XII, a survey instrument that had been adapted and modified was utilized. The adapted research instrument was modified to better represent the survey items that are now being used for this research and the associated business environment in the area.

Expert validators from both within and outside the University of Mindanao approved the modified and adapted survey instrument. One external validator and five internal validators reviewed the adapted and modified research instrument. To validate the questionnaires, the following criteria were employed: the clarity of direction and items, presentation and organization of items, suitability of items, adequateness of items per category or indicator, attainment of purpose, the objectivity, and the scale and evaluation rating scale. After all, the adopted and modified research instrument was given an overall grade of 4.57, which is considered good.

The questionnaire was pre-tested using Cronbach Alpha, a technique used by academic scholars to evaluate the reliability of multiple-question surveys using the Likert scale to ensure that the instrument was appropriate and internal consistency was established. Cronbach alpha determines how closely a group of test items is related to each other (UCLA, 2021). The appropriate Cronbach's alpha value is 0.70 (Robertson and Evans, 2020). The corresponding Cronbach alpha values for leadership, knowledge management, organizational behavior, and innovation capability were .955, .959, .944, and .947, respectively. Furthermore, the scale components' internal consistency increases as the Cronbach alpha value approaches one (Nawi *et al.*, 2020).

The first survey instrument measured the leadership approaches in food manufacturing companies. The items were adapted using Arnold *et al.* (2000) methodology. The tool assessed participative leadership, coaching leadership, and informed leadership in the food manufacturing sector. The second instrument was based on the Knowledge Management Scale (Lee and Choi, 2003). The instrument's design used five indicators — collaboration, trust, formalization, t-shaped skills and learning, to measure how likely employees in the food manufacturing sector perceived their organization is practicing knowledge management mechanisms.

Moreover, the third research tool was adapted from the study of Melhelm *et al.* (2017). The research instrument utilized four indicators — workplace happiness, co-worker support, innovative work behavior and job stress in order to gauge organizational climate influences the creative and innovative behavior among employees in the food manufacturing companies. The fourth tool was adapted from Liao *et al.* (2006) research to measure innovation capability in food manufacturing companies. The three criteria were product innovation, process innovation and management innovation.

` A five-point Likert scale ranging from "strongly disagree" to "strongly agree" was used by respondents in order to evaluate their responses to the survey items. Table 2

displayed the scale that was used in order to interpret the degree of relationship between the variables being studied.

Table 2: The descriptive level interpretation of the respondents' answers to the survey questionnaire

Range of Means	Descriptive Level	Interpretation
4.20-5.00	Very High	Leadership, knowledge management, organizational behavior, and innovation capability are always executed.
3.40-4.19	High	Leadership, knowledge management, organizational behavior, and innovation capability are often executed.
2.60-3.39	Moderate	Leadership, knowledge management, organizational behavior, and innovation capability are sometimes executed.
1.80-2.59	Low	Leadership, knowledge management, organizational behavior, and innovation capability are seldom executed.
1.00-1.79	Very Low	Leadership, knowledge management, organizational behavior, and innovation capability are seldom executed.

3.4 Design and Procedure

The purpose of this research was to develop the most appropriate model for innovation capability by combining a structural equation model with a descriptive-predictive method. It was a research design that was quantitative and did not include experiments. Non-experimental research design is one of the most prevalent types of research designs. In this kind of research, the researcher observes things as they occur naturally without adding any external stimuli (Asenahabi, 2019).

The purpose of a descriptive study is to provide an illustration of the occurrence and to classify it (Nassaji, 2021). SEM was used in order to develop the model that was the most appropriate for this study's constructs. In the field of scientific research, structural equation modeling is a strong multivariate tool that is used to examine and evaluate multivariate causal linkages (Kharuddin *et al.*, 2020). Within the research conducted by van Bork (2021), it is emphasized that the structural model is responsible for determining the link between the latent variables.

The data were encoded, tabulated, and further evaluated by using various statistical methodologies. Mean was used to evaluate and measure leadership, knowledge management, organizational behavior, and innovation capabilities. The Pearson Product Moment Correlation (Pearson r) was used to determine the correlation between leadership, knowledge management, organizational behaviour, and innovation capability. The analysis of the relationship was carried out with the help of the Parvez Ahammad table that was published by Jaadi (2019). The rating and interpretation were as follows: a rating of ±0.91 or higher indicates a strong correlation, a rating of ±0.61 to ±0.90 indicates a moderate correlation, a rating of ±0.31 to ±0.60 indicates a slight correlation and a rating of ±0.00 to ±0.30 indicates a poor correlation.

Furthermore, multiple regression was utilized in order to ascertain which aspects of leadership, knowledge management, and organizational behavior have a significant

impact on the innovation capability of food manufacturing companies located in Regions XI and XII. As a result, the utilization of SEM was necessary in order to determine the model that provided the best fit. All of the indices have to fall within the acceptable range in order to find the model that was considered as best-fit. When it comes to the Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), and Tucker-Lewis Index (TLI), values that are more than 0.95 are suggestive of a good fit (Hu and Bentler, 1999). The Root-Mean Square Error (RMSEA) to be less than 0.08 (MacCallum *et al.*, 1996), and the Chi-square/Degrees of Freedom (CMIN/DF) should be between 0 and 2. Moreover, Jamovi software was utilized in running the structural equation modelling analysis.

The purpose of this research project was to investigate the correlation between three independent factors, namely leadership, knowledge management, and organizational behavior, and the dependent variable, innovation capability. A variety of methods were used to collect the data for the investigation.

In accordance with Protocol Number UMERC-2023-367 issued last July 25, 2023, the researcher was granted a Certificate of Approval by the University of Mindanao Ethics Research Committee (UMERC) to carry out the data-gathering process of the study. The subsequent step for the researcher was to administer the validated questionnaires to the food production companies in Davao City and perform pilot testing at those companies for reliability tests.

Moreover, the researcher adhered to the safety procedure that had been established for the study because of the COVID-19 pandemic. Taking into consideration the findings of the Cronbach alpha, the statistician suggested the continuation of the data gathering process. As a result, the researcher distributed and gathered validated questionnaires among food manufacturing companies in Regions XI and XII between the months of August to November 2023.

4. Results and Discussion

4.1 Descriptive Statistics

4.1.1 Leadership in Food Manufacturing Industry

The extent of leadership support in the food manufacturing industry in Regions XI and XII. The overall mean score for leadership was 4.20, very high, and the standard deviation was 0.64. implies that employees in food manufacturing companies in Regions XI and XII perceived supportive leadership in their respective organizations.

The following three indicators are made public – the average grade for participative leadership was 4.24; for coaching leadership, it was 4.21; and for informing leadership, it was 4.13. Informing leadership had the lowest mean but a high descriptive level, whereas participative leadership had the highest mean and a very high descriptive level.

All metrics, except informing leadership, are credited with a very high level of leadership support in food manufacturing companies. This means that employees often

observe the leadership styles of their respective top management and business executives in various food manufacturing companies in Regions XI and XII. Meanwhile, informing leadership got a high descriptive level with a mean of 4.13, which indicates that organizational leaders in food manufacturing companies share critical information with the whole organization, including the vision, purpose, corporate objectives, and business philosophy. However, there is also a limit on the confidential information that the top management can share with their employees, such as product formulations, processing flow and partnership with several suppliers who provide classified ingredients essential in the daily business operations of the company.

The results are consistent with those of Ramdani *et al.* (2023), who assert that leaders play a crucial role in driving the accomplishment of organizational objectives. It may be said that the leader's competence will have a substantial impact on their performance in coordinating and overseeing their team, enabling them to achieve optimal outcomes. Yusnandar and Hasibuan (2021) stipulate that a leader exercises their power and leadership to guide others and take responsibility for their performance in attaining organizational goals.

The leadership style of a leader (e.g. participative, coaching and informing) plays a crucial part in organizing, managing, and directing their team towards achieving the objectives and aims of the organization. Subsequently, a leader implements this particular leadership approach to coordinate and oversee all aspects of the task. The leader's leadership style will directly impact the success of the team or employees. Organizational leadership aims to increase the quality of work life by fostering management skills and leadership potential among subordinates, leading to a more creative work environment (Purwati *et al.*, 2021).

4.1.2 Organizational Behavior in Food Manufacturing Industry

The level of organizational behavior in the food manufacturing industry in Regions XI and XII. The overall mean score for organizational behavior was 4.31, which is very high, and the standard deviation was 0.46. This implies that employees in food manufacturing companies in Regions XI and XII support organizational behaviour in their respective companies.

The average score for the indicators of organizational behaviour was 4.38 for workplace happiness, 4.26 for co-worker support, and 4.28 for innovative work behaviour. All indicators under organizational behaviour indicate a very high descriptive level. The result suggests that employees in food manufacturing companies were contented with the level of organizational behavior being implemented in their respective companies in the context of workplace happiness wherein they perceived their work environment as pleasant and enjoyable, experiencing co-worker support through social exchange ties with various partners within the workplace and innovative work behavior where employees could foster an innovative culture within the workplace environment that promotes creative thinking and creation of innovative ideas in daily business operations and job routines.

The results are consistent with those of Ali and Anwar (2021a), which emphasize the importance of organizational behaviour in food manufacturing companies. Organizational behavior is vital in determining the working atmosphere, affecting employee productivity, and eventually influencing the overall achievement of the company's goals and objectives.

Gaining insight into the organizational behavior inside food manufacturing organizations is crucial for cultivating a favorable work environment that promotes high levels of productivity and efficiency among employees. Consequently, establishing efficient communication and cooperation will result in simplified manufacturing processes and reduced errors. Furthermore, a favorable organizational behavior that values importance on employees and their welfare has a significant role in increasing job satisfaction and employee retention.

An organization that emphasize the importance of organizational behavior is more inclined to adjust to changes, guaranteeing long-term viability successfully (Khan *et al.*, 2021). This is particularly crucial in food manufacturing companies, which are susceptible to several external influences, including legislative shifts, market trends, and technology. Finally, understanding how to motivate employees to actively participate in suggesting ideas and enhance different organizational processes and procedures is essential for maintaining a competitive edge in a swiftly changing industry (Nuryanto *et al.*, 2024).

4.1.3 Knowledge Management in the Food Manufacturing Industry

The level of knowledge management in the food manufacturing industry in Regions XI and XII. The overall mean score for knowledge management was 4.20, which is very high, and the standard deviation was 0.49, indicating that employees in food manufacturing companies in Regions XI and XII practiced different knowledge management mechanisms in their respective organizations.

The following four indicators have the following average responses namely – collaboration at 4.20; trust at 4.21; formalization at 4.13 and T-shaped skills at 4.27. Formalization had the lowest mean but a high descriptive level, whereas T-shaped skills had the highest mean and a very high descriptive level.

All indicators, except formalization, are credited with a very high level of knowledge of management mechanisms in food manufacturing companies. The results suggest that there is an effective implementation of knowledge management processes in various food manufacturing companies in Regions XI and XII. Meanwhile, formalization got a high descriptive level with a mean of 4.13, which indicates that the established guidelines, normative practices, and protocols implemented to which choices and interpersonal interactions are regulated within the company. It indicates that employees in food manufacturing companies have to abide by the existing rules and regulations of the company in their pursuit of executing innovative organizational activities.

The results are consistent with those of Chaithanapat *et al.* (2022), which emphasize the importance of knowledge management in micro, small and medium enterprises, particularly food manufacturing companies. Knowledge management is

vital in helping organizations leverage their intellectual assets to enhance performance, innovation and market competitiveness (Ferraris *et al.*, 2021). Through the implementation of an effective knowledge management mechanism, access to a collective pool of knowledge could lead to innovation activities such as product development initiatives and process improvements, allowing food manufacturing companies to remain competitive in the marketplace.

Proper knowledge management facilitates the sharing of knowledge between different organizational units about efficient production processes and operational procedures (Ali and Anwar, 2021b). As a result, standardizing and disseminating best practices across the organization can lead to increased efficiency, reduced errors and improved overall operational performance. Rehman *et al.* (2022) posit that knowledge management enables continuous improvement initiatives through capturing and analyzing data on performance, internal processes and stakeholders' feedback. Identifying areas for improvement and implementing changes based on stakeholders' feedback contributes to food manufacturing companies' long-term viability and growth.

4.1.4 Innovation Capability in the Food Manufacturing Industry

The extent of innovation capability in the food manufacturing industry in Regions XI and XII. The overall mean score for innovation capability was 4.34, very high, and the standard deviation was 0.53. The average score for the indicators of innovation capability was 4.33 for product innovation, 4.34 for process innovation, and 4.35 for management innovation. All indicators under innovation capability indicate a very high descriptive level. The result suggests that food manufacturing companies in Regions XI and XII are implementing various innovation activities in their respective organizations as part of their business strategy.

The findings coincide with those of Oliveira *et al.* (2019), emphasizing the significance of innovation capabilities in low-tech sectors like the food manufacturing industry. Although the food production business is considered low-tech, it nonetheless engages in product, process, and management innovation. Ali *et al.* (2020) state that low-technology industries often rely on their suppliers and must assimilate technical advancements, particularly those from machinery and equipment providers. This involves incorporating these new technologies into their manufacturing processes to enhance efficiency.

Various forms of innovation within organizations, such as novel process efficiencies, managerial processes, product commercialization methods, marketing activities, and supply chain management, can significantly impact the economic growth of the food manufacturing industry (Yoon *et al.*, 2023; Leo *et al.*, 2022).

Food manufacturing companies have developed and maintained characteristics that prioritize their capacity to consistently conduct the same operations for goods that undergo few changes, rather than continuously striving to innovate and add value, resulting in a prevailing framework that prioritizes incremental product innovation over radical innovation (Saunila, 2020).

The manufacturing process in the food business is regarded as complicated, despite its apparent simplicity in product creation. Typically, it entails collaboration among multiple stakeholders in the supply chain (Ferraris *et al.*, 2020). In addition to process innovation, the implementation of new business models plays a significant role in food industry companies (Galanakis, 2021). Considering the significance of innovation in product, process, and management, as well as the necessary collaboration with many players in the supply chain, it is evident that food sector companies enhance well-developed skills in product, process, and management innovation.

4.2 Inferential Statistics

4.2.1 Correlation between Leadership and Innovation Capability

The combined computed r-value of 0.408 denotes a slight correlation, and $p<.001$; the result indicates that leadership have a significant relationship with innovation capability. The results suggest that the null hypothesis was rejected. Additionally, innovation capability was slightly correlated with participative leadership, coaching leadership and informing leadership, with an r-value of 0.353, 0.395, and 0.320, respectively, with $p<.001$ making them significant.

The study's null hypothesis was rejected due to the variable relationship test, which reveals a crucial link between leadership and innovation capability. It means that there is an association between leadership and innovation capability in food manufacturing companies. Also, the indicators of leadership, namely participative leadership, coaching leadership and informing leadership, have a significant relationship with innovation capability.

The results supported the previous research results made by other related academic studies. Leadership has a crucial role in identifying and promoting principles that contribute to the long-term viability of a business, including fostering innovation and adapting to changing environments (Bagheri *et al.*, 2022). Leaders have significant influence in fostering innovation by establishing and cultivating a favorable environment that encourages the skills and behaviors necessary to enhance innovation capability.

The findings are consistent with the research conducted by Alblooshi *et al.* (2021), which suggests that leadership positively correlates with innovation capability by fostering an environment where employees are encouraged to debate and experiment with new ideas and techniques openly.

Tanase (2020) highlighted that organizational leaders have a direct or indirect impact on a firm's ability to innovate by enhancing the firm's capacity for learning. According to Hoang *et al.* (2021), leadership has a significant impact on creating an organizational environment that promotes experimentation and the implementation of new ideas, processes, procedures, or structures.

The study conducted by Sawako (2020) provided data supporting a favorable correlation between leadership and both workers' creative behaviors and organizational innovation. In addition, Yin *et al.* (2020) found that leadership has a direct or indirect

impact on organizational innovation performance via the promotion of innovation openness.

4.2.2 Correlation between Organizational Behavior and Innovation Capability

The combined computed r-value of 0.425 denotes a slight correlation, and p<.001; the result indicates that organizational behaviour has a significant relationship with innovation capability. The results suggest that the null hypothesis was rejected. Additionally, innovation capability was slightly correlated with workplace happiness, co-worker support and innovative work behavior, with an r-value of 0.33, 0.411, and 0.362, respectively, with p<.001 making them significant.

As a result of examining the correlations between the variables, which show a substantial correlation between organizational behavior and innovation capability in food manufacturing companies, the study's null hypothesis is rejected. Additionally, it is noted that indices of organizational behavior, such as workplace happiness, co-worker support and innovative work behavior, indicate a slight correlation with innovation capability.

The results supported the previous research results made by other related academic studies. Organizational behavior plays a vital role in the innovation capability of food manufacturing companies. Positive organizational behavior cultivates a workplace environment that promotes employee motivation and engagement (Lam *et al.*, 2021).

Enhanced employee motivation correlates with a higher probability of generating creative ideas and actively engaging in the innovation process. Furthermore, organizational behavior fosters the development of teamwork, collaboration, and open communication inside the company. According to Tang *et al.* (2020), innovation often entails the cooperation of people from various organizational departments or units. An environment that promotes cooperation enables the exchange of ideas, specialized knowledge, and varied viewpoints, which is crucial for fostering creativity.

Organizational behavior has a direct impact on the capacity of employees to adjust and respond effectively to changes in a company (Zeb *et al.*, 2021). In the food manufacturing industry, the capacity to adapt to emerging trends, technology, and market demands is essential for fostering innovation. A company with a flexible and adaptive culture encourages experimentation and a readiness to take measured risks.

4.2.3 Correlation between Knowledge Management and Innovation Capability

The null hypothesis was rejected since the combined r-value of 0.502 from the measurements, with p<.001, indicates a slightly positive correlation between knowledge management and innovation capability in food manufacturing companies. Furthermore, it is observed that collaboration has an r-value of 0.360, p<.001; trust has an r-value of 0.475, p<.001; formalization has a r-value of 0.397, p<.001 and T-shaped skills has a r-value of 0.435, p<.001 which indicates a slight correlation on innovation capability.

Analysis of the link between the variables in the research showed a slight correlation between knowledge management and innovation capability, leading to rejecting the null hypothesis. This suggests a significant relationship between knowledge management and innovation capability.

The results supported previous research results made by related academic studies. Knowledge management is significantly correlated with the innovation capability of food manufacturing companies. Lam *et al.* (2021) provided evidence that knowledge management among personnel is positively correlated with a firm's innovation capability. Innovation efforts primarily stem from the exchange of information, experience, and talent.

The extent of a firm's innovation capability is determined by its ability to convert and use knowledge. The involvement of workers in knowledge management leads to learning and enhances their skills and competences, hence improving their capacity to design new routines and processes as well as innovative products (Hock-Doepgen *et al.*, 2021). Knowledge management is the methodical process of collecting, organizing, and preserving the knowledge held inside an organization. In the food manufacturing industry, where product formulation, processes, and techniques are crucial, it is important to preserve this information to prevent the loss of critical insights and best practices when personnel go, or circumstances change.

Moreover, efficient knowledge management systems promote collaboration by offering opportunities for employees to exchange their skills, experiences, and ideas. In an innovative environment, cross-functional cooperation is vital, and a strong culture of sharing knowledge guarantees that pertinent information is readily available to those who need it (Chatterjee *et al.*, 2021).

4.3 Convergent and Discriminant Validity

The scales used to measure the constructs in this study underwent testing to ensure their construct validity. A measure has construct validity if it can assess the hypothetical construct or feature for which it was designed (Hair *et al.*, 2011). In order to assess the convergent validity of the constructs used in this study, Cronbach's alpha, average variance extracted (AVE), and composite reliability (CR) were analyzed. The suggested threshold values for Cronbach's alpha, AVE, and CR are 0.6, 0.5, and 0.7, respectively (Hair *et al.*, 2011; Bagozzi *et al.*, 1991).

Table 3 shows that all Cronbach's alpha readings were over 0.8, surpassing the acceptable requirement. All of the Average Variance Extracted (AVE) values exceeded 0.5, indicating that the examined constructs had convergent validity. In addition, the composite dependability of the factors was also found to be over 0.7, suggesting a good level of internal consistency (Hair *et al.*, 2011). In addition, it is noteworthy that all the variables exhibited outer loadings over 0.6, so meeting the theoretical criterion set by Henseler (2017) and affirming the construct validity of the scales.

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Table 3: Convergent validity test of leadership, organizational behavior, knowledge management and innovation capability

Latent Variables	Indicators	Loadings	Cronbach's Alpha	Composite Reliability	AVE
	Threshold		**≥ 0.7**	**≥ 0.7**	**≥ 0.5**
Leadership	Participative Leadership	0.763	0.831	0.831	0.622
	Coaching Leadership	0.855			
	Informing Leadership	0.762			
Organizational Behavior	Workplace Happiness	0.746	0.811	0.810	0.590
	Co-worker Support	0.856			
	Innovative Work Behavior	0.736			
Knowledge Management	Collaboration	0.676	0.840	0.822	0.562
	Trust	0.824			
	Formalization	0.747			
	T – shaped Skills	0.749			
Innovation Capability	Product Innovation	0.779	0.866	0.868	0.687
	Process Innovation	0.832			
	Management Innovation	0.871			

Discriminant validity was also determined with the best-fit model by comparing the shared variances between factors with the square root of the average variance extracted for each construct. Table 3 showed that the variance extracted for any three constructs was found always greater than the squared correlation estimate, inferring results supported the discriminant validity of the scales (Fornell and Larcker, 1981).

Leadership was found to have slight positive relationships with commitment ($r=0.408$, $p<.001$), slight positive relationships with knowledge management ($r=0.353$, $p<.001$) and slight positive relationship with organizational behavior ($r=0.309$, $p<.001$). In addition, organizational behavior demonstrates slight positive relationship with knowledge management ($r=0.583$, $p<.001$) and slight positive correlation with innovation capability ($r=0.425$, $p<.001$). Furthermore, assessments of the results revealed that knowledge management was slightly positively correlated to innovation capability ($r=0.502$, $p<.001$).

As presented in Table 5, the hetertrait-monotrait ratio of correlations was indicated. Results showed that all figures from the different constructs have values ranging from 0.379 to 0.709, lower than the proposed threshold of 0.9, to establish discriminant validity (Henseler *et al.*, 2015). This result supported the prior analysis of discriminant validity utilizing the square root of the average variance of extraction (AVE) as presented in Table 4.

Table 4: Discriminant validity using Fornell-Larcker criterion

	Average Variation Extracted	Maximum Squared Variance	Leadership	Organizational Behavior	Knowledge Management	Innovation Capability
Leadership	0.622	0.166	**0.789**			
Organizational Behavior	0.590	0.340	0.309*	**0.768**		
Knowledge Management	0.562	0.252	0.353*	0.583*	**0.750**	
Innovation Capability	0.687	0.252	0.408*	0.425*	0.502*	**0.829**

*p<.001

Table 5: Heterotrait-monotrait (HTMT) ratio of correlations

	Leadership	Organizational Behavior	Knowledge Management
Leadership			
Organizational Behavior	0.379		
Knowledge Management	0.424	0.709	
Innovation Capability	0.482	0.509	0.590

4.4 Structural Equation Modelling

The six developed models for the study are listed in Table 6, along with their Goodness of Fit scores. The working models were presented based on the relationships that were obtained based from the results of previous academic researches related to this study. All indices had to constantly fall within the permitted range, which was the basis for choosing the best-fit model.

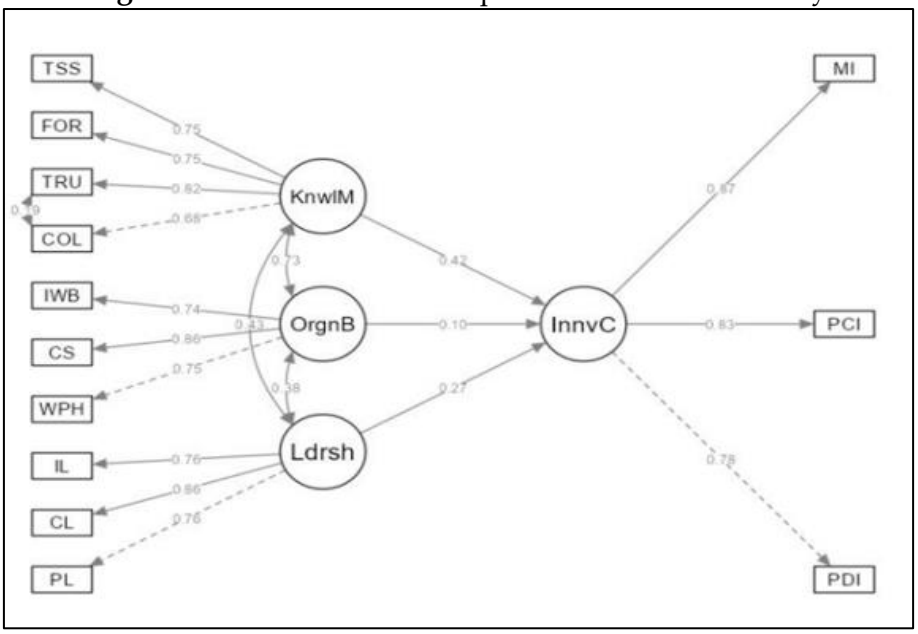
In order to indicate a satisfactory fit, it is recommended that the values of the Comparative Fit Index (CFI), Goodness of Fit Index (GFI), and Normed Fit Index (NFI) should be greater than 0.90 (Hatcher and O'Rourke, 2013; Chou and Bentler, 1995). The Root Mean Square Error of Approximation (RMSEA) should be less than 0.08 (Kline, 2018), while the Standardized Root Mean Square Residual (SRMR) should be below 0.09 (Hair, 2009). Additionally, the Adjusted Goodness of Fit should be above 0.80 (Hair *et al.*, 2010), and the Parsimony Normed Fit Index should be above 0.50 (Meyers *et al.*, 2016).

As presented in Table 6, Model 1 meets the specified conditions, indicating that it is the best-fit model for this study. Therefore, the model proposed in this research exhibited a correlation between the identified constructs, namely leadership, knowledge management, organizational behavior and innovation capability and was deemed satisfactory. Hence, the null hypothesis was rejected. The study has presented a best-fit model that forecasts the innovation capability of food manufacturing companies in Regions XI and XII. Figure 1 displays the standardized path coefficients of the best fit model. These coefficients indicate the strength of the direct link between the constructs being studied.

Table 6: Summary of Goodness of Fit Measures of the Six Generated Working Models

Goodness of Fit	Criterion	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CMIN/DF	0<value<2	1.178	1.295	1.295	1.553	1.553	1.581
P value	>0.05	0.167	0.067	0.067	0.004	0..004	0.003
NFI	>0.95	0.974	0.972	0.972	0.965	0.965	0.966
TLI	>0.95	0.995	0.991	0.991	0.983	0.983	0.982
CFI	>0.95	0.996	0.993	0.993	0.987	0.987	0.987
GFI	>0.95	0.999	0.999	0.999	0.999	0.999	0.999
RMSEA	<.08	0.021	0.027	0.027	0.037	0.037	0.038

Figure 1: Best Fit Structural Equation Model of the Study



Legend: PL – Participative Leadership; WPH – Workplace Happiness**;** CL – Coaching Leadership; CWS – Co-worker Support**;** IL – Informing Leadership; IWB – Innovative Work Behavior**;** Ldrsh – Leadership; OrgnB – Organizational Behavior**;** COL – Collaboration; PDI – Product Innovation**;** TRU – Trust; PCI – Process Innovation; FOR – Formalization; MI – Management Innovation**;** TSS – T – Shaped Skills; InnvC – Innovation Capability**;** KnwlM – Knowledge Management

4.5 Significant Influence of Leadership, Organizational Behavior and Knowledge Management on Innovation Capability

Prior to the dynamic shifts in the business landscape, such as the industrial revolution, the pursuit of globalization, digitalization, and free trade agreements, enhancing innovation capability has been acknowledged as a vital element for companies to address the uncertainties, growing competition, and achieve a competitive advantage (Novillo-Villegas *et al.*, 2022; Efendi *et al.*, 2020). It is, therefore, imperative to address how to effectively enhance the potential of companies to innovate, which is consistently a primary focus for both researchers and professionals.

The paper has significantly contributed to the advancement of leadership, knowledge management, organizational behavior and innovation management theories by investigating and emphasizing the roles of leadership, knowledge management, and

organizational behavior as crucial factors in determining innovation capability, specifically in the food manufacturing industry.

Table 7: Summarized Results of the Relationships between Leadership, Organizational Behavior, Knowledge Management and Innovation Capability in Food Manufacturing Companies

Paths	β	Estimate	p-value
Leadership —> Innovation Capability	0.269*	0.230	<.001
Organizational Behavior —> Innovation Capability	0.097	0.100	0.246
Knowledge Management —> Innovation Capability	0.417*	0.508	<.001

*p<.001

Table 7 revealed a path coefficient of 0.269 ($p<0.001$) for the relationship between leadership and innovation capability, indicating that leadership significantly influences innovation capability among food manufacturing companies, which aligns with the results of other existing academic research. Adopting a participatory, coaching, and informative leadership style promotes an environment of open communication, mutual respect, and personal trust inside a company (Giorgi *et al.*, 2020).

An environment encouraging collaboration among leaders may enhance the capacity to recognize, absorb, convert, and use knowledge via extensive interdepartmental exchanges. Various leadership styles, such as participatory, coaching, and informative leadership, can inspire people to engage in innovation and create new goods and processes, enhancing their alignment with the organization's goals (Le, 2020).

It is postulated that implementing participatory, coaching and informative leadership styles significantly influences workers' capacity to innovate by fostering an atmosphere in which they are encouraged to engage in open discussions, experimentation, and the generation of novel ideas. Employees in such a working environment may be motivated to enhance the quality of goods and services to satisfy requirements despite limited resources. Therefore, it is seen that visionary and inspiring leaders have a beneficial impact on innovation performance. Leaders foster creativity and innovation by promoting divergent thinking among their subordinates in difficult circumstances (Alrowwad *et al.*, 2020).

Leaders refrain from criticizing followers whose opinions diverge from their own. Consequently, promoting open communication and a favourable working atmosphere facilitates the emergence of novel ideas and innovative solutions from team members (Escrig-Tena *et al.*, 2021). Effective leadership entails a deep comprehension of the organization's mission and the ability to foster a creative and forward-thinking work environment. Leaders who demonstrate participatory, coaching, and informative leadership traits strive for excellence that exceeds expectations. Consequently, this fosters the enhancement of workers' capacity to engage in critical thinking and generate novel concepts, thus facilitating the advancement of innovative products and processes (Li *et al.*, 2021).

Furthermore, the results supported the leader-member exchange theory, which stipulates that effective leaders engage with their subordinates to assist in attaining vision and goals, optimize the value of, and influence and increase the expectations, levels of happiness, and levels of performance of the team members, including enhancing organizational innovation capability.

Second, the path coefficient for knowledge management and innovation capability was 0.417 ($p<0.001$), indicating a significant relationship between knowledge management and innovation capability in food manufacturing companies. This finding is consistent with the conclusion of several existing academic literature indicating that the study from (Salunke *et al.*, 2019) claims that efficient knowledge management is crucial for fostering innovation within an organization.

An organizational culture that promotes cooperation, mutual trust, formalization, and T-shaped skills may significantly improve knowledge sharing, transfer, and procedures within the corporate environment. According to Gloet and Samson's (2020) study, there is a significant correlation between the quality of decision-making and the capacity to acquire, structure, and disseminate information. When an organization exhibits high cooperation, trust, formalization, and T-shaped abilities, it may accelerate information and knowledge management. This is because these factors foster mutual solid trust, enhancing the organization's innovative potential.

Efficient implementation of knowledge management strategies enhances organizational members' willingness to embrace innovative applications (Abbas *et al.*, 2020). In other words, when functional departments acquire, apply, and share information via internal networks, it may increase their willingness to engage in creative activities, ultimately leading to improved innovation (Ferraris *et al.*, 2021; Sun *et al.*, 2020).

The correlation between knowledge management and innovation capability offers valuable insights for managers seeking to successfully implement knowledge management techniques and ultimately boost the overall innovation capability of the company. The level of creativity inside an organization is crucial for comprehending its efficacy, development, and ability to endure (Migdadi, 2022). The findings indicate that the firm's capacity to convert knowledge into tangible economic value is essential for improving organizational innovation capabilities. Disregarding the connection between innovation capability and knowledge management may harm the organizational business environment.

Knowledge management enables organizations to streamline and optimize their innovation processes by identifying areas for improvement from lessons learned from past innovation projects, refining their innovation methodologies and implementing best practices to enhance innovation capability over time. Furthermore, knowledge management supports efficient decision-making processes. Access to relevant and up-to-date knowledge through knowledge management systems enables faster and more informed decision-making. When employees have easy access to the information they need, they can make decisions more confidently and effectively, allowing for quicker implementation of innovative ideas and solutions.

Effective knowledge management contributes to developing and preserving intellectual capital within organizations. As employees contribute their expertise, insights, and experiences to knowledge repositories, organizations build a valuable reservoir of intellectual assets that can fuel future innovation efforts and give them a competitive advantage in the marketplace.

Shaping cultural variables is essential for a firm's capacity to manage information efficiently. A corporate climate that promotes trust and open-mindedness significantly encourages members of organizations to engage in knowledge exchange activities via networking connections. Moreover, the findings also support the knowledge-based view theory, which highlights the important role of knowledge management in enhancing innovation capability.

Lastly, the path coefficient for organizational behavior and innovation capability was 0.097 (p=0.246), indicating that there is no significant relationship between organizational behavior and innovation capability in food manufacturing companies. The results indicate that organizational behavior does not influence innovation capability in food manufacturing companies.

There are several possible reasons why organizational behavior has no significant relationship with innovation capability. According to Beckett and Loughlin (2016), the timing of innovation management has four primary elements: place, idea, resources, and time. First, in the context of time, when the data gathering process was conducted last August – November 2023, it was during the peak season months of various food manufacturing companies, which were preparing to store a sufficient amount of inventory needed for the upcoming holiday season.

During peak seasons, food manufacturing companies often prioritize meeting increased production demands to fulfil orders and meet consumer demands, especially for companies exporting their products to other countries (Nurprihatin *et al.*, 2021). This can result in resources such as time, manpower, and budget being allocated predominantly towards production activities, leaving limited resources available for innovation activities. In addition, peak seasons typically involve tight deadlines and high-pressure environments to ensure products are delivered on time. This can leave employees little time to dedicate to brainstorming, experimenting, and implementing innovative ideas.

Moreover, food manufacturing companies tend to have a heightened focus on maintaining quality standards and ensuring operational efficiency to meet increased demand. This risk-averse mindset may discourage employees from taking risks or trying out new ideas that could potentially disrupt production processes or compromise product quality. According to Kraus *et al.* (2020), companies may prioritize short-term goals such as maximizing production output and meeting immediate customer needs. This can lead to a shift in focus away from long-term strategic initiatives, including innovation activities that may not yield immediate returns (Oron Semper *et al.*, 2021).

Furthermore, the increased workload and pressure during peak seasons can lead to employee burnout, reducing their capacity and motivation to engage in creative

thinking and innovation activities (Albort-Morant *et al.*, 2020). Aside from that, peak seasons in food manufacturing companies often require intense coordination and collaboration among different departments to ensure smooth production processes. However, this increased focus on operational tasks may result in limited opportunities for cross-functional collaboration and knowledge transfer, which are essential for fostering innovation. If silos exist between departments in food manufacturing companies, communication barriers may hinder the exchange of ideas and inhibit collaborative innovation efforts.

5. Recommendations

The relationship among leadership, knowledge management, and innovation capability can provide useful insights for managers regarding developing a strong culture, effectively promoting knowledge management practices, and eventually enhancing the whole organization's innovation capability. An organization's creativity provides a key to understanding its effectiveness, growth, and survival.

Enhancing innovation capability enables food manufacturing companies to develop new and innovative products that meet evolving consumer preferences and market trends. This can help differentiate their offerings from competitors and attract new customers. In addition, improving innovation capability allows companies to identify and implement more efficient manufacturing processes, leading to cost savings, higher productivity, and improved operational performance. Aside from that, enhanced innovation capability opens up new market opportunities and enables food manufacturing firms to expand their product portfolios, enter new market segments, and explore untapped geographic markets, which can drive revenue growth and increase market share over time.

The structural equation model presented incorporated innovation capability because it is the seed of all innovation and represents the firm's ability to transform knowledge into business value. Neglecting the relationship between innovation capability to leadership and knowledge management may undermine a business environment. Shaping cultural factors is crucial for a firm's ability to manage knowledge effectively as a trust-based and open-minded business environment strongly encourages the organizations' members to participate in knowledge exchange activities via networking relationships.

The best-fit model shows leadership, knowledge management, and organizational behaviour as determinants of innovation capability in food manufacturing companies, suggesting that the model should be supported as a framework for enhancing various food manufacturing companies' innovation projects and activities. Additionally, it would be beneficial to investigate other factors such as business ethics, partnership and collaboration, risk management, and regulatory environment, which might contribute to enhancing innovation capabilities in food manufacturing companies that were not included in this study. Moreover, it is advisable to do comparison research to find

dependable elements that need to be considered in this study. Subsequent researchers may use the variables employed in this study to evaluate if they influence innovation capability in other industries.

6. Conclusion

The results of this study established a structural equation model that indicates the determinants of innovation capability in food manufacturing. Among the six working models presented in the study, model one was considered the best-fit structural equation model that represents the relationship between leadership, knowledge management, organizational behaviour and innovation capability in food manufacturing firms. Results showed that leadership and knowledge management significantly influenced innovation capability. On the other hand, organizational behavior has no significant relationship with innovation capability.

The results indicate that leadership is one of the critical determinants in enhancing innovation capability in food manufacturing companies. Leaders empower employees by giving them autonomy, decision-making authority and necessary resources to pursue innovation. By delegating responsibility and trusting employees to take ownership of innovation projects, leaders foster a sense of ownership and accountability among team members. In addition, leaders facilitate collaboration and communication across different departments and teams within the organization. Moreover, leaders embrace uncertainty and navigate change effectively to drive innovation. Leaders position their organizations to seize new opportunities and stay ahead of the market competition by remaining agile, adaptable and responsive to market dynamics and emerging trends.

Research findings suggest that knowledge management is one of the key determinants of enhancing innovation capability in food manufacturing companies. Knowledge management facilitates sharing information, expertise and best practices among employees, departments and teams. It creates a fertile environment for innovation to flourish. In addition, efficient knowledge management systems provide employees with access to a wealth of knowledge, including market insights, consumer trends, and technical expertise, which serves as a valuable resource for generating innovative ideas and solutions in the company. Knowledge management also fosters collaboration across different organisational functions and disciplines, enabling teams to work together more effectively on innovation projects.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

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