# Knowledge Management (LMX as The Enabler and Knowledge Creation as the Process) to Innovative Behaviour in Public Sector

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**Abstract.** This study examines the relationship between knowledge management and innovative behavior in public sector. Since information and communication technology and pandemic covid-19 that have been widely exposed, knowledge management becomes an important issue. Public sector has different challenges and characteristics from the private sector. The main challenge in public sector is productivity because public sectors are often considered not yet focused on addressing various social, economic, and environmental problems. While the characteristic of public sector tends to be complex because public sector has to deal with various stakeholders, sometimes these stakeholders have different interests. Public sector needs to respond those challenges through an effective knowledge management system. Knowledge management can be realized effectively when the enabler and the process of knowledge management run effectively as well. This study uses Leader-Member Exchange (LMX) as the enabler and knowledge creation as the process of knowledge management. Structure model will show that LMX has positive and significant relationship to innovative behavior in public sector, if mediated by the role of knowledge creation. This quantitative research is tested from 110 employees who work in public sector, and the result indicates that LMX has a positive and significant relationship to innovative behavior if mediated by knowledge creation. This proves that innovative behavior in public sector can be realized effectively, if the public sector has effectively organized knowledge management as well.

**Keywords:** Innovative Behavior, Knowledge Management, Leader-Member Exchange, Knowledge Creation, Public Sector

## 1 Introduction

This study explains the influence of knowledge management to increase employee's innovative behavior in public sector. Recently, knowledge management and innovative behavior become a big issue for the organization. The development of technology and information in this digital era as well as the covid-19 pandemic, has brought organization to face VUCA (volatility, uncertainty, complexity, and ambiguity) condition [1]. To deal with this, both private and public sector are required to be able to do some adjustment of new working systems. However public sector has specific challenges and quite complex characteristic, public sector is not considered yet focused on addressing various social, economic, and environmental problems [2]. And public sector has to deal with some stakeholders, somehow every single stakeholder has a single different interest too [3].

To do some adjustment of new working systems, public sector must be familiar with innovation because innovation is driver of change. Damanpour [4] defines innovation as means to change the organization, both in order to respond the external environment and in order as a preventive measure to affect the environment. There are at least three main reasons why public sector needs to innovate: (1) The role of public sector is quite large in the national Gross Domestic Product (GDP); (2) Public sector needs to develop policies that are relevant to current economic developments; and (3) Public sector is precisely the stipulations of various innovation rules in the private sector [5].

Innovation is generated by new ideas from individuals in the organization. It causes that innovation can be realized when individuals in the organization having innovative behavior [6]. West and Farr [7] have defined innovative behavior as the creation, introduction, and application of a new idea in order to improve organizational performance. Farr and Ford [8] have defined innovative behavior as individual behavior in order to achieve initiation and recognize a new idea, process, or product that can benefit the organization. Innovative behavior is also defined as an act of investigation of individuals in generating, recognizing, and applying a novelty [9]. In previous studies, knowledge management is often used as a key factor of innovation, where knowledge management can create the sustainable innovation [10]. Furthermore, to support employee's innovative behavior can be realized, organization needs to organize knowledge management effectively. It supports the question for this study on how is relationship of knowledge management to innovative behavior in public sector.

According to Davenport et al. [11] knowledge management is closely related to the exploitation and development of knowledge in order to achieve organizational goals. The objectives of knowledge management include: (1) To create the knowledge storage, which this storage can be classified into three forms including external, structured internal, and informal internal knowledge storage; (2) To improve the access of information and to facilitate the process of knowledge sharing where individual can easily to get and to give some information for others; (3) To improve the knowledge culture (the culture that organization really appreciate, respect, and implement the knowledge system); and (4) To manage knowledge as the valuable asset, as we know knowledge is a huge asset than a real asset itself.

Knowledge is a resource that is part of the core competency and the main strength of an organization in order to be superior [12]. Knowledge that needs to be developed in explicit or tacit, in which to develop knowledge requires a process of identification, creation, and knowledge sharing. Explicit knowledge is a knowledge that has been successfully documented, both in the form of physical documents and electronic documents, while tacit knowledge is knowledge that is inherent in the individual that is not easy to be described and shared, this knowledge is usually obtained through the process of interaction and communication with other people [13].

Knowledge management is a holistic system, Lee and Choi [14] suggest that knowledge management requires knowledge enablers and knowledge process factors in order to improve organizational performance. Knowledge enabler is a factor that influences the organization to encourage knowledge consistently. Knowledge enablers can affect the knowledge management process quickly, meanwhile the knowledge process is associated with creating, acquiring, storing, sharing, and utilizing the knowledge [15]. One of enabler in knowledge management system is leader-member exchange (LMX). Saeed et al. [16] stated that employees who can interact well with their superiors will have better competencies in creating, sharing, and utilizing knowledge. Based on previous research, Iqbal et al. [17] include leadership, culture, and incentives as knowledge enablers, while the knowledge process consists of knowledge acquisition, knowledge sharing, and knowledge utilization.

Sahibzada et al. [15] include trust and organizational climate as knowledge enablers, and the knowledge process consists of knowledge creation, knowledge acquisition, knowledge storage, knowledge sharing, and knowledge utilization.

In this study, researcher consider leader-member exchange (LMX) as knowledge enabler because researcher assume knowledge is individual driven where it can be influenced by leadership and LMX [18]. And for knowledge process, researcher use knowledge creation because researcher believe process of creation needs a comprehensive process through socialization, externalization, combination, and internalization [13].

LMX describes the relationship from time to time between superiors and subordinates. The quality of the relationship between superiors and subordinates (LMX) can be classified into two categories: (1) High LMX quality (in-group), superiors and subordinates have a good relationship. Subordinates will consequently do a good job and they will do some extra activities even that may not be part of their duties. However, superiors will voluntarily exchange some resources such as information, support, and attention; (2) Low LMX quality (out-group), superiors and subordinates have a low relationship. Subordinates will commonly do some regular tasks only, without extra effort for their respective duties. And superiors will treat their subordinates formally [19].

Dienesch and Liden [20] suggest that LMX has four dimensions which include: (1) The contribution dimension, where superiors and subordinates have the same perception of an amount, direction, and quality of work; (2) Loyalty dimension, where superiors and subordinates have loyalty and support each other; (3) Affective dimension, where superiors and subordinates have mutual respect or have good interpersonal attraction; and (4) The dimension of professional respect, where superiors and subordinates can respect each other if each other has a good reputation in carrying out work.

Tse and Mitchell [21] reveal that LMX is predicted to have a positive and significant relationship to knowledge creation if the size of the organization is small. However, from the results of their research, Tse and Mitchell [21] have not unable to test relationship between LMX and knowledge creation. On the other hand, there is an empirical research by Song et al. [22] which illustrates that transformational leadership (good leadership character) can increase knowledge creation. In addition, Abdulmuhsin et al. [23] also illustrates that leader who has bad behavior (like to exploit their subordinates) can have a bad impact on knowledge creation. It supports research hypothesis:

H1: LMX has positive and significant relationship to knowledge creation.

Knowledge creation can be interpreted as a series of activities to produce, acquire, create, and develop new knowledge. Knowledge creation is used to develop existing knowledge to be better, then that new knowledge can increase competitive advantage for the organization [23]. Nonaka and Teece [13] reveal that there are three fundamental issues in knowledge creation which include: (1) Organization needs to do knowledge conversion process from socialization, externalization, combination, and internalization (SECI). Socialization is conducted through collecting some tacit knowledges (from tacit to tacit). Externalization is conducted through providing a dialogue for the entities of the organization (from tacit to explicit). Combination is conducted through collecting some sources of information, both data or documents from internal and external organizations (from explicit to explicit). And internalization is conducted through providing prototypes of new knowledge that can be used by organizational entities (from explicit to tacit); (2) Organization needs to have a "ba" as a place to exchange the information. Ba can be a place to interact between individuals to other individuals, or a place

to interact between individuals to the community directly, or a place to interact virtually; (3) Organization needs to manage knowledge as an asset.

Sarwat and Abbas [24] also stated that knowledge creation is able to encourage organization to improve their ability to apply innovation, where innovation is needed by employees who have innovative behavior (behavior that is able to recognize, create, and implement some new ideas).

H2: Knowledge creation has positive and significant relationship to innovative behavior

This research is expected to contribute, refer, and increase the enthusiasm of public sector in knowledge management. So that public sector can increasingly concern to increase the employee's innovative behavior. Moreover, it becomes highly important during development of technology and information in this digital era as well as the covid-19 pandemic, where public sector was not very familiar with the future working systems.

## 2 Method

This research started from identifying issues that arise due to the development of information and communication technology and covid-19 pandemic. The object of this research related to discussion of how to overcome those issues that impact VUCA condition. Innovation is an option solution. Where to create innovation, the organization is required to facilitate the increasing of employee's innovative behavior. Literature study is conducted to seek some references from previous studies that have discussed innovative behavior in the organization. Some studies stated that knowledge management systems are able to increase employee's innovative behavior.

Further step, researcher make research model that connects the knowledge management system to innovative behavior. This research model has adopted from previous research that conducted by Iqbal et al. [17], its model describes the relationship of knowledge management to organizational performance. Knowledge management is described in two parts, which include knowledge enablers and knowledge processes. The results of their research show that knowledge management can have a direct relationship to organizational performance or can be mediated by innovation and intellectual capital.



**Fig 1.** Research Model

After the concept of research model was compiled, researcher then conducted pretest survey, where we distributed pretest questionnaire through the google form application. From respondent feedback, we can see their perception by analyzing the validity and the reliability test. After the trial phase was declared valid and reliable, further step researcher conducted data collection on respondents who work in public sectors. Data collection was carried out in the same way when pretest questionnaire was distributed, using the google form application. After data collection was done, all data that had been collected, were processed and analyzed by researcher.

Variable operationalization is a parameter that will be stated in questionnaire in explaining the variables that have been set in the research model. The variables in this study consist of independent variable (innovative behavior), dependent variable (LMX), and mediator (knowledge creation). LMX is relationship between superiors and subordinates, which is measured using four dimensions including contribution, loyalty, affection, and professional respect. The measurement of this variable adopts a questionnaire that has been developed by Liden and Maslyn [25]. LMX will be measured with six Likert Scales from Strongly Disagree to Strongly Agree.

Knowledge creation can be a factor in knowledge management process, such as the research conducted by Sahibzada [15] and Abdulmuhsin [23]. The knowledge creation questionnaire in this study is adopted from the research of Lee et al. [26], where knowledge creation was measured using two dimensions, task understandings and information understandings. Knowledge creation will be measured with six Likert Scales from Strongly Disagree to Strongly Agree. In previous studies there were many instruments used to measure innovative behavior such as Scott and Bruce (1994 and 1998), Janssen (2000), and Kleysen and Street [9]. Meanwhile, the questionnaire used to measure the innovative behavior variable in this study was adopted from the research of Kleysen and Street [9]. Innovative behavior will be measured by a six Likert Scale from Strongly Disagree to Strongly Agree.

Structural model test is used to assess research model, has it been matched with sample or not. After research model has been estimated, then a comparison of model fit is carried out. Model fit is conducted by comparing theory with reality through an assessment of the similarity of estimated covariance matrix (theory) with the observed covariance matrix (reality). If the theory is perfect, then the observed and predicted covariance matrix will be the same. The value of each measurement of Goodness of Fit (GoF) is generated from a mathematical comparison of the two metrices. If the value of that two metrices are closer so that the model is good, or it can be said the model is appropriate. In this study, three types of GoF will be used which include absolute fit measures, incremental measures, and parsimony fit measures. The following is the standard value for testing the fit of the model using the three types of GoF.

In this study, hypothesis test will use the Structural Equation Model (SEM) which is assisted in calculations with Lisrel software. Hypothesis is tested in one-tailed (one-way) method, which means that this study only draws true and false conclusion. The hypothesis can be accepted if the t-value is more than 1.645, otherwise if the t-value is less than 1.645, the hypothesis is not supported. In this study, knowledge creation variable has a role as a mediator that mediates relationship between the independent variable (LMX) to dependent variable (innovative behavior). The indirect effect test is conducted by looking at the mediation category from the study of Zhao et al. [27].

Zhao et al. [27] stated that mediator test can be classified into five types consisting of three types of mediation and two types of non-mediation. The three types of mediation include: (1) Complementary mediation, where the mediating effect (a x b) and direct effect (c) occur and show the same direction; (2) Competitive mediation, where the mediation effect (a x b) and direct effect (c) occur and show different directions; (3) Indirect-only mediation, where the mediating effect (a x b) occurs but the direct effect (c) does not occur. While the two types of non-mediation include: (4) Direct only nonmediation, a direct effect (c) occurs, but there is no indirect effect; and (5) No-effect nonmediation, indirect effects and direct effects do not occur.

# 3 Result and Discussion

To determine validity and reliability of research instrument, researcher distributed pretest questionnaires to 30 respondents. The characteristics of pretest respondents are similar to the characteristics of research object. Hair et al. [28] stated that variable/dimension can be valid if Kaiser Meyer-Olkin Measures of Sampling Adequacy (KMO-MSA) value is ≥ 0,5 and component matrix value is ≥ 0,5. Meanwhile, Malhotra et al. [29] stated that variable/dimension can be valid if cronbach's alpha value is ≥ 0,6. By using IBM SPSS Statistics 25 software, we can see the result that research instrument is valid and reliable, and researcher take the further step which is main test.

Main test has taken from 110 respondents who work for public sector. Respondents consist of 68 men and 42 women, with the most age is 31 – 40 years old (64%). Their education levels are mostly bachelor (43%) and diploma (43%), and others are postgraduate (11%) and high school (3%). And their working period is mostly more than 11 years (55,5%), less than 6 years (26%), and other is between 6 – 10 years (18,5%). If we see from their working period, we can assume that they should be related and they should be engaged with the organization.

To assess research model (model that has been built, has matched with sample or good fit), researcher uses structural model test. This test is carried out on the overall model, where this model has previously been tested for validity and reliability and has been declared eligible for further analysis. The result of structural model test shows:

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                    Goodness of Fit Statistics

                      Degrees of Freedom = 142
           Minimum Fit Function Chi-Square = 233.84 (P = 0.00)
 Normal Theory Weighted Least Squares Chi-Square = 219.02 (P = 0.00)
           Estimated Non-centrality Parameter (NCP) = 77.02
      90 Percent Confidence Interval for NCP = (40.92 ; 121.07)

                  Minimum Fit Function Value = 2.15
         Population Discrepancy Function Value (F0) = 0.71
        90 Percent Confidence Interval for F0 = (0.38 ; 1.11)
     Root Mean Square Error of Approximation (RMSEA) = 0.071
      90 Percent Confidence Interval for RMSEA = (0.051 ; 0.088)
         P-Value for Test of Close Fit (RMSEA < 0.05) = 0.040

             Expected Cross-Validation Index (ECVI) = 2.89
       90 Percent Confidence Interval for ECVI = (2.56 ; 3.29)
                  ECVI for Saturated Model = 3.49
                ECVI for Independence Model = 37.10

Chi-Square for Independence Model with 171 Degrees of Freedom = 4005.62
                    Independence AIC = 4043.62
                        Model AIC = 315.02
                      Saturated AIC = 380.00
                   Independence CAIC = 4113.93
                       Model CAIC = 492.64
                     Saturated CAIC = 1083.09

                   Normed Fit Index (NFI) = 0.94
                 Non-Normed Fit Index (NNFI) = 0.97
             Parsimony Normed Fit Index (PNFI) = 0.78
                 Comparative Fit Index (CFI) = 0.98
                 Incremental Fit Index (IFI) = 0.98
                  Relative Fit Index (RFI) = 0.93

                      Critical N (CN) = 86.82

                Root Mean Square Residual (RMR) = 0.054
                      Standardized RMR = 0.068
                  Goodness of Fit Index (GFI) = 0.83
             Adjusted Goodness of Fit Index (AGFI) = 0.77
             Parsimony Goodness of Fit Index (PGFI) = 0.62
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Based on that result, it can be seen that the criteria of RMSEA, ECVI, NFI, NFI, CFI, IFI, and RFI are good fit category. So, it can be said that the model used in this study is feasible and good and it consequently stated that this research model can describe the real condition.

Hypothesis is tested to see relationship both LMX to knowledge creation (H1) and knowledge creation to innovative behavior (H2). The result of hypothesis shows as figure 2 and figure 3.
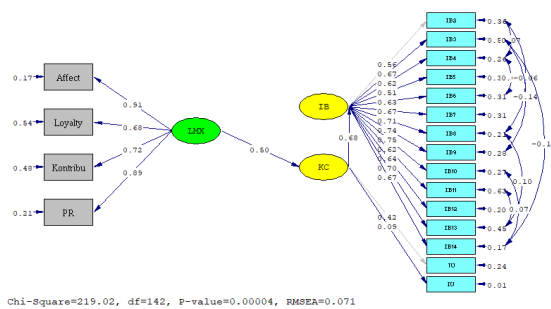


**Fig 2.** Relationship both LMX to knowledge creation (H1)
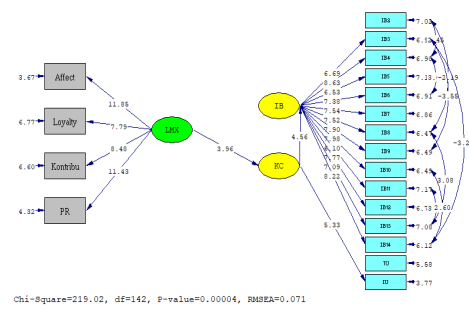


**Fig 3.** knowledge creation to innovative behavior (H2)

Based on the results on the path, it can be seen that the t-value from LMX to Knowledge Creation (KC) is 3,96. This t-value is greater than the significant level value of 1.645, which it indicates that the LMX variable has significant effect on knowledge creation. The SLF value of 0,50 indicates that the LMX variable has a positive effect of 0.50 on the KC variable. The result concludes that hypothesis 1 is supported, and the result is in line with the predictions of research conducted by Tse and Mitchell [21]. The path that connects KC variable with innovative behavior (IB) variable has a t-value of 4,56 because the t-value is greater than the significant level, it indicates that KC variable has significant effect on IB variable. The SLF value of 0,68 indicates that the LMX variable has a positive effect on the KC variable. This result concludes that hypothesis 2 is supported, and the result is in line with the predictions of research conducted by Chou and Walker-Price [30].

As we can see that LMX and knowledge creation have significant and positive effect, and also knowledge creation to innovative behavior has significant and positive effect. In this study, we can see that knowledge creation has the mediator role of relationship between LMX to innovative behavior. This indirect effect test is conducted by looking at the mediation category from the study of Zhao et al. [27]. Based on the results of the indirect effect of LMX to IB, it shows that KC variable can moderate LMX variable with innovative behavior variable. This is shown because each path that connects both LMX to KC or KC to IB has a t-value that is greater than the significant level. It supports and concludes that KC variable can moderate the LMX to innovative behavior.

# 4  Conclusion

Based on the objective in this study, to determine the relationship between knowledge management and innovative behavior in public sector, it can be concluded from the results of this study as follows:

a) Leader-Member Exchange (LMX) is an enabler factor that is proven to directly have a positive and significant influence on knowledge creation as one of the factors that can process knowledge. Thus, a good relationship between superiors and subordinates can improve the process of creating new knowledge in public sector.

b) Knowledge creation is the process factor that is proven to directly have a positive and significant influence on innovative behavior. Thus, the creation of knowledge can increase employee's innovative behavior in the environment of public sector.

c) Knowledge creation is proven to fully mediate the relationship between Leader-Member Exchange (LMX) and innovative behavior. Thus, a good relationship between superiors and subordinates can increase employee's innovative behavior if employees can create knowledge in a public sector.

From the results, it is known that the leader-member exchange (LMX) is proven to have a great influence on the creation of knowledge and innovative behavior in public sector. It implies that organization is expected to play an active role in fostering relationships between superiors and subordinates in order to support the creation of useful knowledge for the organization. However, this research has the limitation such as (1) a number of sample is only 110 respondents, (2) the questionnaire was filled out using the self-administered questionnaire method, where this method is known to have the weaknesses in interpreting the questions which can lead to misinterpretation so that it can provide biased answers from respondents who fill out the questionnaire, (3) limited data collection process due to the covid-19 pandemic which makes access to companies limited.

## 4.1  Funding

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