

# **Digital Transformation and Knowledge Sharing in Public Organizations: An Empirical Evidence from Vietnam**

**Nguyen Van DU**

University of Economics Ho Chi Minh City

*Email: dunv@ueh.edu.vn*

## **Abstract**

*This research aims to identify and measure the factors affecting knowledge-sharing behaviour in the digital transformation process of officials in public organizations. The sample size of 289 Vietnamese officials has been surveyed for this research. There are 6 hypotheses raised and the author used a linear regression model to test them. The research results provided evidence for the effects of social trust, information systems, working time, expected association, and leadership on the knowledge-sharing behavior. Besides contributing to knowledge-sharing literature, this research proposes main managerial implications of promoting knowledge sharing behavior of officials in public organizations in Vietnam.*

**Keywords:** Digital transformation, Knowledge sharing, Leadership, Public services, Vietnam.

## Introduction

Recently, digital transformation (DT) appears to be changing the production and business methods of enterprises as well as changes in the service provision of public organizations. Digital transformation offers economic and management efficiency, especially transparency in public administrative services (Ana Alvarenga *et al.*, 2020). In the era of technology, almost all organizations analyze and study the benefits and take necessary steps to apply new technologies, including DT, to their operations (Matt *et al.*, 2015). The rapid changes in technology have led to changes in people's habits of using public services. Technology knowledge and application in management activities bring competitive advantages to countries (Antonelli and Feder, 2020). According to Mergel *et al.* (2019), digital transformation occurs in the public sector when organizations realize the pressures from inside and outside the organization. Due to the benefits brought, DT is becoming a trend and receiving the priority of governments in many countries worldwide. In Vietnam, the National digital transformation program has been approved by the Prime Minister in Decision No. 747/QĐ TTg, according to which, by 2030, Vietnam will achieve the goal of developing a digital government, digital economy and digital society.

DT in the public sector is not only about equipping technology, infrastructure and application software but also about working processes, cultural factors, the performance capacity of stakeholders and legal synchronization (Haug *et al.*, 2019). In particular, for the DT process to be successful, it is necessary to have the participation of public officers who are exploiting and contributing ideas to improve the solutions of the total digitization system. Because of different technological capabilities, in exploiting the digital transformation system, there is necessary for help and knowledge sharing among public officers using the new system. This is one of the difficulties and challenges of public organizations because knowledge is an individual property, it has value and when knowledge is shared, it becomes public goods. If the knowledge owners want to create their own power, they limit knowledge sharing (Davenport, 1997) and this mindset is a barrier to knowledge sharing (Riege, 2005). Knowledge is an important resource, creating competitive advantages and sustainable development for organizations and countries (Kogut and Zander, 1992; Beijerse, 1999). Because knowledge has an important role, in contributing to the success of organizations, it is necessary to manage knowledge in the most effective way (Suppial and Sandhu, 2011; Ana Alvarenga *et al.*, 2020). Therefore, in the knowledge management system, the organizations and the leaders should encourage their subordinates to share personal knowledge with their colleagues (Hansen and Avital, 2005). The organizations often build organizational culture towards creating trust among employees, enhancing communication, information exchange, and having a clear reward mechanism to promote knowledge sharing. (Gupta and Govindarajan, 2000).

The general objective of this research is to identify and measure the impacts of factors on the knowledge sharing behavior of officers at public organizations that are undergoing digital transformation. To achieve the above objective, in this research context, we focus on answering the following questions: (1) What are the factors that influence knowledge sharing? (2) How much is the influence of each factor on knowledge-sharing behavior?; and (3) Which governance implications need to be taken to make knowledge sharing in public organizations effective?

Key contents and structure of this study are as follows. Theory, hypotheses and research models are provided in the next section. In following section of Results and discussion, the author will present the statistical results and some tests about fitness of models before presenting the regression results. Finally, based on the regression results, the author will give conclusions and

provides key policy implications to improve the efficiency of digital transformation in the public sector in Vietnam.

### 1. Main theoretical issues, hypothesis and research model

Knowledge includes information, understanding about an object, phenomenon and the relationships between them that a person needs to have in order to perform his or her duties (Storey and Goldstein, 1993). Knowledge is a collection of experiences and skills that individuals acquire through learning, seeking, and combining to perform tasks and create new experiences (Davenport and Prusak, 1998).

Knowledge sharing is a subjective process that spreads knowledge to many others (Lee and Al-Hawamdeh, 2002). Knowledge sharing among individuals in a workgroup allows them to enhance the competence of each member through a synergistic effect (Jonassen *et al.*, 1995), which improves individual performance and improve team performance (Cheng and Li, 2011). Knowledge sharing helps connect employees with their organization, helping the organization achieve sustainable success (Davenport and Prusak, 1998). For decades, knowledge sharing has become a popular topic of interest to many managers and researchers (Liao *et al.*, 2013).

Social exchange theory is about social interactions in which individuals believe they will derive certain benefits from exchange behaviors (Blau, 1964). Social exchange theory is commonly used to explain knowledge-sharing behavior (Bock, 2005). So, the core of this theory deals with the interactions and decisions of individuals in society based on the value they derive from knowledge sharing. Individuals will engage in knowledge sharing behavior if they believe they gain certain benefits from this behavior. Conversely, they will not perform if knowledge sharing brings losses.

Social trust is important for successful knowledge sharing. In working and studying, employees develop and accumulate their skills through cooperation with more skilled colleagues. Social trust, such as trust in colleagues refers to the degree that an individual is persuaded to follow the actions of others and is a factor that positively affects the exchange and knowledge sharing (Chow and Chan, 2008).

#### ***H1: Social trust (ST) positively affects knowledge sharing.***

Information brings understanding and awareness to people. Information technology and communication are closely related to knowledge sharing because these have helped create a favorable environment for cooperation and information exchange among employees in the organization (Huysman and Wulf, 2006). The work and profession of civil servants in the public sector are quite complicated. It is necessary to refer to many legal documents in the document system or to refer from colleagues. A good information system and good data exchange environment will help promote knowledge-sharing behavior.

#### ***H2: Information systems (IS) positively affect knowledge sharing.***

When an organization has the right workload, they feel comfortable in their work and spend time talking to their colleagues about new ideas (Pooja *et al.*, 2016). The reasonable working time will motivate employees to seek and share knowledge, promoting creative activities from which their organizations can benefit (Altaf and Awan, 2011). On the contrary, when overloaded by time pressure, employees are worried about not completing the task because the search and innovation are not successful, so they limit their creative behaviors, search, and knowledge sharing (Avery *et al.*, 2010; Hobfoll, 2001). Recently, many officials working in Vietnam have had to do other jobs concurrently.

**H3: Working time (WT) is limited, work overload will prevent knowledge sharing.**

For knowledge-sharing behavior to occur, the sharers must first be confident in their knowledge, believing that sharing is successful and useful (Ford, 2003). Confidence is the heart of knowledge exchange (Davenport and Prusak, 1998) and as confidence increases, so does the behavior of knowledge sharing (Anderson and Narus, 1990). In the DT process, many new technology solutions are put into use; many processes and procedures have to change, so officials need to master to perform their duties and share with colleagues.

**H4: Confidence in personal knowledge (CP) is positively related to knowledge sharing.**

Expected associations to build rapport is the degree to which a person believes that he or she can improve relationships with others by knowledge sharing (Wasko and Faraj, 2005). The work of officials has vertical and horizontal correlation, so in public organizations, officials tend to build relationships with their colleagues.

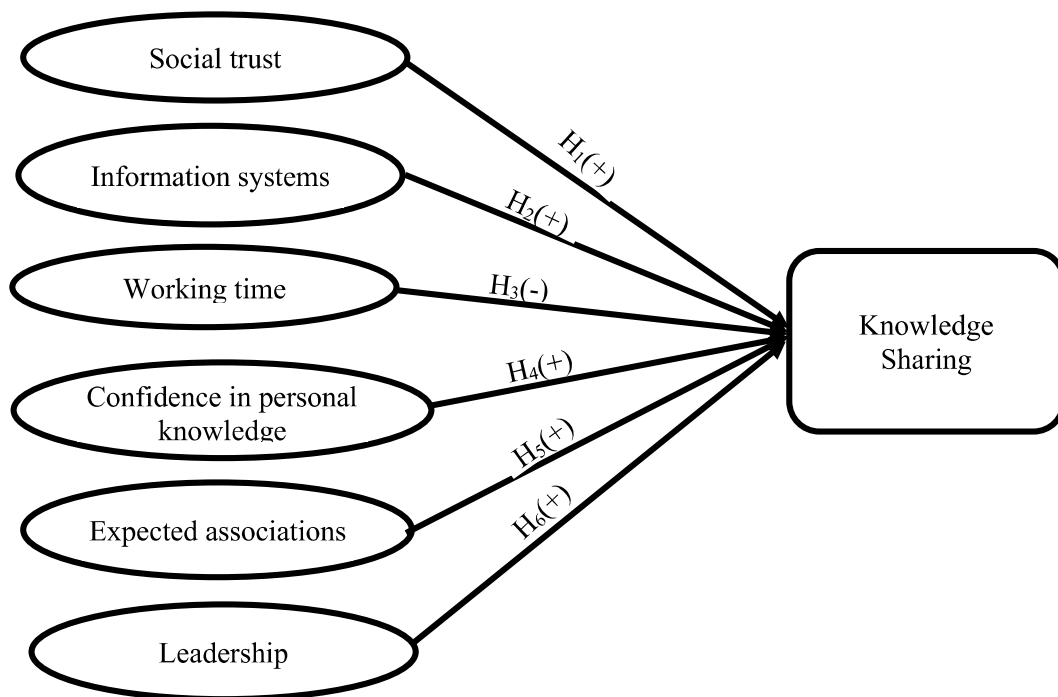
**H5: Expected associations (EA) positively impact knowledge sharing.**

Leadership is important in creating the working environment and atmosphere (Grandori and Kogut, 2002; Hendriks, 1999; McDermott and O'Dell, 2001). The role of leadership in organizing coaching, training, encouraging sharing, etc. has a positive influence on knowledge sharing (Goh 2002; Chourides, 2003). Although there are many different leadership styles, those influence knowledge sharing through mentoring or facilitating effective knowledge sharing (Cameron and Quinn, 1999). The DT process has many challenges and pressures because of applying new solutions, changing work process, etc... so the officials need to study on their own in order to adapt with the new one. The attention and encouragement of leaders are very necessary because it helps create the motivate officials to overcome difficulties and challenges to apply DT solutions at their office.

**H6: Leadership (LD) has a positive influence on knowledge sharing.**

With the hypotheses discussed, in this study, the author proposes the following research model (Figure 1).

**Figure 1: Proposed research model**



## 2. Research methods

The author used quantitative method and conducted it in two phases: preliminary and formal research. Preliminary research will conduct group discussions to adjust the research model and adjust the scales to suit reality. Formal research will collect data first then clean data and scale reliability analysis (Cronbach's Alpha); Exploratory factor analysis (EFA) and regression analysis. There are 24 scales of measurement for 6 independent factors and 4 scales for a dependent factor. These are Likert scales, 5 levels inherited from previous research (see Appendix A).

The sample size is influenced by many factors including the purpose of the study, all of the study sample, the sampling error allowed, *etc.* (Israel, 1992). In this study, with the limitations of cost, time, and survey information, the sample size will be taken at the necessary level. According to Hair, Black, Babin, and Anderson (2009), the EFA technique suggests a minimum sample size of 5 times the total number of observed variables.

Respondents are officials working in the public sector, at the provincial, district and commune levels of Ho Chi Minh City, Tien Giang, and Long An province. The chosen sampling method is convenience sampling. There were 396 participants answering the survey. The data cleaning process removed 80 samples, thus, the number of samples included in the analysis was 289.

## 3. Results and discussion

Cronbach's Alpha coefficient assesses the items' reliability for a factor. This coefficient has a variable value in the range [0,1], a good value if it is 0.7 or higher, however, as a preliminary exploratory study, the Cronbach's Alpha of 0.6 is acceptable received (Hair *et al.*, 2009). Another important indicator is Corrected Item-Total Correlation. This value represents the correlation between each item with the remaining items in the same factor. Also, according to Hair *et al.* (2009), the Corrected Item-Total Correlation value must be from 0.3 or higher. On the contrary, if its value is less than 0.3, this Item should be removed.

The results of the Cronbach's Alpha reliability test of the factors ranged from 0.639 to 0.814. The Corrected Item-Total Correlation of Items is more significant than 0.3. Thus, there are 24 items that belong to 6 factors of independent variables and 4 that belong to a dependent variable eligible to conduct EFA. However, Cronbach's Alpha coefficient is quite small, most of them are just acceptable received level (Appendix B).

**Table 1: The results of the reliability analysis of the scale**

Factors	Number of items	Cronbach's Alpha	Corrected Item-Total Correlation minimum
Social trust (ST)	3	0.669	0.403
Information systems (IS)	4	0.690	0.450
Working time (WT)	4	0.814	0.615
Confidence in personal knowledge (CP)	3	0.755	0.531
Expected associations (EA)	5	0.642	0.331
Leadership (LD)	5	0.639	0.363
Knowledge sharing (KS)	4	0.645	0.414

EFA analysis aims to evaluate the convergence and discrimination of the scales, allowing to reduce the  $k$  scales of converging observations to  $F$  factors ( $F < k$ ). According to Hair *et al.* (1998), the EFA analysis need to consider: (1) KMO coefficient (Kaiser-Meyer-Olkin) is used to consider the appropriateness of factor analysis. The value of KMO must reach 0.5 or more ( $0.5 \leq \text{KMO} \leq 1$ ), which is a sufficient condition for factor analysis to be appropriate. If this value is less than 0.5, then factor analysis is not suitable for this data set; (2) Bartlett Test is used to check whether the observed variables in the factor are correlated with each other or not. This is related to the convergence value in the EFA analysis. It has statistical significance when sig Bartlett's Test  $< 0.05$ , showing that the observed variables are correlated with each other; (3) Total Variance Explained  $\geq 50\%$  indicates that the EFA model is appropriate. This value represents the percentage variation of the observed variable; and (4) Factor Loading indicates the relationship between the observed variable and the factor. The higher the factor loading coefficient the greater the correlation between that observed variable and the factor and *vice versa*. At least, the value of the factor loading coefficient is 0.3 and a coefficient of 0.5 or above will be the most suitable threshold. However, the factor loading coefficient should be considered along with the sample size of the research.

In this research, the factor loading coefficient corresponding with 289 samples is set up at 0.35. Using Varimax rotation, detect 2 items converging in 2 groups, namely LD2 and CP2. Due to the difference in factor loading of item LD2  $< 0.2$  ( $0.432 - 0.383 < 0.2$ ), it is disqualified. In the second rotation, the item CP2 still converges in the 2 groups, but the difference in the factor loading between the 2 groups is greater than 0.2 ( $0.693 - 0.414 > 0.2$ ), so this item is not eliminated. After two Varimax rotations, the results show that test coefficients meet the requirements, including: (1) KMO = 0.767 ( $> 0.5$ ); (2) The sig of Bartlett's Test is 0.000 ( $< 0.005$ ); (3) Total Variance Explained is 55.899% ( $> 50\%$ ); and (4) 23 items belong to 6 independent factors and 4 Items that belong to dependent factor. With satisfactory analysis results, next quantitative targeting steps will be done (Appendix C).

Next, the Ordinary Least Square (OLS) regression method is used to test the research hypothesis and measure each factor's impact on knowledge-sharing behaviour. The regression output is list in Appendix D with some main results as follows: (1) Adjusted  $R^2$  value is 0.235, this means that independent factors only explain 23.5% of the change in knowledge sharing behavior. The other factors explain the rest; (2) F-test with hypothesis  $H_0: R^2 = 0$  is used to consider the goodness of fit of the regression model. The ANOVA analysis table shows the value:  $F_{(ANOVA)} = 15.68$  and Sig = 0.000. Since Sig  $< 0.05$  so hypothesis  $H_0$  is rejected. This means that  $R^2 \neq 0$ , statistically significant and the regression model is fits; and (3) Histogram has a distribution in the form of a bell, the Mean value is close to 0 (Mean =  $3.20E-15$ ), the standard deviation of Std.Dev is close to 1 (Std.Dev = 0.989). In addition, the Normal P-P Plot shows the data in the distribution of residuals close to the diagonal. Thus, the hypothesis that the residuals follow a normal distribution is not violated. The results of testing 6 research hypotheses, checking the multicollinearity and measuring the impact of each factor on knowledge sharing behavior are described in Table 2.

**Table 2: Multiple regression results with dependent variable KS**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.734	.266		6.519	.000		
ST	.088	.040	.122	2.180	.030	.850	1.177
WT	-.102	.047	-.139	-2.160	.032	.645	1.551
IS	.075	.032	.123	2.325	.021	.961	1.041
CP	.029	.049	.038	.597	.551	.661	1.513
EA	.245	.051	.285	4.841	.000	.772	1.296
LD	.226	.052	.248	4.316	.000	.810	1.235

The output shows that hypothesis H<sub>4</sub> (*Confidence in personal knowledge is positively related to knowledge sharing*) is rejected. The remaining hypotheses are accepted at the 5% significance level. The VIF of factors are all less than 2, which means that the model does not have multicollinearity. The normalized regression function is rewritten as follows:

$$KS=0.122ST-0.139WT+0.123IS+0.285EA+0.248LD+\epsilon$$

After removing the CP factor, the regression model recorded the impact of 5 factors on KS, in which the strongest effect is EA ( $\beta=0.285$ ), followed by the effect of LD ( $\beta=0.248$ ), etc. As the hypothesis stated, busy working time hinders knowledge sharing, so the effect of WT is negative ( $\beta=-0.139$ ).

#### 4. Conclusions and managerial implications

The research initially provides evidence on some factors' effect on the knowledge sharing of officials in the public sectors in the digital transformation process. Based on the research results, the author offers some managerial implications to promote knowledge sharing behavior as follows:

The sense of building the relationship has the strongest impact, according to which, in the condition that other factors remain constant. When the average of the items that belong to factor EA increases by 1 unit, the behavior of sharing knowledge will increase by 0.285 unit. The public sector has many relationships with other departments, so to deal with work smoothly, officials always have a sense of building relationships. Public organizations need to strengthen exchange activities, both inside and outside the organization, to promote knowledge sharing. This, in turn will make officials have a closer bond, thus, knowledge sharing will be more convenient.

Leadership has an important role in knowledge sharing. Among the 5 influencing factors, the level impact level of LD is the second ( $\beta=0.248$ ). In organizations, the role of leaders is very important because they influence the working environment and culture of the organization. In the DT process, the role of leaders becomes more important because they are the ones who make choices about the application of strategies, processes and solutions to the DT process. For this research field, on an individual level, leaders need to be an example in learning and sharing knowledge. DT process needs to apply new technical skills, so leaders also need mechanisms to encourage, motivate and create a learning environment in the organization. In addition, leaders

also need a reasonable mechanism to empower employees to help them take the initiative in their work, but still ensure efficiency and responsibility for the assigned tasks.

During DT process, officials need to learn and practice new applications and work processes proficiently to form skills and knowledge for themselves as well as to share with colleagues. The process of learning to know and come to proficient use takes time. As well as the research results, the negative correlation coefficient ( $\beta=-0.139$ ). When the officials are too busy with their work, they will limit their knowledge sharing because of work pressure, stress to complete tasks and fear of unsuccessful attempts to find new ones. To limit this, public organizations need to arrange reasonable work, have appropriate policies for officials to participate in training sessions, and build professional support groups when implementing new programs and solutions in the DT process.

Although the impact is not large, both factors ST ( $\beta=0.122$ ) and IS ( $\beta=0.123$ ) have a positive relationship with knowledge sharing. In order to build social trust with colleagues, each individual needs to regularly exchange, be willing to share their knowledge, and at the same time need to have a sense of learning from their colleagues. To improve this, organizations need to not only encourage, motivate and build a learning culture, but also build a complete and convenient information system for exchanging and sharing knowledge of their officials.

#### *The study's limitations*

This research only examines the influence of factors on knowledge sharing of officials in the digital transformation process. In fact, the digital transformation process also has many participants such as experts in developing solutions, leaders in developing strategies and service users. In addition, the convenience sampling method is also a limitation because the nature of the work, the infrastructure system, and the service characteristics at each level are different. It is suggested that the next research direction needs to be discussed with stakeholders such as system building experts, strategic choice leaders, service users and need to approach the method of collecting information and stratified sample according to each working level, city, district/district or ward/commune.

#### **Reference**

- Al-Alawi A. I., Al-Marzooqi N. Y. and Mohammed Y. F. (2007). "Organizational culture and knowledge sharing: critical success factors", *Journal of knowledge management*, Vol. 11, No. 2.
- Altaf A. and Awan M.A. (2011). "Moderating effect of workplace spirituality on the relationship of job overload and job satisfaction", *Journal of Business Ethics*, Vol. 104 No. 1.
- Anderson J.C. and Narus, J.A. (1990). "A model of distributor firm and manufacturer firm working partnerships", *Journal of Marketing*, Vol. 54, No. 1, pp.42-58.
- Avery, D.R., Tonidandel, S., Volpone, S.D. and Raghuram, A. (2010). "Overworked in America? How work hours, immigrant status, and interpersonal justice affect perceived work overload", *Journal of Managerial Psychology*, Vol. 25 No. 2.
- Beijerse, R.P (1999). "Question in knowledge management: defining and conceptualizing a phenomenon". *Journal of knowledge Management*. Vol.3 No.2.
- Blau, P. M. (1964). *Exchange and power in social life*, New York: John Wiley.

- Bock, G.W and Zmud, R.W (2005). “Behavioral intention formation in knowledge sharing Examining the roles of extrinsic motivators, social-psychological forces and organizational climate”. *MIS Quarterly*.
- Cameron, K. S., and Quinn, R. E. (1999). “Diagnosing and changing organizational culture: Based on the competing values framework”. *Reading, Massachusetts: Addison-Wesley*
- Cheng, Z., and Li, C. (2011, August). “Research on relationship between knowledge sharing and team performance in RandD Team”. In *International Conference on Advances in Education and Management* (pp. 474-481). Springer, Berlin, Heidelberg.
- Chourides, P., Longbottom, D., and Murphy, W. (2003). “Excellence in knowledge management: an empirical study to identify critical factors and performance measures”. *Measuring business excellence*.
- Chow, W.S. and Chan, L.S. (2008). “Social network, social trust and shared goals in organizational knowledge sharing”. *Information and Management*.
- Chua, A. L., and Pan, S. L. (2008). “Knowledge transfer and organizational learning in IS offshore sourcing”. *Omega*, 36(2), 267-281.
- Connelly, C. E., and Kelloway, E. K. (2003). “Predictors of employees’ perceptions of knowledge sharing cultures”. *Leadership & Organization Development Journal*, 24(5), 294–301. <https://doi.org/10.1108/01437730310485815> [*Leadership and Organization Development Journal*]
- Davenport, T.H and Prusak, L. (1998). *Working knowledge: How organization manage what they know. Havard Business school Press*.
- Davenport, T.H. (1997). “Some principles of knowledge management”. *Unpublished Working Paper*.
- Ford, D.P. (2003). “Trust and knowledge management: The seeds of success”. *Heidelberg*.
- Fornell, C., and Larcker, D. F. (1981). “Structural equation models with unobservable variables and measurement error: Algebra and statistics”. *Journal of Marketing Research*. Vol. 18, No.3 (Aug., 1981)
- Freeman, L. L. (2019). *The influence of knowledge-sharing behaviors and moderating effect of organizational transactive memory systems on job satisfaction and organizational commitment*, Doctoral dissertation, Saint Leo University.
- Ganguly, A., Talukdar, A., and Chatterjee, D. (2019). “Evaluating the role of social capital, tacit knowledge sharing, knowledge quality and reciprocity in determining innovation capability of an organization”. *Journal of Knowledge management*. ISSN: 1367-3270
- Goh, S. C. (2002). “Managing effective knowledge transfer: an integrative framework and some practice implications”. *Journal of Knowledge management*. ISSN: 1367-3270
- Grandori, A., and Kogut, B. (2002). “Dialogue on organization and knowledge”. *Organization science*, 13(3), 224-231.
- Graves, L. M., Sarkis, J., and Zhu, Q. (2013). “How transformational leadership and employee motivation combine to predict employee pro-environmental behaviors in China”. *Journal of Environmental Psychology*, 35, 81-91.
- Gupta, A. K., and Govindarajan, V. (2000). Knowledge flows within multinational corporations. *Strategic management journal*, 21(4), 473-496.

- Hansen, S., and Avital, M. (2005). “Share and share alike: The social and technological influences on knowledge sharing behavior”. Case Western Reserve University, USA. *Sprouts: Working Papers on Information Systems*, 5(13) ISSN: 1535-6078.
- Hair, J. F., Jr., Black, W. C., Babin, B. J., and Anderson, R. E. (2009). *Multivariate data analysis (7th ed.)*. Upper Saddle River, NJ: Pearson Prentice Hall
- Hair, Joe F., Sarstedt, M., Ringle, C. M., and Mena, J. A. (2012). “An assessment of the use of partial least squares structural equation modeling in marketing research”. *Journal of the Academy of Marketing Science*, 40(3), 414–433.
- Hendriks, P. (1999). “Why share knowledge? The influence of ICT on the motivation for knowledge sharing”. *Knowledge and process management*, 6(2), 91-100.
- Hobfoll, S.E. (2001). “The influence of culture, community, and the nested-self in the stress process: advancing conservation of resource theory”, *Applied Psychology: An International Review*, Vol. 50 No. 3.
- Huysman, M and Wulf, V. (2006). “IT to Support Knowledge Sharing in Communities, Towards a Social Capital Analysis”. *Journal of Information Technology*.
- Jonassen, D., Davison, M., Collins, M., Campbell, J, and Bannan Haag, B, (1995). "Constructivism and computer mediated communication in distance education". *The American Journal of Distance Education*, 9(2), 7-26.
- Kim, S., and Lee, H. (2006). “The impact of organizational context and information technology on employee knowledge-sharing capabilities”. *Public administration review*, 66(3), 370-385.
- Kogut, B., and Zander, U. (1992). “Knowledge of the firm, combinative capabilities, and the replication of technology”. *Organization science*, 3(3), 383-397.
- Lee, C.K and Al-Hawamdeh, S. (2002). “Factors impacting knowledge sharing”. *Journal of Information and Knowledge management*. Vol. 01, No. 01. DOI: [10.1142/S0219649202000169](https://doi.org/10.1142/S0219649202000169)
- Liao, C., To, P. L., and Hsu, F. C. (2013). “Exploring knowledge sharing in virtual communities”. *Online Information Review*. DOI:10.1108/OIR-11-2012-0196
- Lu, L., Leung, K., and Koch, P. T. (2006). “Managerial knowledge sharing: The role of individual, interpersonal, and organizational factors”. *Management and Organization Review*, 2(1), 15-41.
- Mathieu, J. E., and Taylor, S. R. (2006). “Clarifying conditions and decision points for mediational type inferences in organizational behavior”. *Journal of Organizational Behavior*: <https://doi.org/10.1002/job.406>
- McDermott, R., and O'dell, C. (2001). “Overcoming cultural barriers to sharing knowledge”. *Journal of Knowledge management*. DOI:10.1108/13673270110384428
- Mullen, M. R. (1995). “Diagnosing measurement equivalence in cross-national research”. *Journal of International Business Studies*, 26(3), 573-596.
- Pooja, A.A., De Clercq, D., and Belausteguigoitia, I. (2016). “Job stressors and organizational citizenship behavior: The roles of organizational commitment and social interaction”. *Human Resource Development Quarterly*, 27, 373–405.
- Raykov, T. (1998). “Coefficient alpha and composite reliability with interrelated nonhomogeneous items”. *Applied psychological measurement*, 22(4), 375-385.

- Razmerita, L., Kirchner, K., and Nielsen, P. (2016). “What factors influence knowledge sharing in organizations? A social dilemma perspective of social media communication”. *Journal of Knowledge management*. DOI:10.1108/JKM-03-2016-0112
- Riege, A. (2005). “Three-dozen knowledge-sharing barriers managers must consider”. *Journal of Knowledge management*. Vol. 9, No. 3. DOI: <https://doi.org/10.1108/13673270510602746>
- Seba, I., Rowley, J., and Delbridge, R. (2012). “Knowledge sharing in the Dubai police force”. *Journal of Knowledge management*. DOI: <https://doi.org/10.1108/13673271211198972>
- Senge, P. (2006). “Systems citizenship: The leadership mandate for this millennium”. *Leader to Leader*, 2006(41), 21-26.
- Singh, J. B., Chandwani, R., and Kumar, M. (2018). “Factors affecting Web 2.0 adoption: exploring the knowledge sharing and knowledge seeking aspects in health care professionals”. *Journal of Knowledge Management*. Vol. 22, Issue 1
- Smith, H. A., and McKeen, J. D. (2003). “Instilling a knowledge-sharing culture”. *Queen’s Centre for Knowledge-Based Enterprises*, 20(1), 1-17.
- Stankosky, M., Calabrese, F. A., Dong, G., Liem, C. G., and Grossman, M. (2010). *Knowledge-sharing intention in Vietnamese organizations*. *Vine*.
- Storey, V. C., and Goldstein, R. C. (1993). “Knowledge-based approaches to database design”. *MIS Quarterly*, 25-46.
- Suppiah, V., and M. S. Sandhu. (2011). “Organizational Culture’s Influence on Tacit Knowledge-Sharing Behaviour.” *Journal of Knowledge Management*. DOI:10.1108/13673271111137439
- Tabachnick, B. G., and Fidell, L. S. (2001). “Using multivariate statistics”. *Allyn and Bacon. Needham Heights, MA*.

**Appendix**

**Appendix A: Survey questionnaires**

Please indicate your views on the following statements	1 Totally disagree	2 Disagree	3 Normal	4 Agree	5 Totally Agree
<b>Social trust</b>					
I know my colleagues will always try and help me out if I need a digital conversion reference.	1	2	3	4	5
The digital transformation knowledge shared by my colleagues has helped me to have a clearer direction in my work.	1	2	3	4	5
I feel comfortable talking about digital transformation issues with my colleagues.	1	2	3	4	5
<b>Information system</b>					
I see more and more technology solutions to support good work.	1	2	3	4	5

Please indicate your views on the following statements	1 Totally disagree	2 Disagree	3 Normal	4 Agree	5 Totally Agree
The organizations that provide technology solutions to facilitate the exchange of expertise.	1	2	3	4	5
The technology solutions that the organization is using effectively support the exchange of knowledge and expertise.	1	2	3	4	5
I feel comfortable using technology solutions in the exchange of information.	1	2	3	4	5
<b>Working time</b>					
I don't have time to exchange digital transformation knowledge with my colleagues.	1	2	3	4	5
The organization where I work does not arrange time for discussing digital transformation with colleagues.	1	2	3	4	5
I'm too busy to attend digital transformation seminars/trainings.	1	2	3	4	5
In many emergencies, the help of colleagues helped me find the right solution.	1	2	3	4	5
<b>Confidence in personal knowledge</b>					
Sharing my knowledge will help answer my colleagues' questions.	1	2	3	4	5
Sharing my knowledge will contribute to the spread of digital transformation knowledge.	1	2	3	4	5
Sharing my knowledge will contribute to improving the efficiency of the country's digital transformation.	1	2	3	4	5
<b>Expected associations of relationship</b>					
Sharing digital transformation knowledge helps me strengthen good relationships.	1	2	3	4	5
Sharing digital transformation knowledge helps me get acquainted with new colleagues	1	2	3	4	5
Sharing digital transformation knowledge helps me facilitate cooperation with colleagues.	1	2	3	4	5
Sharing digital transformation knowledge helps me expand the scope of communication.	1	2	3	4	5

Please indicate your views on the following statements	1 Totally disagree	2 Disagree	3 Normal	4 Agree	5 Totally Agree
Sharing digital transformation knowledge helps me create good relationships with people with the same expertise.	1	2	3	4	5
<b>Leader</b>					
My leader has always been a shining example in sharing his digital transformation knowledge with others.	1	2	3	4	5
My leaders support me to share digital transformation knowledge with colleagues in other departments.	1	2	3	4	5
My leadership allows me to share digital transformation knowledge with colleagues even though it may affect my current workflow.	1	2	3	4	5
My leadership guides us on how to share personal knowledge about digital transformation.	1	2	3	4	5
My leadership is interested in my digital transformation knowledge and encourages me to share my digital transformation knowledge with other colleagues.	1	2	3	4	5
<b>Knowledge sharing</b>					
The unclear and complicated transactions should be discussed before drawing conclusions.	1	2	3	4	5
In the process of working, colleagues often exchange their digital transformation knowledge and experiences.	1	2	3	4	5
In my work, I am willing to share my knowledge and experience on digital transformation with my colleagues.	1	2	3	4	5
I don't hesitate to share my digital transformation feelings and perceptions with my colleagues.	1	2	3	4	5

**Appendix B: Checking the reliability of Cronbach’s alpha scale**

**Social trust (ST)**

**Reliability Statistics**

Cronbach's Alpha	N of Items
.669	3

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ST1	7.03	2.603	.403	.668
ST2	7.36	1.905	.567	.450
ST3	7.17	1.954	.488	.567

**Information systems (IS)**

**Reliability Statistics**

Cronbach's Alpha	N of Items
.690	4

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
IS1	10.17	5.778	.503	.608
IS2	10.31	6.951	.458	.637
IS3	10.20	6.487	.492	.614
IS4	9.81	6.539	.450	.640

**Working time (WT)**

**Reliability Statistics**

Cronbach's Alpha	N of Items
.814	4

**Item-Total Statistics**

	<b>Scale Mean if Item Deleted</b>	<b>Scale Variance if Item Deleted</b>	<b>Corrected Item-Total Correlation</b>	<b>Cronbach's Alpha if Item Deleted</b>
WT1	11.80	4.456	.621	.771
WT2	11.92	4.263	.669	.749
WT3	11.97	4.198	.615	.776
WT4	11.79	4.425	.628	.768

**Confidence in personal knowledge (CP)****Reliability Statistics**

<b>Cronbach's Alpha</b>	<b>N of Items</b>
.755	3

**Item-Total Statistics**

	<b>Scale Mean if Item Deleted</b>	<b>Scale Variance if Item Deleted</b>	<b>Corrected Item-Total Correlation</b>	<b>Cronbach's Alpha if Item Deleted</b>
CP1	7.99	1.856	.572	.689
CP2	8.11	1.728	.531	.736
CP3	8.07	1.577	.657	.585

**Expected associations (EA)****Reliability Statistics**

<b>Cronbach's Alpha</b>	<b>N of Items</b>
.642	5

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
EA1	15.03	5.208	.374	.606
EA2	15.21	5.459	.473	.552
EA3	15.14	5.955	.331	.618
EA4	14.98	6.198	.355	.608
EA5	14.74	5.417	.459	.557

**Leadership (LD)**

**Reliability Statistics**

Cronbach's Alpha	N of Items
.639	5

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
LD1	15.03	4.020	.409	.578
LD2	15.20	4.647	.363	.601
LD3	15.08	4.372	.371	.596
LD4	15.04	3.929	.432	.566
LD5	14.86	4.203	.391	.587

**Knowledge Sharing (KS)**

**Reliability Statistics**

Cronbach's Alpha	N of Items
.645	4

## Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
KS1	11.45	2.498	.396	.596
KS2	11.55	2.457	.414	.584
KS3	11.41	2.527	.444	.566
KS4	11.16	2.250	.449	.560

Appendix C: Exploratory Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.773
Bartlett's Test of Sphericity	Approx. Chi-Square	1733.504
	df	276
	Sig.	.000

Rotated Component Matrix<sup>a</sup>

	Component						
	1	2	3	4	5	6	
WT2	.806						<i>Extraction Method:</i> Principal Component Analysis.  <i>Rotation Method:</i> Varimax with Kaiser Normalization.  a. Rotation converged in 6 iterations.
WT4	.791						
WT3	.687						
WT1	.670						
EA2		.638					
EA4		.635					
EA5		.619					
EA1		.586					
EA3		.563					
LD2		.432		.383			
IS3			.741				
IS1			.739				
IS4			.693				
IS2			.675				
LD3				.699			
LD5				.644			
LD4				.631			
LD1				.591			
ST2					.825		
ST3					.712		
ST1					.629		
CP3						.792	
CP1						.715	
CP2	.418					.689	

## Second Time

## KMO and Bartlett's Test

<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</b>		.767
<b>Bartlett's Test of Sphericity</b>	Approx. Chi-Square	1641.102
	df	253
	Sig.	.000

Rotated Component Matrix<sup>a</sup>

	Component					
	1	2	3	4	5	6
WT2	.829					
WT4	.802					
WT3	.692					
WT1	.657					
EX5		.649				
EX2		.644				
EX4		.637				
EX1		.592				
EX3		.547				
IS3			.743			
IS1			.738			
IS4			.697			
IS2			.673			
ST2				.827		
ST3				.727		
ST1				.628		
CP3					.784	
CP1					.722	
CP2	.414				.693	
LD3						.726
LD5						.648
LD4						.624
LD1						.581

*Extraction Method:* Principal Component Analysis.

*Rotation Method:* Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

## Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.415	19.197	19.197	4.415	19.197	19.197	2.598	11.295	11.295
2	2.559	11.126	30.322	2.559	11.126	30.322	2.175	9.456	20.751
3	1.968	8.554	38.877	1.968	8.554	38.877	2.156	9.373	30.123
4	1.579	6.867	45.744	1.579	6.867	45.744	2.021	8.787	38.910
5	1.182	5.139	50.883	1.182	5.139	50.883	1.989	8.648	47.558
6	1.154	5.016	55.899	1.154	5.016	55.899	1.918	8.341	55.899
7	.932	4.052	59.951						
8	.917	3.985	63.936						
9	.856	3.722	67.658						
10	.836	3.637	71.295						
11	.753	3.272	74.567						
12	.691	3.006	77.573						
13	.662	2.877	80.450						
14	.629	2.736	83.185						
15	.551	2.394	85.579						
16	.515	2.238	87.817						
17	.498	2.164	89.981						
18	.476	2.070	92.051						
19	.438	1.906	93.957						
20	.401	1.742	95.700						
21	.390	1.694	97.394						
22	.333	1.447	98.840						
23	.267	1.160	100.000						

*Extraction Method:* Principal Component Analysis.

**Independent**

**Component Matrix<sup>a</sup>**

	Component
	1
KS4	.720
KS3	.715
KS2	.688
KS1	.664

**Appendix D: Linear regression analysis**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.501 <sup>a</sup>	.251	.235	.42959	.251	15.680	6	280	.000

a. Predictors: (Constant), LD, ST, IS, CP, EA, WT

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.362	6	2.894	15.680	.000 <sup>b</sup>
	Residual	51.674	280	.185		
	Total	69.036	286			

a. Dependent Variable: KS

b. Predictors: (Constant), LD, ST, IS, CP, EA, WT

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.734	.266		6.519	.000		
ST	.088	.040	.122	2.180	.030	.850	1.177
WT	-.102	.047	-.139	-2.160	.032	.645	1.551
IS	.075	.032	.123	2.325	.021	.961	1.041
CP	.029	.049	.038	.597	.551	.661	1.513
EA	.245	.051	.285	4.841	.000	.772	1.296
LD	.226	.052	.248	4.316	.000	.810	1.235

a. Dependent Variable: KS

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