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Increasing Innovative Working Behaviour of Information Technology Employees in Vietnam by Knowledge Management Approach

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Abstract: Today, Knowledge Management (KM) is becoming a popular approach for improving organizational innovation, but whether encouraging knowledge sharing will lead to a better innovative working behaviour of employees is still a question. This study aims to identify the factors of KM affecting the innovative working behaviour of Information Technology (IT) employees in Vietnam. The research model involves three elements: attitude, subjective norm and perceived behavioural control affecting knowledge sharing, and then, on innovative working behaviour. The research method is the quantitative method. The survey was conducted with 202 samples via the five-scale questionnaire. The analysis results show that knowledge sharing has a positive impact on the innovative working behaviour of IT employees in Vietnam. Besides, attitude and perceived behavioural control are confirmed to have a strong positive effect on knowledge sharing, but the subjective norm has no significant impact on knowledge sharing. Based on this result, recommendations to promote knowledge sharing and the innovative work behaviour of IT employees in Vietnam are made.

Keywords: knowledge management; knowledge sharing; innovation; information technologies; Vietnam

1. Introduction

Today, knowledge has become an essential resource for ensuring the competitive advantage of any enterprise [1,2]. Moreover, knowledge is an important input for research and development as well as the innovation activities of all industries and ensuring the sustainability of organizations [3,4]. Especially for the Information Technology (IT) industry, the fast development of technology requires IT employees to learn more quickly, to share knowledge mutually, increase awareness and to reuse knowledge properly for a more innovative working environment [5]. Innovation is the goal for the success and sustainable development of any enterprise in the knowledge economy [6]. Therefore, many IT enterprises applied a Knowledge Management (KM) approach [7] for managing their knowledge resources and facilitating the knowledge flow to support an innovation strategy. Knowledge sharing between IT employees may lead to creative and innovative behaviour, which is very helpful in developing new ideas and new products [8]. However, the real impact of the knowledge management

approach on the innovative working behaviour of employees is not known precisely in the context of the IT industry in Vietnam.

The IT industry in Vietnam is developing very quickly, and the demand for IT resource has increased in recent years. According to the Vietnam Software and IT Services Association (VINASA), the growth rate of Vietnamese IT industry is about 30% per year [9]. The industry reached revenues of more than USD 119 billion in 2019, creating over 1 million jobs and contributing over 14% to the national GDP. Vietnam is rapidly developing a labour force to meet the requirements of IT development. With more than 290 universities offering IT studies and 55,000 students enrolled each year, Vietnam is becoming a leading IT service destination in Asia. However, the IT sector employees in Vietnam lack creativity, and the innovation capability of Vietnamese IT companies is relatively low [10,11] in comparison with other countries in the South East Asia region, such as China, India, Korea, and Malaysia. So, some IT companies in Vietnam began to apply Knowledge Management (KM) tools and approaches for managing their knowledge resources better, with the long-term goal to boost the innovative working behaviour of their employees [11]. However, the relationship between KM approach and innovation capability is not examined thoroughly, especially in the context of the IT industry in Vietnam. Therefore, exploring the factors affecting knowledge sharing behaviour and on the innovative working behaviour of IT employees is necessary.

Currently, some studies are focusing on knowledge sharing behaviour. Still, there is a lack of research about innovative working behaviour in the context of the IT industry in a developing country such as Vietnam. To improve the innovation capability, first, the knowledge from IT companies must be acquired and elicited [12,13], then it must be shared and reused among IT employees. Understanding the impact of knowledge sharing on innovative working behaviour will encourage IT companies to invest more on the KM approach for supporting their innovation projects.

This paper aims (1) to explore the factors impacting innovative working behaviour through the knowledge sharing of IT employees in Vietnam and (2) to suggest the solutions for increasing the innovative working behaviour of IT employees in Vietnam by the KM approach. The meaning of this research is to help the Vietnamese IT industry to develop sustainably in knowledge society based on their innovative capability and to support the strategy of the Vietnamese Government toward an industrial revolution 4.0.

The structure of this paper is as follows: Section 2 presents some definitions and related works; Section 3 provides the research design; Section 4.1 summarizes data collection and sample description; Sections 4.2–4.6 presents main data analysis results; Sections 5.1 and 5.2 mentions some discussions and managerial implications; finally, Section 5.3 summarizes the main conclusions and future research directions.

2. Definitions and Related Works

2.1. Main Concepts

According to Nonaka and Takeuchi [14], knowledge is a "justified belief". Knowledge is extracted from data or information to actively support working performance, solving problems, making decisions, learning and teaching [15]. Polanyi [16] clarified two main kinds of knowledge, including tacit and explicit knowledge. Both types of knowledge are important and must be managed to bring values to business.

Knowledge management is the process of creating, using, sharing, and practicing knowledge in an organization [17,18]. To manage knowledge successfully, there is a need for a process of enhancing capabilities, motivations and opportunities for individuals and groups in learning, accumulating and applying knowledge to create positive business performance [19]. Dalkir [20] suggested that an integrated KM cycle must cover three main activities, including knowledge capturing and creating, knowledge sharing and transferring, and knowledge acquiring and applying.

Knowledge sharing is a critical part of the KM process, which focuses on encouraging individuals to send and receive their knowledge, especially tacit knowledge, for creating a collective understanding and a more significant power [21]. Holub [22] emphasized that knowledge sharing supports the transferring of knowledge and facilitating a better innovative capability. Mom et al. [23] showed that the flow of knowledge from both a horizontal and vertical direction has an impact on the innovative behaviour of mid-level managers. Therefore, knowledge sharing has a significant effect on individual innovative working behaviour.

Innovative working behaviour is an individual innovation activity, which tries to introduce and apply some new ideas in doing a job that can help to increase the working performance of an individual, a group or an organization [24,25]. Innovative working behaviour includes three separated tasks: generating ideas or developing new solutions; advertising ideas or getting outside support; applying concepts or creating prototyping for the new solution. The scope of this behaviour includes a significant change or a small improvement in product, service and/or business process [26].

2.2. Foundation Theories and Related Research

The theory of planned behaviour (TPB), proposed by Ajzen [27], is based on the theory of rationed action (TRA). In the TPB model, three main factors are impacting on the intention and behaviour of a person, including attitude, subjective norm, and perceived behavioural control (newly added by TPB). The TPB model is very popular and used mostly in predicting people's intention and behaviour, especially knowledge sharing behaviour. Therefore, in this research, TPB is used as a base for developing the research model. Some related studies are summarized in Table 1.

Table 1. Summary of related researches.

Author	Methods	Main Results
Yu et al. [28]	A survey in Taiwan for evaluating the relationship of knowledge sharing, innovative behaviour and organizational climate at both individual and organizational levels.	The results showed that knowledge sharing and communicating have a positive impact on personal creativity behaviour and organizational innovation capability. This result encourages other companies to apply a KM approach for increasing employees' creativity behaviour.
Alhalhouli et al. [29]	Structural exploratory and quantitative methods were used for evaluating factors influencing knowledge sharing in Jordanian hospitals.	Nine factors were identified to have impacts on knowledge sharing behaviour, including educational level, mutual benefits, cognition of power, fame, ease of use, leadership, organizational culture, service and perception.
Akhavan et al. [30]	A quantitative method was applied for collecting data from R&D departments of 22 high-tech companies in Iran.	The results identified the impact of three motivational factors (knowledge loss, fame, reciprocal), and two social capital factors (social interaction, trust). This research also showed that knowledge sharing behaviour helped to increase their innovative working behaviour.
Afsar et al. [31]	A survey and quantitative method were used. Data include 530 flight attendants recruited by eight Thailand airline companies.	The results confirmed that flight attendants in Thailand tend to have a positive attitude toward knowledge sharing and innovative behaviour, such as: willing to share knowledge and to learn. They can also make continuous improvements and collaborate with others in finding a solution or developing a new service.
Long et al. [32]	The online survey method was applied to collect data from 182 automobile supplier companies in China.	The results showed that the attitude, subjective norm, and perceived behavioural controls have positive impacts on the innovation behaviours of employees in the automobile industry in China toward economic and environmental performance.
Jokanović et al. [33]	Two standardized questionnaires were employed to collect data from 190 participants in Serbia.	The results confirmed that organizational business culture supports the explanation of KM activities, especially knowledge sharing behaviour between employees.

In general, the above research confirmed the positive impact of personal psychological factors (attitude, subjective norm, perceived behavioural control) on knowledge sharing and the innovative working behaviour of employees from various industries. However, according to the KM approach, the psychological and cultural factors are realized to have more of an influence on knowledge sharing than innovative working behaviour. Yu et al. [28] explored the impact of the KM approach on organizational innovation capability, but other researchers focused on innovative personal behaviour. This research will focus on individual innovative working behaviour and explore the relationship between knowledge sharing and the innovative working behaviour of IT employees, which is also confirmed in previous studies from other industries, such as the automobile, healthcare, airline, hospital, and R&D industries [34,35].

3. Research Model and Research Design

3.1. Proposed Research Model

Based on the TPB model [27], three main factors impacting knowledge sharing are identified, including attitude, subjective norm, and perceived behavioural control, in which attitude is a personal judgment about the level of benefit of behaviour; the subjective norm is a personal perception about whether other people agree with that action or not; perceived behavioural control is the level of easiness of action depending on one's capability or technology.

Because knowledge sharing intention can turn into behaviour easily with the support of many communication and collaboration technologies in IT companies, in the research context, a combination of knowledge sharing intention and knowledge sharing behaviour is suggested and referred to as "knowledge sharing". From previous research [28,30], the influence of knowledge sharing on innovative working behaviour was realized, especially in high-tech industries. Therefore, in the proposed research model, knowledge sharing could have a positive impact on innovative working behaviour. In summary, the proposed research model could be illustrated in Figure 1.

Based on the above model, the following research hypotheses are formulated:

H1: Attitude toward knowledge sharing has a positive impact on knowledge sharing of IT employees.

H2: Subjective norm toward knowledge sharing has a positive impact on knowledge sharing of IT employees.

H3: Perceived behavioural control has a positive impact on knowledge sharing of IT employees.

H4: Knowledge sharing of IT employees has a positive impact on their innovative working behaviour.

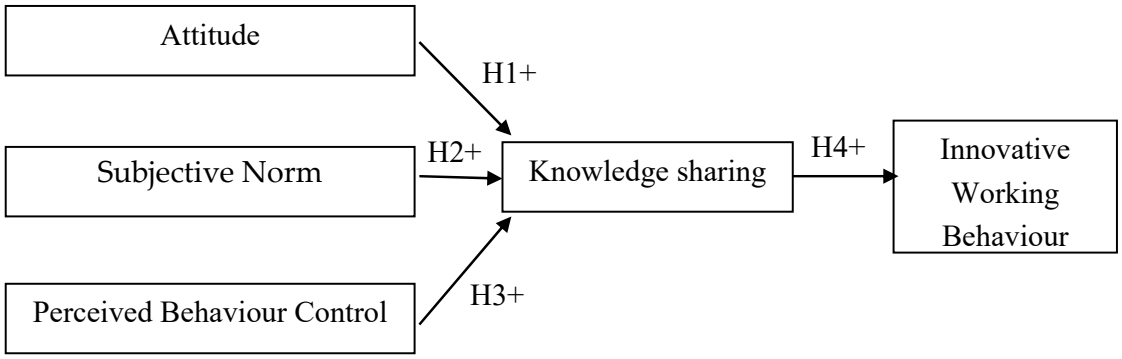

Figure 1. The proposed research model.

3.2. Research Design

The measurement scales for data collection are based on the above model using 5-point Likert scales. Those factors include Attitude (ATT), Subjective Norm (SUB), Perceived Behavioural Control

(PBC), Knowledge Sharing (KS) and Innovative Working Behaviour (IWB). The original scales are from [25,30,31,36,37].

Based on in-depth interviews with 25 IT experts, managers, and employees in Ho Chi Minh City (HCMC), which is considered the most dynamic software production centre in Vietnam [11], some scales were modified, and the final questionnaire was made (see Appendix A). Data were collected in HCMC from February 2019 to April 2019, including by both online and offline methods. The convenience sampling method was used for collecting the data. The collected data will be used for testing the research model and with the support of SPSS software.

The analysis methods include Cronbach alpha analysis, exploratory factor analysis (EFA), correlation and regression analysis. Those tests are to test the reliability of measurement scales and to test the research hypothesis. Considering the data analysis results and interviews, we recommend increasing the innovative working behaviour of IT employees in Vietnam based on the KM approach.

4. Data Collection, Analysis and Results

4.1. Data Collection

There were 261/270 responded questionnaires, in which 202 samples were valid for data analysis (77.4%). Table 2 summarizes the main characteristics of the samples by some demographic factors, such as gender, age, position, years of experience and size of the company.

Table 2. Descriptive statistics of samples.

Category	Freq.	%	Category	Freq.	%
Gender			Position		
Male	141	69.8	Hardware engineer	23	11.4
Female	61	30.2	Software engineer	131	64.9
Age			Team leader	42	20.8
22–40	188	93.1	Department head	6	3
>40	14	6.9	Years of experience		
Company size			<1 year	21	10.4
<50	29	14.4	1–5 years	85	42.1
50–100	15	7.4	5–10 years	72	35.6
100–300	124	61.4	10–20 years	23	11.4
>300	34	16.8	>20 years	1	0.5

According to the above table, the samples are suitable for the whole population of the IT industry in Vietnam, in which most IT employees are male (69.8%), the majority age group is 22–40 (93%), most IT companies are small and medium-sized (83.2%) and belong to software sector (85.7%).

4.2. Cronbach's Alpha Analysis

The Cronbach's alpha coefficients are used to remove unsuitable variables. According to Hair et al. [38], the factors are reliable if Cronbach alpha ≥0.6. Besides, item-total correlation of each variable must be >0.3. Table 3 summarizes the final Cronbach alpha results for all factors (after removing the variables SUB3, KS6).

Table 3. Cronbach's Alpha analysis results.

Code	Mean if Item Deleted	Variance if Item Deleted	Item–Total Correlation	Alpha if Item Deleted
	Attitude		Alpha = 0.872	
ATT1	8.35	2.179	0.749	0.826
ATT2	8.32	2.277	0.762	0.815
ATT3	8.43	2.177	0.755	0.820
	Subjective norm		Alpha = 0.735	
SUB1	7.03	2.168	0.628	0.563
SUB2	7.22	2.197	0.663	0.519
SUB4	7.36	2.977	0.407	0.809
	Perceived behavioural control		Alpha = 0.768	
PBC1	7.45	2.597	0.580	0.711
PBC2	7.18	2.369	0.666	0.615
PBC3	7.10	2.492	0.561	0.734
	Knowledge sharing		Alpha = 0.825	
KS1	7.97	1.874	0.656	0.785
KS2	7.87	1.848	0.731	0.709
KS3	7.84	1.945	0.660	0.780
KS4	7.43	2.733	0.577	0.814
KS5	7.73	1.980	0.713	0.696
	Innovative working behaviour		Alpha = 0.748	
IWB1	10.45	4.189	0.504	0.711
IWB2	10.46	3.881	0.593	0.660
IWB3	10.51	4.132	0.525	0.699
IWB4	10.27	4.289	0.550	0.687

4.3. Exploratory Factor Analysis (EFA)

According to Hair et al. [38], there are three tests in EFA to be checked, which includes fitness test through KMO coefficient (KMO must be between 0.5 and 1), correlations between variables through the Bartlett test (sig. must be less than 0.05), and the discrimination value through Principal extraction and the Varimax rotation method (factor loadings must be higher than 0.5, and no variable loads on more than two factors).

For a group of independent variables (attitude, subjective norm, perceived behavioural control), KMO = 0.755, which satisfies the criteria of 0.5 < KMO < 1, so EFA is suitable for data samples. Bartlett's test with Sig. = 0 < 0.05 means that variables have relations with the representative factor. Extracted variance is 72.58%, which shows that the variables could explain the 72.58% change in the representative factor. After running the EFA test, the results show that all variables satisfied the criteria and could be loaded into three factors, including attitude (att1, att2, att3), subjective norm (sub1, sub2, sub4), and perceived behavioural control (pbc1, pbc2, pbc3).

For a group of dependent variables (knowledge sharing, innovative working behaviour), KMO = 0.824, which satisfies the criteria of 0.5 < KMO < 1, so EFA is suitable for data samples. Bartlett's test with Sig. = 0 < 0.05 means that variables have relations with the representative factor. Extracted variance is 63.01%, which shows that variables could explain the 63% change in the representative factor. After running the EFA test, the results show that all variables satisfied the

criteria and could be loaded into two elements, including knowledge sharing (ks1, ks2, ks3, ks4, ks5), and innovative working behaviour (iwb1, iwb2, iwb3, iwb4).

4.4. Correlation Analysis

The Pearson correlation test shows that there are significant relationships between three independent factors (attitude, subjective norm, and perceived behavioural control) and the dependent factor (knowledge sharing). The results show that all correlation coefficients were greater than 0.3 at a 99% confidence level.

Similarly, the Pearson test between knowledge sharing and innovative working behaviour shows that they are strongly correlated with a correlation coefficient greater than 0.5 at a 99% confidence level.

4.5. Regression Analysis

Regression analysis is employed to test the causal relationship between independent factors and the dependent factor. There are two models to be tested, including (1) between attitude, subjective norm, perceived behavioural control and knowledge sharing, and (2) between knowledge sharing and innovative working behaviour.

The analysis results of model 1 (between three independent factors and knowledge sharing) are summarized in Table 4.

Table 4. Regression analysis results (model 1).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.994	0.220		4.515	0.000		
	Subjective norm	0.052	0.047	0.061	1.109	0.269	0.834	1.199
	Attitude	0.303	0.050	0.347	6.114	0.000	0.772	1.296
	Perceived behavioural control	0.401	0.046	0.477	8.783	0.000	0.844	1.184
Dependent variable: Knowledge sharing								

The F test in the ANOVA analysis shows that sig. = 0 < 0.05, which means that the model is suitable and could be used for regression analysis. Regression results show that Adjusted R2 = 0.499. So, the independent variables could explain nearly 50% of the change in the dependent variable. From the above table, the sig. values of Attitude and Perceived behavioural control < 0.05, which means that these two factors have a significant impact on knowledge sharing, while the sig. value of Subjective norm = 0.269 > 0.05, which means an insignificant impact (at 95% confidence level).

The results for model 2 (between knowledge sharing and innovative working behaviour) are summarized in Table 5.

Table 5. Regression analysis results (model 2).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.256	0.242		5.200	0.000		
	Knowledge sharing	0.568	0.061	0.549	9.297	0.000	1.000	1.000
Dependent variable: Innovative working behaviour								

The F-test in the ANOVA analysis shows that sig. = 0 < 0.05, which means that the model is suitable and could be used for regression analysis. Regression results show that Adjusted R2 = 0.298. So, the independent variables could explain nearly 30% of the change in the dependent variable. From Table 5, the significant value = 0 < 0.05, which means that knowledge sharing has a significant impact on innovative working behaviour (at 95% confidence level).

4.6. Hypothesis Test

Based on the above regression results, conclusions of hypothesis test could be summarized as follows:

Accepted hypotheses:

H1 (+): Attitude toward knowledge sharing has a positive impact on knowledge sharing of IT employees (beta = 0.347, sig. = 0.0).

H3 (+): Perceived behavioural control has a positive impact on knowledge sharing of IT employees (beta = 0.477, sig. = 0.0).

H4 (+): Knowledge sharing of IT employees has a positive impact on their innovative working behaviour (beta = 0.549, sig. = 0.0).

Not accepted hypothesis:

H2 (+): Subjective norm toward knowledge sharing has a positive impact on knowledge sharing of IT employees (beta = 0.061, sig. = 0.269).

Regarding the rejection of H2, the reason could be due to the nature of the IT industry. In this industry, knowledge could only be shared in a small group of people with the same interests or using the same tools or techniques, so that knowledge sharing mostly comes from the personal intention of the knowledge giver, rather than from the external persuasion of nearby people.

5. Discussion and Implications

5.1. Discussion

Based on this result, perceived behavioural control has a strong positive impact on the knowledge sharing of IT employees in Vietnam. This is similar to the previous results of Afsar et al. [31], Akhavan et al. [30], and Long et al. [32]. However, in previous research, the impact of perceived behavioural control was lower than of attitude. This shows that in the Vietnam context, the means for knowledge sharing are more important than the attitude because most of IT employees in Vietnam have a good attitude toward sharing their knowledge with colleagues (which stems from Vietnamese culture).

Besides, in IT companies, employees are working in groups or projects, which are separated from each other. Moreover, the high workload of the IT employees also prevents them from sharing knowledge, even though they want to share. According to our survey, most problems for the knowledge sharing of the IT employees in Vietnam include lack of time, lack of suitable tools or environments for sharing knowledge (such as forum, video conferences, internal communication tools), and lack of language/communication capability. So, the IT companies in Vietnam should focus on improving the

perceived behavioural control of their employees by providing suitable tools, redesigning the working environment, reducing their workload, and training their communication skills.

The next decisive impact factor on knowledge sharing is attitude. This result is similar to the previous results of Akhavan et al. [30], and Long et al. [32]. Indeed, personal attitude will determine their intentions and behaviour. In the IT industry, individual attitude is more important in predicting knowledge sharing behaviour. To change employee attitudes toward knowledge sharing, a collaborative and knowledge sharing culture should be developed. Knowledge sharing culture is essential for IT employees to overcome their worry of losing power in sharing knowledge.

This research confirmed the positive impact of knowledge sharing on the innovative working behaviour of IT employees in Vietnam. Based on this, IT companies should invest more in the KM approach to promote both knowledge sharing and the innovative working behaviour of their employees, as suggested by Pham [11]. This result is similar to previous findings of Afsar et al. [31], Akhavan et al. [30], and Yu et al. [28].

5.2. Managerial Implications

Based on the above results, some suggestions and solutions could be made to help IT companies in Vietnam to promote both knowledge sharing and innovative working behaviour as follows:

- Raising perceived behavioural control of IT employees through several activities, such as training soft-skills for employees (focus on communication, and presentation skills), providing suitable tools (wiki, internal social network, etc.) for collaboration and sharing knowledge, creating a knowledge portal for keeping and sharing lessons learnt from all project members. Besides, managers should find some innovative solutions for reducing the workload for their employees, so that they have more time for innovating, learning, and sharing knowledge.
- Encouraging a positive attitude of the knowledge sharing of employees by organizing some competitions between groups with awards for knowledge sharing and collaborating between members. Besides, redesigning the key performance indicator (KPI) structure to add some measures relating to knowledge sharing and innovating to encourage these behaviours in the company.

Developing a knowledge sharing culture is also helpful in promoting knowledge sharing and the innovative working behaviour of IT employees. To do this, IT companies should organize frequent meetings, seminars, workshops for encouraging the sharing of experiences and new ideas between employees. The long-term goal is to redesign business processes, organizational structure, and working environments to support knowledge searching, learning, sharing and creating. Managers should play a model role in knowledge sharing for other employees to learn and to follow.

5.3. Final Remarks

In summary, this research explored the factors impacting on knowledge sharing and innovative working behaviour of IT employees in Vietnam. The analysis of the data, collected from 202 valid samples in Ho Chi Minh City, shows that two main factors influence knowledge sharing. The first is perceived behavioural control (beta = 0.477), and attitude (beta = 0.347), and the second is innovative working behaviour, which is influenced by knowledge sharing (beta = 0.549). However, according to this result, the subjective norm has no significant impact on knowledge sharing. The above results could be used as a reference for managers of IT companies in Vietnam in promoting knowledge sharing and the innovative working behaviour of their employees.

The recommendations include: make it easy and convenient for employees to share knowledge; apply suitable KPIs for encouraging knowledge sharing and innovating; develop a knowledge sharing culture in their organization.

The limitations of this research are: (1) a small sample size with convenient sampling method and respondents located in HCMC (Vietnam) only; (2) this research focused on knowledge management

approaches for encouraging innovative working behaviour, so there is a lack of some other factors affecting on innovative working behaviours in the proposed research model.

Our further research directions are to extend the data samples to various regions and to evaluate the impact of some other factors on the innovative working behaviour of IT employees, such as organizational culture, human resource management practices and technology support.

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Appendix A

Factor	Code	Question
Attitude	*ATT1*	Sharing knowledge with colleagues is smart
	ATT2	Sharing knowledge in general is good
	ATT3	Sharing knowledge with colleagues is valuable.
Subjective norm	*SUB1*	My boss think that I should share my knowledge with colleagues
	SUB2	My peers think that I should share my knowledge with colleagues
	SUB3	I accept my boss' direction although I am not agree with
	SUB4	I appreciate and follow my colleagues' suggestions.
Perceived behavioural control	PBC1	I have enough time to sharing my knowledge with colleagues
	PBC2	I have suitable tools for sharing my knowledge with colleagues
	PBC3	I am able to share my knowledge with colleagues
Knowledge sharing	KS1	I will share my knowledge with my colleagues more frequent
	KS2	I will share my experience to my colleagues in the future
	KS3	I will help to train my colleagues if necessary
	KS4	I am sharing my knowledge with my colleagues
	KS5	I am sharing my information/reports with my colleagues
	KS6	I am sharing new ideas/solutions with my colleagues
Innovative working behaviour	IWB1	I often introduce some small innovations in my practices.
	IWB2	I often develop new processes for improving my daily tasks.
	IWB3	I often success in turning new ideas into practical solutions.
	IWB4	I often develop new solutions for solving problems.

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