



# The determinants of knowledge sharing in Moroccan public and semi-public institutions

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**Abstract :** Morocco has recently embarked on a process of public and semi-public sector reform to strengthen its contribution to economic development. These changes prioritise digital transformation, information system development and human capital development. The reforms could have a negative effect on the resilience of the knowledge patrimony, especially in light of mass retirements and work practices modified by digital migration. In this context, the creation of a reliable knowledge patrimony depends on effective knowledge sharing.

This research attempts to identify the factors that influence the performance of the sharing process. Thus, the impact of several factors, including the management processes implemented by the management, information systems, digitalisation and motivational measures, was studied.

Using the information collected from 96 people working in the sector, the correlations between the above variables were tested empirically. Using structural equation-PLS models are used to model these causal links. They deal with the direct impact on knowledge sharing as well as the mediating and moderating effects on the link between management procedures and knowledge sharing.

The results showed that, the management process developed by the management, the information system and the motivation favourably influence the knowledge sharing process while the impact of digitalisation was not approved. The information system, digitalisation and motivation justified mediation while only the information system justified the role of moderator. The study concludes that the performance of sharing is dependent on several factors which are the socialisation of knowledge, internal communication, internal training, culture and leadership of knowledge, documentation, information systems and motivation.

**Keywords :** Information system, digitalization, Motivation, SEM-PLS, internal communication, culture of knowledge, internal training, leadership.

## 1. Introduction

The developments and changes that Morocco has lived through in recent years are due to the requirements of the national and international environment and are the result of its political, economic and social ambitions as well as its positioning on the world stage.

These ambitions have been defined by the new development model in the form of strategies and policies for the different areas of competitiveness. Within this framework, the public and semi-public sector has been identified as a lever for development and a driving force for the future strategic vision and success of the new model's orientations.

The role assigned to the sector of this model depends on its capacity to assume its responsibilities in terms of quality of public service and to generate value. Indeed, the latest diagnoses have shown that the sector suffers from several shortcomings that concern governance, information system, human resource adequacy and digital transformation. These areas are the major axes of the sector's reform.

The aim of the reform is to improve the performance of the sector by redesigning the way things are done, renewing knowledge, developing the information system, developing human capital and migrating processes to digital technology.

In this context, knowledge as an intangible resource (intellectual capital) that contributes to value creation, are likely to undergo great change as a result of digital transformation and exposed to the risk of loss due to mass retirement (loss of knowledge sources). Sharing knowledge can ensure the reliability and relevance of intellectual capital, as the exchange allows for necessary corrections to be made, existing knowledge to be developed and the knowledge and information assets to be made reliable. It guarantees the continuity of the activity against the risk of loss of knowledge in case of loss of their sources (departure, dismissal or resignation). Technological evolution and innovation have been accentuated in recent years in all domains, resulting in the emergence and adoption of new strategic orientations such as the implementation of information systems, digitalisation of processes, knowledge management, business intelligence, etc. These changes aim to institute new ways of doing things, new knowledge, and to facilitate the creation, sharing, transfer, storage and management of knowledge.

Knowledge sharing defined by Yoo et al. (2007) as the process of creating a mutual stock of knowledge among individuals or groups through direct or indirect interaction is a key indicator of the quality of teamwork and the presence of a healthy climate based on trust.

The objective of this study is to identify the determinants of a successful knowledge sharing process in Moroccan public and semi-public organisations. Therefore, it will explore the relationship between the efforts of the management body to promote knowledge sharing, the information system, digitalisation, motivation and the performance of the knowledge sharing process.

Based on a survey of people operating in the public and semi-public sector, the study defined five variables which are:

- Management efforts defined by six processes (socialisation, internal communication, internal training, culture of knowledge, leadership and documentation), Information systems.
- Digitalisation.
- Motivation.
- Knowledge sharing.

The research uses structural equation models and estimates the parameters of the models using the partial least square (PLS) approach.

The following sections include the literature review, methodology, results, discussion and conclusion.

## 2. Literature review :

Knowledge is an organisation's intangible asset that includes expertness, management style, and culture. Many studies have examined the relationship between data, information, and knowledge such as Ermine et al. (2012) who consider that data processing creates information, information processing and use creates knowledge and knowledge processing generates wisdom.

Numerous theories, including resource theories, economic theories, and organisation theories, have focused on knowledge. Knowledge is one of the firm-specific intangible resources that raise the value of the input factors of production, according to Hitt et al. (2001).

Organisational knowledge can be divided into two kinds: tacit knowledge and explicit knowledge. The former is seen as the historical accumulation of people's experience, while the latter defines shared knowledge because it is accessible on common media through a system of recording, coding, storage and distribution, according to Davenport and Marchand (1999).

This study uses a structural equation model to identify the factors that influence the effectiveness of knowledge sharing to support the hypothesis that the success of the process can lead to wealth creation by improving productivity or stimulating creativity.

The study involves analysing a number of factors, including the information system, digitalisation, motivation, and management efforts, which include six processes: knowledge socialisation, internal communication, knowledge culture, internal training, knowledge leadership, and documentation, to determine how they influence knowledge sharing.

The term 'knowledge socialisation' describes the process of transmitting tacit knowledge within an organisation's employees and between different levels of staff. Feldman (1988) has characterised this process as the process by which staff members learn about the tasks they are expected to perform, how to perform them and how to work together.

According to Kataria et al. (2013), internal communication refers to a cooperative effort between management and employees to acquire information/data for the purposes of fostering positive interpersonal relationships and enhancing a sense of belonging to the company. It covers all channels of internal communication in a company.

According to Gurteen (1999), the aim of a culture of knowledge is to make the exchange of information, data and knowledge a norm within the organisation. It encourages characteristics such as flexibility, the ability to learn and relearn new things, the willingness to share knowledge, the acceptance of change, etc.

Internal training is the organisation's process of transferring information internally. It covers introductory training, ongoing training, advancement training, and refresher training. Many studies, like those by Abd Rahman et al.(2013) that have studied the effect of employee training and knowledge transfer on the organisational effectiveness.

Leadership is a process whose role is to animate knowledge management, promote the culture of sharing and involve the different stakeholders in the sharing process by creating an appropriate climate within the organisation. Several research studies have confirmed that this factor has a positive influence on knowledge management and sharing such as Shao et al. (2016a, 2016b) who suggest that the charisma of the leader has an indirect positive impact on the intrinsic motivation of individuals and on the sharing of tacit knowledge.

For Holsapple and Jones (2007), organisational documentation is a process in which concepts and information are gathered, edited, categorised and stored and which can lead to focused, precise and orderly activities in an organisation. As a sharing space, it can directly influence the quality of an organisation's activities and processes and can also contribute to the creation of new knowledge, which indirectly impacts the performance of individuals, groups and entities in all areas, including knowledge sharing.

The information system refers to its usefulness for task processing and decision making, as well as to the quality of the delivered products, including understandability and satisfaction of information needs. Several research studies have investigated its influence on performance, such as Gable et al (2003), who found that the quality of the information system affects the effectiveness of organisations. Similarly, Stone et al (2007) found that the information system affects the tasks performed by individual users.

Digitalisation refers to the process of organisational change that replaces traditional approaches with digital models. According to Vial (2019), this change influences customers' expectations and can have a significant impact on the organisation's performance. Golden (2006) suggests that organisations must use digitalisation to create professional relationships because it provides users with common and shared spaces for communication and collaboration tools. In terms of knowledge management.

Several research studies have examined its impact on knowledge management such as Machado et al (2022) who argue that digitalisation contributes to the effectiveness of knowledge sharing by creating a climate for individual and collective participation, reflection and analysis.

According to Gong et al. (2017), the motivation, takes two forms: extrinsic motivation represented by the rewards expected when performing an activity and intrinsic motivation represented by the effect of the characteristics of the activity performed on the individual. In terms of knowledge sharing, several researches have deduced the positive impact of motivation such as Tuyet-Mai et al.(2019) who concluded that the success of knowledge management depends on the implementation of tangible rewards by the organisation to their employees.

The use of structural equation models according to the PLS approach is widespread in management science. In terms of impact assessment, several researches have been conducted in marketing, human resources and knowledge management such as Payal et al. (2019) which studied the impact of knowledge management on performance and affirmed the positive effect of knowledge management and Habachi et al.(2022) who studied the impact of digitalisation on the fertility and attractiveness of the company in terms of recruitment and concluded the positive effect of digitalisation.

This study focuses on Moroccan public and semi-public sector organisations and seeks to assess the ability of these organisations to benefit from the effectiveness of the sharing process. As a result, this study proposes the following hypotheses:

**H<sub>1</sub>**: Management efforts, information system, digitalisation and motivation have a positive effect on knowledge sharing in the Moroccan public and semi-public sector.

**H<sub>2</sub>**: The information system has a mediating effect on the relationship between management efforts and knowledge sharing.

**H<sub>3</sub>**: Digitalisation has a mediating effect on the relationship between management efforts and knowledge sharing.

**H<sub>4</sub>**: Motivation mediates the relationship between management efforts and knowledge sharing.

**H<sub>5</sub>**: The information system has a moderating effect on the relationship between management efforts and knowledge sharing.

**H<sub>6</sub>**: Digitalization has a moderating effect on the relationship between management efforts and knowledge sharing.

**H<sub>7</sub>**: Motivation has a moderating effect on the relationship between management efforts and knowledge sharing.

The conceptual model defined by this study to determine the factors influencing knowledge sharing is composed of the following latent variables:

- (HS): The socialisation of knowledge.
- (KC) : Knowledge culture.
- (IT) : Internal training.
- (IC) :Internal communication.
- (KL): Knowledge leadership.
- (DC): Documentation.
- (MS): Management efforts.
- (KS): Knowledge sharing.
- (IS) : Information system.
- (DK) : Digitalisation.
- (M) : Motivation.

The conceptual model is presented in figure N°1:

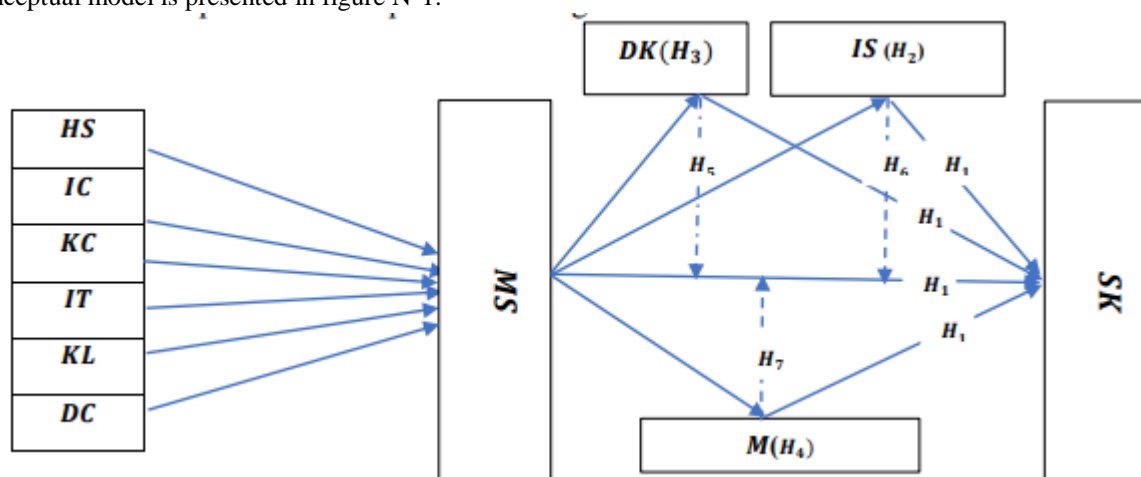


Fig 1: Conceptual model

### 3. Methodology.

This section presents the methodology that we have adopted for the empirical research. Indeed, it will be composed of the presentation of the models of the structural equations according to the PLS approach, and the constructs used.

The structural equation models distinguish between two types of models: the measurement model (outer model) which establishes the relationship between each latent variable and the associated observed variables and the structural model (inner model) which establishes the relationships between the latent variables.

The outer models used in this study are reflective models. Therefore, the relationship between each observed variable  $X_{ki}$  and the associated latent variable  $L_k$  is defined by relationship (1).

$$X_{ki} = m_{ki}L_k + \varepsilon_{ki} \tag{1}$$

with

- ✓  $Cov(\varepsilon_{ki}, L_k) = 0$ .
- ✓ if  $(k, i) \neq (m, l)$ ,  $Cov(\varepsilon_{ki}, \varepsilon_{ml}) = 0$ .

In the inner models, the linear relationship between the latent variables is defined by relationship (2).

$$L_k = \sum_{i=1}^{n_k} \beta_{ki}L_i + \eta_k \tag{2}$$

with

- ✓ if  $i \neq k$ ,  $Cov(\eta_k, L_i) = 0$ .
- ✓  $\forall (k, i), Cov(\eta_k, \varepsilon_{ki}) = 0$ .

According to Jakobowicz (2007), the external and internal estimators,  $Y_k$  et  $Z_k$  of the latent variable  $L_k$  are defined by relations (3) and (4) respectively.

$$Y_k \propto \mp X_k W_k = \sum_{i=1}^{p_k} X_{ki} W_{ki} \tag{3}$$

$$Z_k \propto \sum_{i/i \neq k, \beta_{ki} \neq 0} a_{ki} Y_i \tag{4}$$

where the symbol  $\propto$  means that the left-hand term is equal to the standardised right-hand term and  $\pm$  shows the ambiguity of the sign.

Three methods are used to estimate the internal weight  $a_{ki}$ , namely: Centroid, Factorial method and Structural method and two methods are used to update the external weights  $w_{ki}$ : method A and B. The two methods are associated with the reflective and formative model respectively.

To test the reliability and validity of the measurement model Fornell and Larcker (1981), Chin (1998) and Hair et al. (2014) define the following steps and criteria:

**Step 1:** According to Hair et al. (2014), Cronbach Alpha, Composite Reliability (CR) and Average Extracted Variance (AVE) should be used to validate the internal consistency reliability of constructs. Indeed, according to Chin (1998) and Höck and Ringle, (2006), an adequate model must verify an AVE value greater than 0.5. For Hair et al (2017, 2021), the Cronbach Alpha value must be greater than 0,70 and for composite reliability, models are considered "satisfactory to good" if the values are greater than 0,7 while for "exploratory research", models are "acceptable" if the composite reliability between 0,60 and 0,70.

**Step 2:** This stage is reserved for examining the discriminant and convergent validity of constructs. Using the criteria of Fornell and Larcker (1981), Hair et al. (2014) suggest that the construct must share more variance with its indicators than with any other construct. Then, it should be checked that the loadings of each indicator on its construct are higher than the cross loading on the other constructs (cross loading).

The validity of structural models is done using the Hair et al. (2014) criteria, namely:

- The trajectory coefficients using the T-statistic and the multiple  $R^2$  which must be greater than 0,1 to consider that the relationship defined by the model is significant.
- Communality, which represents the proportion of the variance of the observed variables explained by their associated latent variable.
- The effect size ( $f^2$ ) which measures the quality of the model, is considered by Cohen (1988), Chin (1998) and Hair (2014) to be small, medium or large respectively if the values of  $f^2$  are in the range of 0,02, 0,15 and 0,35. respectively.
- The Stone-Geisser coefficient  $Q^2$  (cross-validation redundancy index), using the estimated structural model, makes it possible to test the cross-validation between the observed variables of an endogenous latent variable and all the observed variables of the latent variables explaining this latent variable. Indeed, according to Fernandes (2012), if  $Q_k^2 > 0$  the model has predictive validity.
- The Goodness-of-fit (GoF) index which represents the overall validation. Indeed, the global validation is considered as average if GoF is higher than 0,25 whereas it is considered as very large if GoF is higher than 0,36.

The mediating role of a latent variable ( $L_m$ ) is observed when it absorbs the effect of an exogenous latent variable ( $L_i$ ) on an endogenous latent variable ( $L_k$ ). For Preacher and Hayes (2008), the mediating role is assured if the relationships between  $L_i$ ,  $L_m$  and  $L_k$  are significant (p-value < 0,05) and the lower and upper leverage do not cross 0.

With regard to the moderation effect, according to Borau et al. (2015), the variable  $L_m$  moderates the influence of the latent variable  $L_i$  on the variable  $L_k$  if it impacts the nature, direction and/or strength of that influence. The moderating role is determined by the path coefficient  $\beta$  and the T-statistic that the moderating role is asserted if the p-value is less than 0,05.

The constructs and their sources are defined in Table 1, while the items are presented in Appendix 2.

Table N° 1 : The constructs

Constructs		Definition and Source
S	K	HS
		The employee learning process which allows employees to learn the tasks they are required to do and how to do them, as well as teamwork including sharing knowledge with line management.

	Balci et al (2016) used this factor to study the level of socialisation in the education sector in Turkey. He concluded that there is a significant and moderately positive relationship between organisational socialisation and organisational performance and Zahidul(2010) who studied the effect of socialisation on knowledge sharing and concluded that organisational socialisation has an important effect on knowledge sharing.
KC	A system of values shared by the members. In the area of knowledge, socialisation and sharing must be common standards of the organisation. Bharadwaj et al (2015) who used knowledge culture as a component of knowledge infrastructure capabilities to study the impact of knowledge management capabilities on knowledge management effectiveness.
IC	The process of managing all forms of communication within an organisation in order to strengthen a sense of belonging and promote the sharing of information and knowledge. This variable was used by Reis Neto et al.(2018) who concluded that internal communication impacts performance, Qin and Men (2022) who studied the psychological well-being of employees and concluded the positive influence of internal communication and Hooff and de Ridder (2004) who studied the influence of communication climate on knowledge sharing and concluded the positive effect of communication climate on this process
IT	The process by which individuals improve their skills, knowledge, attitudes and/or behaviour. It encompasses the different forms of training (induction, maintenance, upgrading, promotion and retraining). Buonomo et al.(2022) who studied the impact of employees' perception of vocational training on knowledge sharing and concluded the positive effect of the former factor on the latter.
KL	The process of animating and promoting the knowledge culture and sharing within the organisation. This variable was used by Mas-Machuca (2014) to study the positive relationship between leadership and knowledge management success and concluded that leadership is positively related to the success of knowledge management practice. Al-husseini (2019) used it to study the relationship between transformational leadership, knowledge sharing and product innovation.
DC	All information and knowledge storage media, whether digital or otherwise. Farah et al. (2018) have used to study the impact of the knowledge documentation process as an intermediary between the knowledge acquisition process, organisational culture and human capital performance
IS	The contribution of the information system to treatment and decision making and its capacity to provide users with quality and usable material that meets their needs. This variable was used by Hayati et al.(2021) to determine the effect of the implementation of information systems on the quality of governance and its impact on the performance of the university organisation and Mirzaee, S. and Ghaffari, A. (2018) who have studied the impact of the information system on knowledge sharing and concluded that they play an important role in knowledge sharing
D	This is the set of organisational changes to introduce digital media and tools in the objective of facilitating access, availability and circulation of knowledge. Ramírez et al.(2022) studied the effect of digitalisation on three variables which are knowledge management, business innovation and organisational performance and stated the positive impact of digitalisation on performance and Habachi et al.(2022) cited in literature review.
M	The motivation is the set of rewards and incentives provided by the organisation to motivate staff to share their knowledge. Tuyet-Mai Nguyen et al.(2019) who studied the direct and moderating effects of motivation on knowledge sharing and concluded that both extrinsic and intrinsic motivators have high positive effects on knowledge sharing and Hau et al.(2013) who studied the effect of motivation and social capital on knowledge sharing and concluded the positive effect of two components of motivation and social capital on knowledge sharing.
KS	The process by which explicit or tacit knowledge is communicated to other individuals. It represents all the material and human means put in place to promote the free circulation of knowledge. Siregar and Aryusmar (2019) who investigated the benefits of the discussion forum as a process for transforming tacit knowledge into explicit knowledge through the knowledge management portal and concluded that the discussion forum has a positive effect on the willingness to share knowledge (SK), Anselmann and Mulder (2020) who studied the relationship between transformational leadership, team safety, knowledge sharing and reflection, and team performance and concluded that transformational leadership has a direct positive relationship with the team safety climate, and that the team safety climate has positive relationships with knowledge sharing and reflection.

The management efforts (MS) are measured by two items MS1 and MS2 which represent, respectively, the mode and median of the latent variables *HS*, *IC*, *KC*, *IT*, *KL* and *DC*

#### 4. Results.

The empirical study is based on a sample of 96 respondents from different public and semi-public organisations, broken down by sector in Table 2.

able N° 2 : Distribution of the sample by sector

Sector	Nbre	%
Public administration	31	32,3%
Insurance	2	2,1%
Bank	25	26,0%
Ministerial departments	1	1,0%
Education	15	15,6%
Finance, Treasury	1	1,0%
Justice	2	2,1%
Health	7	7,3%
Others	12	12,5%
	96	100,0%

The survey is conducted among people of different levels of education. The percentage of women is 25.71%. The distribution by age group is shown in Table N° 3.

Table N° 3 : Distribution of the sample by age class

Age class	Nbre	%
Less than 25 years	10	10,4%
25-35	34	35,4%
40-50	19	19,8%
35-40	10	10,4%
More than 50 years	23	24,0%
	96	100%

The distribution by educational level is presented in Table N° 4.

Table N° 4 : Distribution by educational level

Educational level	Nbre	%
Doctorate	20	20,8%
BAC +5 (Master, engineer, ....)	31	32,3%
Bac+3 or Bac+4	3	43,8%
Bac+2	42	3,1%
	96	100,0%

The distribution by seniority in post is shown in Table N° 5.

Table N° 5 : Distribution by seniority

Seniority	NBRE	%
Less than 5 years	29	30,2%
5-10	17	17,7%
10-15	14	14,6%
15-25	19	19,8%
More than 25 years	17	17,7%
	96	100%

The analysis of the data allowed for the determination of structural and measurement models. The estimation of these models is given in Figure 2.

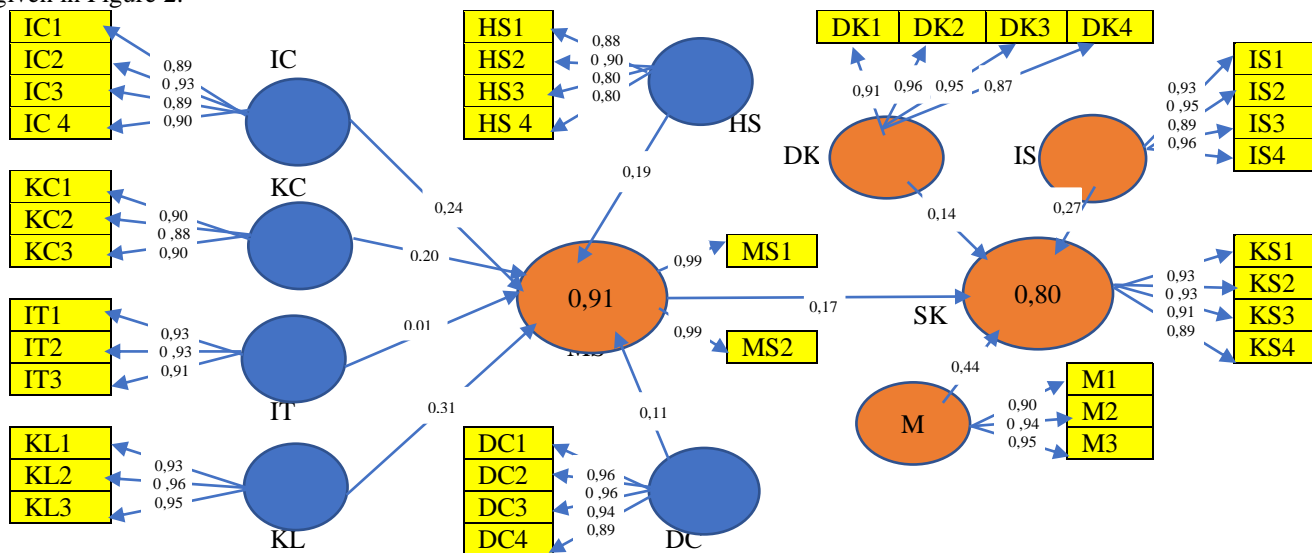


Fig 2 : The estimation of models

The validity of the measurement models is done by cronbach alpha, composite reliability and average variance extracted (AVE). The values of the three indicators are presented in Table N° 6.

Table N° 6 : The discriminant validity of constructs

Construct	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)

DC	0,95	0,96	0,97	0,88
DK	0,94	0,95	0,96	0,85
HS	0,86	0,87	0,91	0,71
IC	0,91	0,92	0,94	0,80
IS	0,95	0,96	0,97	0,87
IT	0,92	0,92	0,95	0,85
KC	0,74	0,79	0,85	0,84
KL	0,94	0,94	0,96	0,89
SK	0,93	0,94	0,95	0,84
M	0,93	0,93	0,95	0,87
MS	0,98	0,98	0,99	0,98

Table N° 6 shows that the AVE values are higher than 0,5 and the Cronbach's alpha and composite reliability values are higher than 0,7, which means respectively that the selected constructs fulfil the statistical conditions for the reliability of the selected items. Therefore, the measurement scales are valid.

The R<sup>2</sup> coefficient shows that the variable "Management efforts" is 91% explained by the latent variables "Knowledge socialization", "knowledge culture", "internal training", "internal communication", "knowledge leadership", "documentation" and that the "knowledge sharing" variable is 80% explained by the variables "management efforts", "digitalisation", "information system" and "motivation".

Fornell and Larcker's criteria for construct discriminant validity are presented in Table N° 7.

Table N° 7 : Fornell and Larcker criterion

Construct	DC	DK	HS	IC	IS	IT	KC	KL	KS	M	MS
DC	0,94										
DK	0,74	0,92									
HS	0,66	0,62	0,84								
IC	0,78	0,72	0,83	0,89							
IS	0,81	0,80	0,64	0,77	0,94						
IT	0,63	0,51	0,57	0,65	0,59	0,92					
KC	0,74	0,65	0,73	0,80	0,72	0,66	0,81				
KL	0,71	0,68	0,71	0,81	0,76	0,75	0,76	0,94			
M	0,61	0,57	0,60	0,68	0,66	0,54	0,65	0,75	0,93		
MS	0,79	0,72	0,83	0,88	0,77	0,70	0,80	0,87	0,67	0,99	
SK	0,74	0,72	0,67	0,80	0,80	0,64	0,78	0,81	0,81	0,77	0,91

Table N° 7 shows that discriminant validity of all constructs is confirmed by the fact that the average extracted variance (AVE) of the three constructs is greater than the square of the correlations of these constructs with the other latent variables of the model. The discriminant validity of all latent variables is confirmed by Table 1 in Appendix 1. Indeed, the variables do not overlap and share more variance with their own items than with those of other latent variables.

The latent variable MS is expressed as a function of "knowledge socialisation", "knowledge culture", "internal training", "internal communication", "knowledge leadership" and "documentation" by the formula (5).

$$MS = 0,19 * HS + 0,24 * IC + 0,20 * KC + 0,31 * KL + 0,11 * DC + 0,01 * IT \tag{5}$$

To evaluate structural models, the empirical results of the direct effects and hypothesis tests are presented in Figure N° 3.

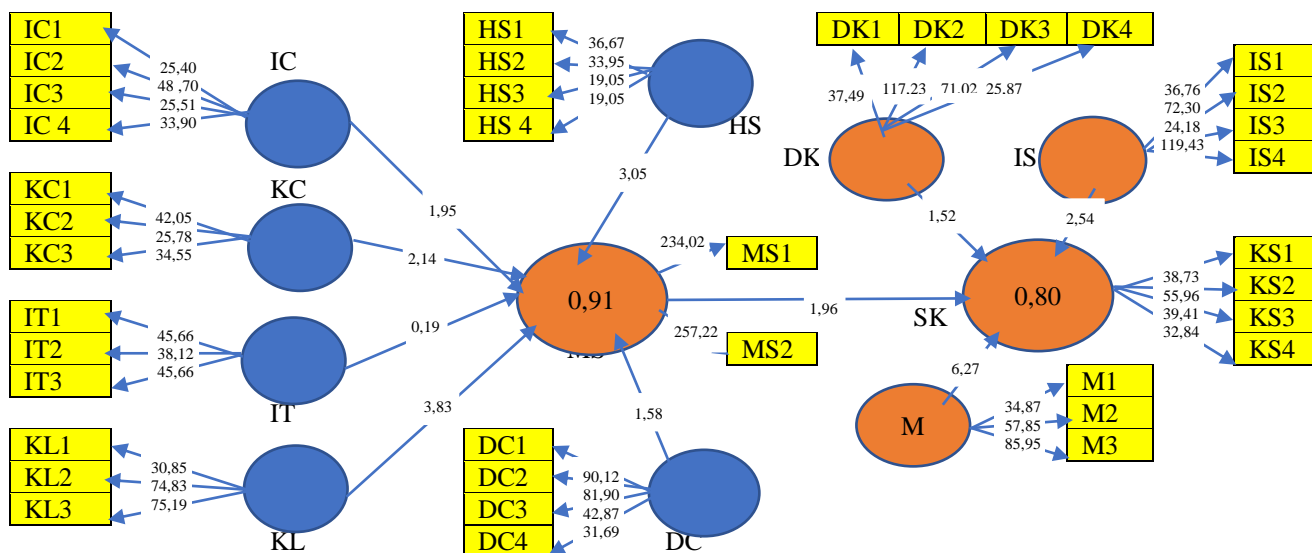


Fig N°3 : The direct effects

The path coefficients show that management efforts, motivation and the information system have a positive effect on knowledge sharing. The T-statistic values are respectively 1,96, 2,54 and 6,27 above or equal to the critical value of 1,96. With T-

statistic equal to 1,52, the impact of digitalisation on knowledge sharing is not confirmed. This variable will be removed from the initial model. Consequently, the new model is defined by figure N°4.

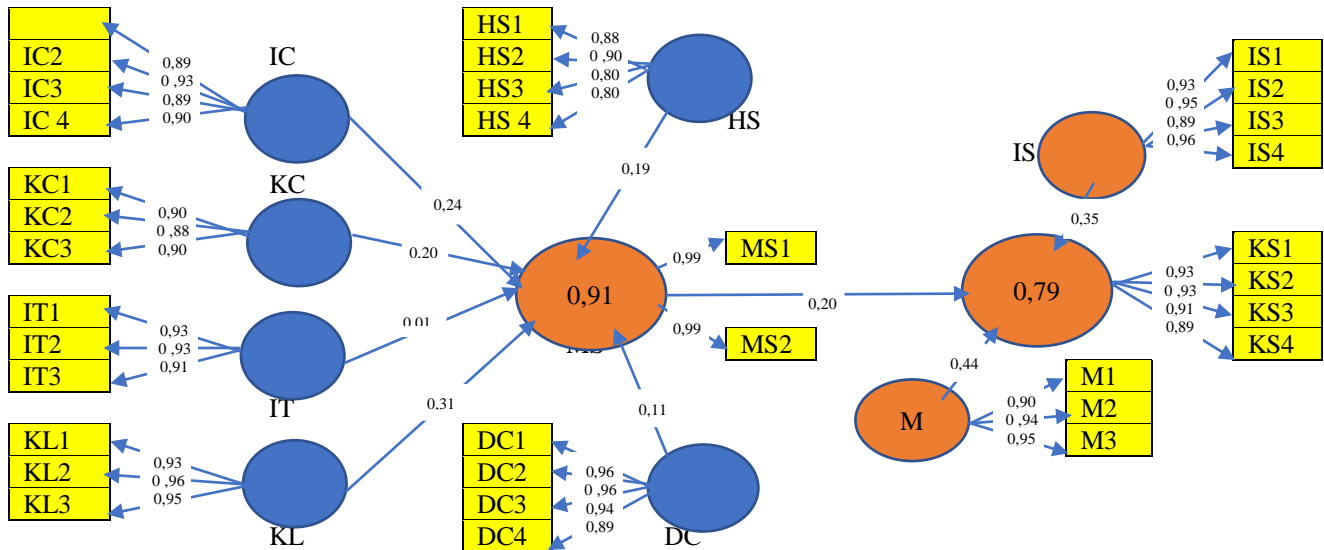


Fig 4: Estimation of the adjusted model

To evaluate structural models, the empirical results of the direct effects and hypothesis tests are presented in Figure N° 5.

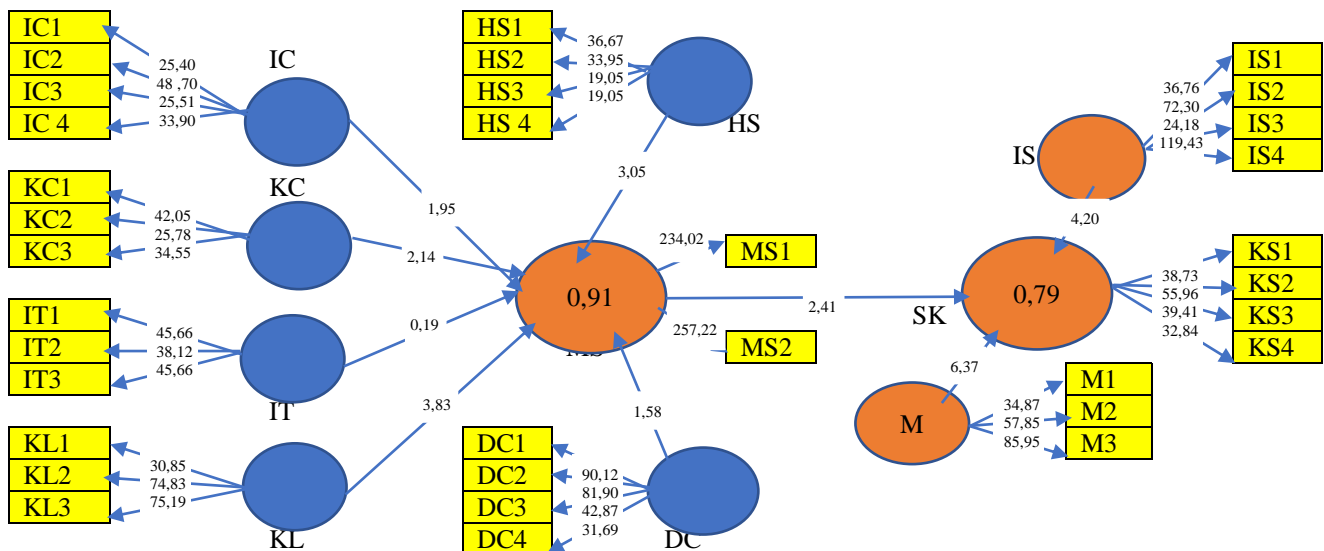


Fig N°5 : The direct effects

The  $R^2$  coefficient of the relationship between  $MS$  and its components ( $HS, IC, KC, IT, KL, DC$ ) is 0,91, and the  $R^2$  coefficient of the relationship between  $SK$  and its determinants ( $MS, M, IS$ ) is 0,79, which means that the structural models are significant (substantial).

The  $f_k^2$  values of the exogenous variables  $MS, M, IS$  that explain the endogenous variable  $SK$  are respectively 0,07; 0,48 and 0,22. This shows that management effort has a small effect on knowledge sharing, motivation has a large effect and the information system has a moderate effect.

The  $Q^2$  value is greater than zero, i.e. 0,781, which means that the model is predictive in nature. The table N° 2 in Appendix 1 presents the calculation of GoF. Indeed, the value is equal to 1,304 which means that the overall PLS validity of the model is sufficiently large.

These results make it possible to express the sharing of knowledge as a function of the variables "Management effort", "Information system" and "Motivation" by formula (6).

$$SK = 0,20 * MS + 0,35 * IS + 0,44 * M \tag{6}$$

The steps of the information system mediation study are as follows:

The indirect relationship between  $MS$  and  $SK$  is significant (with a  $\beta$  equal to 0,4 and standard deviation equal to 0,08) because the p-value is less than 0,05 ( $P=0,000$ ) which is equivalent to a T-statistic equal to 5,22.

The total effects are significant for all three relationships with  $p < 0,05$ . Indeed, the :

- The  $MS \rightarrow IS$  relationship is significant (with a  $\beta$  equal to 0,77 and standard deviation equal to 0,04) because the p-value is less than 0,05 ( $p=0,000$ ) which is equivalent to a T-statistic equal to 17,27.



- The  $MS \rightarrow SK$  relationship is significant (with a  $\beta$  equal to 0,77 and standard deviation equal to 0,04) because the p-value is less than 0,05 ( $p=0,000$ ) which is equivalent to a T-statistic equal to 17,45.
- The  $IS \rightarrow SK$  relationship is significant (with a  $\beta$  equal to 0,51 and standard deviation equal to 0,10) because the p-value is less than 0,05 ( $p=0,000$ ) which is equivalent to a T-statistic equal to 5,36.

The last step consists in calculating the lower and upper leverage, Indeed, the second condition is verified since the lower lever (LL) is equal to (0,26) and the upper lever (UL) is equal to 0,44. Consequently, the hypothesis  $H_2$  cannot be rejected and the study states that the information system justifies a significant mediating role between "management efforts" and "knowledge sharing".

The steps of the digitalization mediation study are as follows:

The indirect relationship between MS and SK is significant (with a  $\beta$  equal to 0,25 and standard deviation equal to 0,06) because the p-value is less than 0,05 ( $P=0,000$ ) which is equivalent to a T-statistic equal to 3,94.

The total effects are significant for all three relationships with  $p < 0,05$ , Indeed, the :

- The  $MS \rightarrow DK$  relationship is significant (with a  $\beta$  equal to 0,72 and standard deviation equal to 0,05) because the p-value is less than 0,05 ( $p=0,000$ ) which is equivalent to a T-statistic equal to 13,27.
- The  $MS \rightarrow SK$  relationship is significant (with a  $\beta$  equal to 0,77 and standard deviation equal to 0,04) because the p-value is less than 0,05 ( $p=0,000$ ) which is equivalent to a T-statistic equal to 17,50.
- The  $DK \rightarrow SK$  relationship is significant (with a  $\beta$  equal to 0,35 and standard deviation equal to 0,08) because the p-value is less than 0,05 ( $p=0,000$ ) which is equivalent to a T-statistic equal to 4,30.

The second condition is verified since the lower lever (LL) is equal to (0,14) and the upper lever (UL) is equal to (0,36). Consequently, the hypothesis  $H_3$  cannot be rejected and the study states that the digitalization justifies a significant mediating role between "management efforts" and "knowledge sharing".

The steps of the motivation mediation study are as follows:

The indirect relationship between MS and SK is significant (with a  $\beta$  equal to 0,35 and standard deviation equal to 0,06) because the p-value is less than 0,05 ( $P=0,000$ ) which is equivalent to a T-statistic equal to 6,19.

The total effects are significant for all three relationships with  $p < 0,05$ , Indeed, the :

- The  $MS \rightarrow M$  relationship is significant (with a  $\beta$  equal to 0,67 and standard deviation equal to 0,05) because the p-value is less than 0,05 ( $p=0,000$ ) which is equivalent to a T-statistic equal to 12,50.
- The  $MS \rightarrow SK$  relationship is significant (with a  $\beta$  equal to 0,77 and standard deviation equal to 0,05) because the p-value is less than 0,05 ( $p=0,000$ ) which is equivalent to a T-statistic equal to 16,74.
- The  $M \rightarrow SK$  relationship is significant (with a  $\beta$  equal to 0,53 and standard deviation equal to 0,08) because the p-value is less than 0,05 ( $p=0,000$ ) which is equivalent to a T-statistic equal to 6,78.

The second condition is verified since the lower lever (LL) is equal to (0,25) and the upper lever (UL) is equal to 0,47. Consequently, the hypothesis  $H_4$  cannot be rejected and the study states that the Motivation justifies a significant mediating role between "management efforts" and "knowledge sharing".

Empirical tests of the moderating effect of the variables "IS", "DK" and "M" on the relationship between "Management efforts" and "Knowledge sharing" are presented in Table N°8.

Table N° 8: Moderating effect

	$\beta$	Std.dev	T-statistic	p-value
Moderating effect $IS \rightarrow SK$	0,14	0,06	2,43	0,02
Moderating effect $DK \rightarrow SK$	0,09	0,05	1,90	0,06
Moderating effect $M \rightarrow SK$	0,02	0,05	0,42	0,67

The previous results show that the information system moderates the relationship between management efforts and knowledge sharing ( $p=0,02 < 0,05$ ), which validates hypothesis  $H_5$ , On the other hand, hypotheses  $H_6$  and  $H_7$  are rejected ( $p=0,06$  and  $p=0,67$ ), which excludes the moderating role of the digitisation and motivation factors.

## 5. Discussion.

The results of the study identified the determinants of the effectiveness of knowledge sharing. Indeed, several processes were identified as factors that have a positive influence on the performance of the sharing process such as knowledge socialisation, internal communication, training, documentation, knowledge culture and leadership as well as information system performance and motivation. The validation tests of the direct positive effect were validated by SEM-PLS and the statistical tests presented in the methodology.

Knowledge sharing is explained by management effort, motivation and information system at the level of 79% while the management effort is explained at 91% by its components defined by the model.

For the effect of the information system and motivation factors on the relationship between "management efforts" and "knowledge sharing", the study showed that the information system can have a mediating and moderating role on this relationship whereas motivation has only a mediating role as the p-value for the moderating role is equal to 0,67 (above the 0,05 threshold).

These results confirm the research findings presented in the literature review and the sources used to define the constructs including Zahidul (2010), Bharadwaj et al (2015), Hooff and de Ridder (2004), Buonomo et al (2022), Al-husseini (2019), Mirzaee, S. and Ghaffari, A. (2018) and Tuyet-Mai Nguyen et al (2019).

On the contrary, the effect of digitalisation was not approached by the study, knowing that it is an important axis of the public sector reform. Several factors may justify this observation, notably the composition of the sample in terms of age and level

of education, as well as the reluctance. Therefore, we suggest that the effect of digitisation should be the subject of a confirmatory study by raising the limitations of this study, notably the sample size.

## 6. Conclusion

In the context of the reform of the Moroccan public and semi-public sector, in particular the development of the information system, the development of human capital and the digital transformation, the knowledge patrimony as well as its management are becoming a major focus and an important area of management for the managers of the sector. Knowledge sharing, as a key process for building knowledge capital, must be efficient to ensure the acquisition, reliability and free circulation of knowledge.

The aim of this study was to determine the factors that influence the performance of the knowledge sharing process and that can moderate its effectiveness. As a result, it has shown that several processes contribute to the performance of the sharing process, notably socialisation, internal communication, internal training, documentation, culture and leadership of knowledge, the information system and motivation.

For digitalisation, the results of the study are in contradiction with numerous research studies that have confirmed its positive influence on both performance and knowledge management, as well as with Morocco's orientations regarding digital transformation. Therefore, future research in this area must examine the impact of digitisation, taking into consideration some of the limitations of this research, such as the modelling method, sample size and online data collection.

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## APPENDIX 1: Tables and Figures

### 1 . The tables

Table 1 : Cross loading

	DC	HS	IC	IS	IT	KC	KL	M	SK
DC1	0.96	0.64	0.74	0.73	0.59	0.68	0.64	0.56	0.69
DC2	0.96	0.63	0.73	0.77	0.62	0.70	0.67	0.58	0.72
DC3	0.94	0.64	0.75	0.78	0.59	0.76	0.67	0.63	0.73
DC4	0.89	0.55	0.69	0.74	0.57	0.63	0.68	0.53	0.63
HS1	0.61	0.88	0.74	0.57	0.53	0.64	0.66	0.52	0.62
HS2	0.53	0.90	0.71	0.54	0.44	0.63	0.60	0.55	0.56
HS3	0.43	0.80	0.68	0.49	0.50	0.65	0.61	0.50	0.54
HS4	0.65	0.80	0.68	0.57	0.45	0.53	0.52	0.46	0.50
IC1	0.69	0.74	0.89	0.66	0.56	0.70	0.71	0.59	0.68
IC2	0.71	0.80	0.93	0.70	0.61	0.79	0.74	0.60	0.71
IC3	0.63	0.74	0.89	0.71	0.57	0.76	0.75	0.64	0.74
IC4	0.76	0.69	0.85	0.69	0.57	0.72	0.68	0.60	0.72
IS1	0.76	0.58	0.72	0.93	0.53	0.67	0.71	0.59	0.77
IS2	0.79	0.63	0.76	0.95	0.60	0.73	0.74	0.68	0.77
IS3	0.68	0.54	0.64	0.89	0.53	0.55	0.67	0.56	0.66
IS4	0.78	0.64	0.76	0.96	0.54	0.71	0.73	0.64	0.78
IT1	0.58	0.49	0.56	0.50	0.93	0.58	0.65	0.43	0.53
IT2	0.55	0.48	0.53	0.50	0.93	0.53	0.63	0.42	0.50
IT3	0.62	0.59	0.69	0.62	0.91	0.69	0.78	0.64	0.71
KC1	0.67	0.72	0.82	0.72	0.60	0.90	0.76	0.67	0.77
KC2	0.64	0.59	0.67	0.56	0.59	0.88	0.64	0.52	0.62
KC3	0.47	0.42	0.49	0.43	0.38	0.90	0.40	0.34	0.47
KL1	0.64	0.67	0.77	0.72	0.71	0.74	0.93	0.66	0.73
KL2	0.70	0.65	0.77	0.72	0.69	0.71	0.96	0.73	0.79
KL3	0.67	0.70	0.75	0.72	0.73	0.72	0.95	0.73	0.76
M1	0.57	0.59	0.64	0.63	0.50	0.59	0.71	0.90	0.74
M2	0.58	0.53	0.61	0.61	0.45	0.58	0.65	0.94	0.75
M3	0.58	0.58	0.66	0.61	0.58	0.63	0.74	0.95	0.78
SK1	0.67	0.52	0.69	0.70	0.52	0.67	0.69	0.74	0.93
SK2	0.64	0.65	0.73	0.75	0.59	0.71	0.77	0.78	0.93
SK3	0.66	0.52	0.67	0.70	0.59	0.67	0.71	0.72	0.91
SK4	0.74	0.73	0.81	0.78	0.63	0.81	0.77	0.72	0.89

Table 2: GOF

Latent variable	AVE	R <sup>2</sup>
DC	0,88	
HS	0,71	
IC	0,8	
IS	0,87	
IT	0,85	
KC	0,84	
KL	0,89	
M	0,84	
MS	0,87	0,91
SK	0,98	0,79
The average	0,853	0,85

$$GoF = \sqrt{H^2 \times \overline{R^2}} = 1,304$$

## APPENDIX 2: Items

CONSTRUCT		ITEMS	ITEM CODE
<b>Management Effort</b>	The socialisation of knowledge (HS)	My line manager encourages knowledge sharing	SH1
		My line manager shares all new knowledge in a timely manner	SH2
		My line manager organises knowledge sharing sessions	SH3
		I have access to knowledge whenever I need it	SH4
	The culture of knowledge (KC)	My organisation's internal communication promotes knowledge sharing.	KC1
		My organisation's internal communication enables knowledge to be shared regularly.	KC2
		My organisation's internal communication enables knowledge to be shared in a timely manner (in real time).	KC3
		My organisation's internal communication provides access to knowledge of all internal activities.	KC4
	Internal communication (IC)	The culture of my organisation encourages trust and knowledge sharing.	IC1
		All levels of my organisation are committed to promoting knowledge sharing.	IC2
		In my organisation, knowledge hoarding is not a power.	IC3
	Internal training (IT)	My organisation organises training for knowledge sharing.	IT1
		The training organised by my organisation promotes knowledge sharing.	IT2
		The training materials organised by my organisation are rich and allow for effective knowledge sharing.	IT3
	Knowledge leadership (KL)	Knowledge leadership is an effective mechanism for sharing information in my organisation.	KL1
		My organisation's leadership system is effective in promoting knowledge sharing	KL2
		My organisation's leadership system links all activities in promoting knowledge sharing	KL3
	The documentation (DC)	Documentation in my organisation enables knowledge sharing.	DC1
		Documentation in my organisation enables regular knowledge sharing.	DC2
		Documentation in my organisation enables knowledge to be shared in a timely manner (real time).	DC3
Documentation in my organisation allows access to knowledge of all internal activities.		DC4	
Information system (IS)	my organisation's information system effectively participates in the sharing and socialisation of knowledge	IS1	
	the design of my organisation's information system facilitates access to knowledge at all levels of the hierarchy	IS2	
	my organisation's information system is regularly updated to enable the sharing of up-to-date knowledge	IS3	
	my organisation's information system provides timely access to necessary knowledge	IS4	
Digitalization (DK)	Digitalisation enables knowledge sharing in my organisation.	DK1	

	Digitalisation enables knowledge to be shared regularly in my organisation.	DK2
	Digitalisation enables knowledge to be shared in a timely manner (in real time) in my organisation.	DK3
	Digitalisation allows access to knowledge of all internal activities.	DK4
Motivation(M)	My organisation rewards people for sharing their knowledge.	M1
	My organisation integrates knowledge sharing into the performance appraisal process of staff.	M2
	My organisation integrates knowledge sharing into the internal job promotion process.	M3
Sharing knowledge (KS)	My organisation's arrangements encourage me to share knowledge with my colleagues.	SK1
	The sharing incentives in my organisation encourage knowledge sharing	SK2
	The channels of exchange set up by my organisation encourage me to share knowledge.	SK3
	The culture of my organisation encourages me to share knowledge.	SK4