Accounting and Management Information Systems
Vol. 14, No. 3, pp. 575-590, 2015

Knowledge sharing behaviour of Bosnian enterprises

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Abstract: Knowledge Management has emerged as a useful tool for sustainability of organizational competitiveness. Beside the importance of achieving knowledge, sharing the existing knowledge is accepted as a key element for organizational success. The main purpose of this research is to investigate the influence of Knowledge sharing behaviour of Bosnian enterprises, supported by a socio-technical knowledge sharing environment, on the individual and organizational performance. In order to test the proposed model, a 7-point Likert scale survey is conducted within various Bosnian private and public enterprises. Finally, the collected data is used to test the model by structural equation modelling. The results provide that knowledge sharing practices improve organizational and individual performance by developing a socio-technical knowledge sharing environment. Moreover, this study is expected to enrich knowledge management literature in Bosnian marketplace and neighbourhood countries which have similar characteristics.

Keywords: knowledge management, knowledge sharing, socio-technical environment, individual performance, organizational performance, structural equation modelling

JEL codes: D83

1. Introduction

Knowledge, its management and its products have never been important as they are in this age. We call this age as knowledge age, its economy as knowledge economy, its society as knowledge society, the ones who creates knowledge as

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knowledge worker, etc. Beside the importance of knowledge itself, its production, management and dissemination (sharing) are important. Therefore, the organizational ability to identify, capture, create, share or accumulate knowledge become important (Nonaka & Takeuchi, 1995). The flow of knowledge through individuals and organizations, and organizational practices are strongly dependent upon individuals' knowledge sharing (KS) behaviour (Bock et al., 2005) as one of the fundamental objectives of Knowledge Management in maximizing the flow of existing knowledge. Successful Knowledge sharing is supposed to enhance organizational performance (Argote *et al.*, 2000; Alavi & Leidner, 2001).

This study targets Bosnian companies as the subject population. Individual knowledge workers, especially decision makers, in Bosnian public and private enterprises are targeted for the survey. It is observed that Knowledge Management/sharing literature for Bosnian organizations is weak. It may be interesting to see the knowledge sharing behaviour of Bosnian enterprises after the problems they faced within last two decades (the war, political and economic instabilities). Few Knowledge Management studies about Bosnia and Herzegovina in the literature mostly focus on the implementation level of Knowledge Management and its adoption. They report weak levels of knowledge management understandings in Bosnian organizations (Handzic *et al.*, 2007; Biloslavo & Kljajic-Dervic, 2011; Bartlett *et al.*, 2012; Ozlen *et al.*, 2012) and suggest more in order to enhance Knowledge Management success in terms of measurement and technology (Handzic *et al.*, 2007) and Knowledge Management strategies (Ozlen *et al.*, 2012). This research proposes and empirically tests a knowledge sharing model with the dimensions of Knowledge Sharing (KS), Socio-Technical Knowledge Sharing Environment (KSE) and Organizational and Individual Performances by employing a structural equation modelling (SEM). The results may guide Bosnia and Herzegovina and neighbourhood countries which have similar characteristics in developing successful KM and KS behaviour.

Further sections of the paper introduce the relevant literature, the research model and hypothesized relationships among the research variables, the research methodology, and the findings. Finally, the last section is used to discuss the results and to conclude the paper with the implications for the research and practice.

2. Literature Review

2.1. Supportive socio-technical environment

The factors such as culture, structures, and technology are suggested by the scholars as the environmental antecedents for knowledge sharing (Alavi *et al.*, 2006).

KM is concerned with social (Ribiere and Sitar, 2003) and/or technical (Tsui, 2003) factors in enhancing knowledge processes and therefore increases working knowledge and finally affects performance. Handzic (2011) suggests networked structures with modern technologies for open communication and knowledge acquisition. Therefore, she proposes an integrated socio-technical knowledge management (KM) model in order to determine the relative importance of social and technical initiatives in organizational KM. She identifies that social factors have greater importance than technical factors in increasing organizational knowledge and recommends developing a knowledge sharing conducive culture through a variety of measures such as rewards and incentives, and ensuring management commitment.

Hansen *et al.* (1999) recommend considering KM technologies and organizational culture as a knowledge sharing facilitator in enhancing the interactions among knowledge workers. O'Dell and Hubert (2011) suggest that supportive social and technical environment, even if geographically dispersed, enhances the collaboration among the people in achieving their goals through exploitation. Liu, Olfman and Ryan (2005) recommend effective collaboration of organizational members for KM success in a virtual enterprise. They also suggest the evaluation of social relationships among individuals for successful collaboration.

According to Alavi and Leidner (1999), organizational culture is accepted as an important factor for KM success. Moreover, individualistic cultures are generally found to be supportive for knowledge acquisition, while cooperative cultures support knowledge sharing. According to Davenport et al. (1998), the key factors for successful projects are knowledge friendly culture and top management support. Fink (2000) also suggests effective organizational management as an important factor to generate an enabling environment for knowledge generation and to support collaboration and knowledge sharing. O'Dell and Hubert (2011) suggest developing a knowledge sharing culture as the best strategy for KM program by (1) Leading by example; (2) Branding KM by kind messaging, formal communications, rewards and recognition and (3) Making KM fun.

Technology is also recognized as extremely important in facilitating knowledge sharing and has a critical role in creating, storing and distributing explicit knowledge in an accessible and quick manner by the help of knowledge repositories, data mining and decision support systems (Hahn and Subramani, 2000) in order to establish a knowledge sharing platform. Liu *et al.* (2005) recommend a flexible corporate infrastructure for enterprise-based knowledge management systems to operate and support collaborations.

Another dimension as an enabler of knowledge sharing is sharing motivation. Oye *et al.* (2011) report that knowledge sharing in workplace can be influenced by both

motivators and demotivators. Gu and Gu (2011) suggest the role of motivation aspect in successful knowledge sharing. Teh and Yong (2011) observe that Individuals' knowledge sharing behaviour is influenced by intention to share knowledge. They suggest managers enhancing intrinsic motivation among employees, and developing better joint relationships and interpersonal interactions among employees to facilitate successful knowledge sharing. Teng and Song (2011) suggest voluntary sharing behaviour for increasing performance.

Lastly, O'Dell and Hubert (2011) state that that people are the key element of KM, since (1) sharing and learning are social activities among people, (2) technology can hold descriptions involving complex cultural and contextual elements, (3) connecting employees and allowing them to share their deep, rich, tacit knowledge in order to guarantee the effective sharing and transfer of the practices. They suggest mutual obligation, reciprocity and individual motivation as the most powerful social forces through the organizations for successful knowledge sharing.

Consequently, this study considers supportive socio-technical knowledge sharing environment as the initial construct including social, technical and motivational dimensions in order to enhance Knowledge Sharing.

2.2. Knowledge sharing

Knowledge sharing practices are supposed to be very valuable in possessing and improving intellectual capital and therefore organizational success. Pugna and Boldeanu (2014) suggest exchanging knowledge capital among people in order to enhance itself and increase organizational benefits. Therefore, Knowledge sharing is one of the fundamental concerns of Knowledge Management activities. Heisig (2009) report that knowledge sharing is most frequently used in KM activities (31 of the analysed 117 KM frameworks).

By considering Polanyi's (1966) conceptualization, Nonaka and Takeuchi (1995) propose their SECI model (Socialization, Externalization, Combination, and Internalization) in order to explain tacit and explicit knowledge sharing in the knowledge creation process. Knowledge sharing transforms organizational knowledge into individual or group knowledge through internalization and socialization however transforms individual and group knowledge into organizational knowledge through externalization and combination.

Vygotsky's (1978) socio-cultural theory of learning suggests that knowledge is acquired and represented through knowledge sharing and social interaction by the social/individual and the public/private mechanisms. O'Dell and Hubert (2011) advise that the winners in the marketplace are usually knowledge-sharing cultures that can continuously value from their intellectual assets. They suggest individuals freely create, share, and use information and knowledge in a collaborative

environment toward a common goal and therefore, achieve their work objectives, do their jobs quicker and systematically, and be recognized by their peers and mentors as the key contributors and experts.

Wang and Noe (2010) suggest knowledge sharing as a fundamental knowledge-centered activity through which employees can mutually exchange their knowledge and contribute to knowledge application and ultimately the competitive advantage of the organization. This research evaluates knowledge sharing behaviour as the central variable of the proposed research model.

2.3. Performance variables

Knowledge sharing activities in organizations are found to be on organization level or individual level and critical for both levels in order to obtain KM success.

Knowledge sharing (KS) has been a common concern of researchers for the organizational dimension of KM including KS effectiveness in knowledge networks (Hansen, 2002), KS impact on individual performance (Teigland & Isko, 2003) and contribution to the organizational performance (Argote *et al.*, 2000).

Wang and Wang (2012) assume that knowledge sharing has direct positive impact on performance by increasing innovation and therefore contributing to the firm performance. They identify that both explicit and tacit knowledge sharing practices influence innovation and performance. Explicit knowledge sharing is found to have more significant influence on innovation speed and financial performance. However, tacit knowledge sharing is observed to have more significant effects on innovation quality and operational performance.

Furthermore, the use of Knowledge Management Systems (KMS) is considered as the influencing factor of KMS success (Jennex & Olfman, 2004, 2005, 2006; Jennex, 2008). Wang and Wang (2012) reports that there are few studies studied the relationship between knowledge sharing and firm performance directly. This study evaluates success variables (individual performance and organizational performance) as a consequence of knowledge sharing (KMS use).

2.4. Research model and hypotheses

This study proposes a knowledge sharing model based on the assumptions of Ozlen and Handzic's (2014) Knowledge Management Systems Adoption and Effectiveness model which extends Davis' (1989) Technology Acceptance Model (TAM) by adding antecedents and outcomes of adoption behaviour. They evaluate decision making related components for individuals (Individual's Self-Efficacy and Task complexity) and socio-technical KMS as the antecedents. Furthermore, they

add performance outcomes by including knowledge, individual performance and organizational performance. In this study, social environment, KMS and sharing motivation are included as the possible drivers of Knowledge Sharing. Knowledge sharing dimension is considered as the use of KMS systems for knowledge sharing purpose. Finally, individual performance and organizational performance are proposed for the ultimate outcomes of the model as success (or effectiveness) measurements (DeLone & McLean, 1992, 2003) (Figure 1).

Social (supportive organizational culture), technical (KMS) and motivation (sharing motivation) related components are collected under the name "Supportive Socio-Technical Environment". The second component is knowledge sharing behaviour and finally organizational and individual performances are considered as the outcomes of successful Knowledge Sharing (Figure 1).

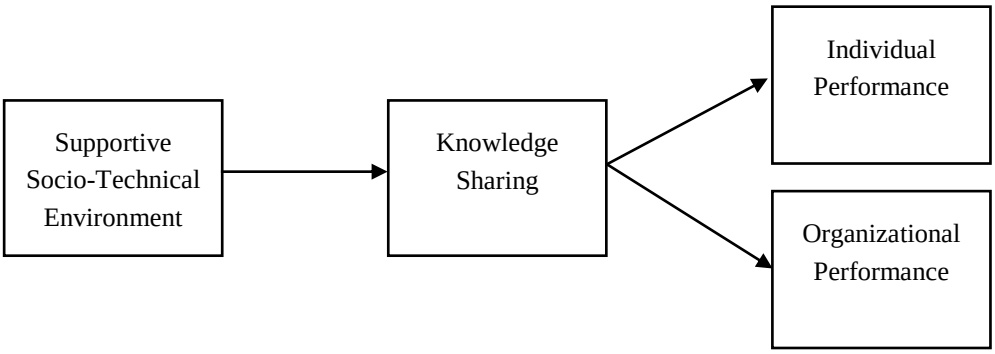

Figure 1. Research model

Therefore, the following hypotheses are proposed for the research model in Figure 2.

H1. "Supportive Socio-Technical Environment" has a positive influence on "Knowledge Sharing".
H2. "Knowledge Sharing" will positively affect "Individual Performance".
H3. "Knowledge Sharing" will have a positive impact on "Organizational Performance".

3. Methodology

3.1. Research design and instrument

A survey based method is preferred in order to empirically analyse the proposed research questions and to verify the constructed research model. The questionnaire is developed according to a seven-point Likert scale (1=strongly disagree,

2=disagree, 3=slightly disagree, 4=neutral, 5=slightly agree, 6=agree, 7=strongly agree). Furthermore, the survey is distributed both on English and Bosnian language.

3.2. Sample

The survey focused on the employers of Bosnian public and private enterprises. Mainly high rank employees such as supervisors, presidents, auditors and CEOs are targeted. On the other hand, the other level employees are also surveyed. Because of the availability of respondents, convenience sampling is preferred while selecting the sample. Totally 207 responses are achieved from distributed surveys.

One experienced difficulty is that the awareness of KM in general. Hence, KM and the goal of this research are briefly explained to the respondents in order to increase the number of qualified data. Another challenge is that lack of trust towards this kind of surveys which requires giving certain internal information about company.

The sample size is found to be sufficient to test the assumed relationships by structural equation modelling. MacCallum *et al.* (1999) and Kline (2011) suggest that an increasing sample size is better for the possible problems with factor analysis and the validity of the statistical results. The achieved sample size (207 responses with 26 items) can be accepted as almost satisfactory according to the literature (Nunnally, 1978; Velicer & Fava, 1998; Garson, 2012).

Descriptive statistics, factor analysis, correlation analysis and reliability test are performed in SPSS 18 and the structural model is analysed by the help of structural equation modelling (SEM) software AMOS 18.

4. Results

4.1. Demographic information

The respondents are mainly from operational (35,3%), administrative (26,6%) and educational (17,4%) departments. Their positions are as follows: clerical workers (42%), managers (28,5%), university lecturers (21,7%), etc. Male and female respondents are nearly equally participated (52,7% vs. 47,3% respectively).

Table 1. Respondents' departments

Respondents According to Their Departments	Frequency	Percent
Operations	73	35.3
Administration	55	26.6
Education	36	17.4
Finance	11	5.3
Law	10	4.8
Marketing and Sales	9	4.3
Auditing	7	3.4
Research and Development	5	2.4
Human Resources	1	0.5
Total	**207**	**100**

4.2. KM Implementation Level

The respondents also evaluated their organizations KM implementation levels. Few respondents (30/207) rated their organizations as having no KM strategy. According to 82 responses, their organizations have at least a KM strategy (82/207). 62 respondents stated that their organizations have an implemented KM strategy. Moreover, 50 respondents rated their organizations as successful in knowledge sharing. 27 respondents assume that KM practices are a part of their organizational culture. 35 considered their organizational internal environment is approvable for emerging of KM. 25 respondents suppose their organizational external environment as approvable for emerging of KM.

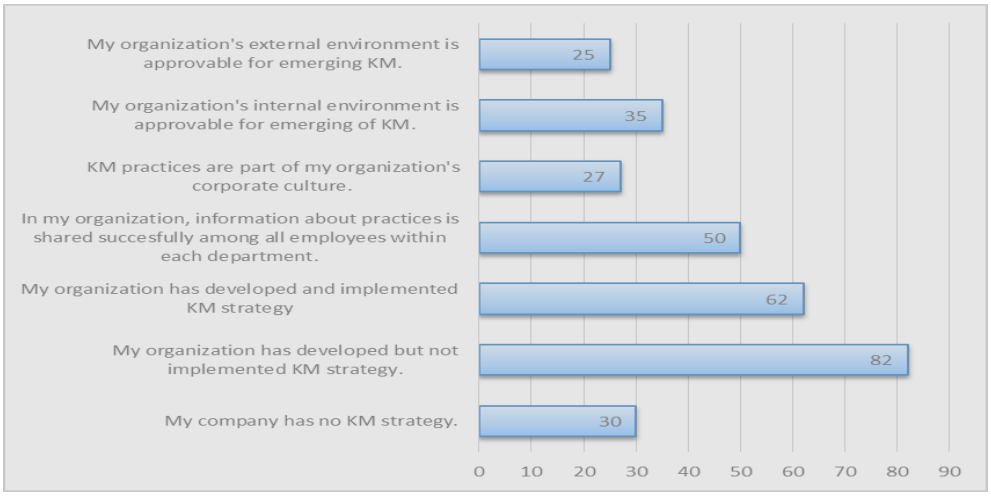

Figure 3. KM Implementation Level

4.3. Research model test

Factor analysis is employed by Principal Component Analysis (PCA) using Varimax rotation in SPSS. Pearson Correlation test is applied to test the correlations among the constructs. In the next step, path analysis is applied to test the structural model in AMOS. Ultimately, the overall model fit is evaluated using a variety of the suggested statistics.

4.3.1. Measurement model

The measurement model, as a result of PCA, is checked in terms of internal consistency and convergent and discriminant validities. Internal consistency is measured in terms of item loadings, Cronbach's alpha and reliability of the factors. The square root of average variance extracted (AVE) is assessed for convergent validity. The literature suggests 0.5 or above as acceptable for AVE (Fornell & Larcker 1981). In terms of discriminant validity, the square root of average variance extracted (AVE) values for each construct should be above the correlation between the construct and the other constructs. As observed from the table, the conditions are satisfied.

Table 2. Correlations among the Factors and AVE (on the main diagonal)

Correlations				
	KSE	OP	IP	KS
KSE	**0,911**			
OP	0,529	**0,940**		
IP	0,510	0,508	**0,937**	
KS	0,588	0,423	0,419	**0,928**

Correlations are all significant for $p<0.001$

4.3.2. Structural model

The proposed structural model is evaluated with the estimation of the path coefficients and the R^2 value. The results of the analysis are presented in Figure 4 and summarized in Table 3.

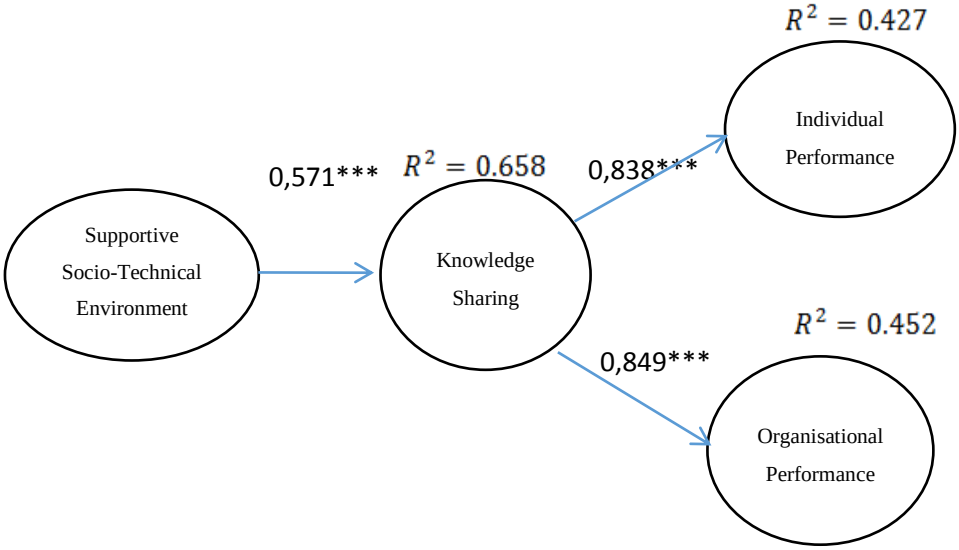

Figure 4. Structural model and path coefficients (*, p<0.001)**

4.3.2.1. Parameter estimates

Individual parameter estimates and related values are presented in Table 3. The model is observed to bring out significant results implying that all the hypotheses are supported.

Table 3. Research Model Regression Weights

Regression Weights: (Group number 1 - Default model)			**Estimate**	**S.E.**	**C.R.**	**P**	**Label**
Knowledge Sharing	<---	Environment	0,571	0,06	9,83	***	par_1
Individual Performance	<---	Knowledge Sharing	0,838	0,11	7,82	***	par_2
Organizational Performance	<---	Knowledge Sharing	0,849	0,11	7,99	***	par_3
IP	<---	Individual Performance	1				
OP	<---	Organizational Performance	1				
KS	<---	Knowledge Sharing	1				
KSE	<---	Environment	1				

Finally, the structural model is examined by considering the path coefficients and the R^2 value. According to Cohen (1988), absolute values of path coefficients less than 0.1 have weak effect; the values around 0.3 provide "medium" effect; and 0.5 or more characterize "large" effects. Therefore, the research model has high explanatory power.

4.3.2.2. Absolute fit indices

The overall fit of the structural model is studied using a variety of statistics from different aspects. As Kline (2011) suggested, since the χ^2 statistic is highly sensitive to sample size, Chi-square/df may be preferred instead. The χ^2 value for the current model is identified to be significant by CMIN= 6.153, df=2, p= 0.046. Therefore, by considering the suggestion of Garson (2012), the results are evaluated in terms of GFI, NCP, FMIN, RMSEA, etc. instead of significant chi-square test.

Garson (2012) advises 0.90 and more for the CFI (Comparative Fit Index) and IFI (Incremental Fit Index). This study got 0.983 for both indices. He also suggests at least 0.80 for TLI value. The TLI value for the research model is 0.913. Hu and Bentler (1999) recommend 0.90 and higher for Relative Fit Index (RFI) which is observed to be 0.876 for this model.

For RMSEA results, Byrne (2001) suggests 0.05 or less for good fit, and values between 0.005 and 0.08 for reasonable fit. MacCallum *et al.* (1996) noted that RMSEA values between 0.08 and 0.10 indicate an average fit, and greater than 0.10 specifies a poor fit. The RMSEA value for the proposed model is 0.10 (an average fit).

The proposed structural model sufficiently provides a good fit to the data for the indicators.

Table 4. Fit indices for the tested research model

Fit Index	Guidelines	Test Result
Chi-square (CMIN) significance (p)	>0.05	0,046
Chi-square/Degree of Freedom (CMIN/DF)	<2-5	3,076
Comparative Fit Index (CFI)	>0.90	0,983
Incremental Fit Index (IFI)	>0.90	0,948
Root mean square error of approximation (RMSEA)	<0.10	0,10
The Tucker-Lewis coefficient (TLI) or NNFI	>0.80	0,913
IFI (Incremental Fit Index)	>0.90	0,983
RFI (Relative Fit Index)	>0.90	0,876

5. Conclusion

This study empirically tests a knowledge sharing model. Despite the hypothesized model is empirically supported, the results provide that KM in BiH environment is in its early phases implying that more attention is required to develop KM implementation strategies. The literature is weak in that it could not provide a knowledge sharing study in Bosnian marketplace. The study provides valuable theoretical and practical insights, since the collected data represents the leading companies in BiH-as an emerging economy. According to the results, few respondents assume that knowledge is successfully shared in their organizations. However, despite the problems within last two decades, it is observed that KM is gradually taking place among Bosnian companies and they somehow try to implement KM initiations. Hence, this study may be useful for the surveyed companies to see their weaknesses compared to the global market and take necessary actions.

This study empirically supports the assumed hypotheses that knowledge sharing practices improves organizational and individual performance through the development of successful knowledge sharing which is supported by a socio-technical knowledge sharing environment. The identified relationships among knowledge sharing, knowledge sharing environment and performance can give a guideline for the companies in order to get better performance through knowledge sharing.

According to the results, in line with the expectations (Alavi *et al.*, 2006; Ribiere & Sitar, 2003; Tsui, 2003; Handzic, 2011; O'Dell & Hubert, 2011), a supportive socio-technical knowledge enabling environment within and outside the organizations should be initially developed and technology instruments to facilitate KM processes should be used more. On the other hand, organizational knowledge sharing behaviour can also be enhanced by increasing the motivation to share knowledge. Otherwise it may be difficult to adopt KM solutions. As a result of successful knowledge sharing, better performance for individuals and organizations can be achieved. The results may be useful for Bosnia and Herzegovina and neighbourhood countries which have similar characteristics in developing successful KM and KS behaviour.

Further studies can expand the model employed in this study by considering different antecedent and consequent constructs to identify different aspects of knowledge sharing behaviour.

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