The relation between Groupware technology and knowledge management processes

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Abstract—

Purpose: **Aims to explore the relationship between Groupware use and the knowledge management process. Design/methodology/approach**

The activities comprising the knowledge management process are conceptualized as: knowledge capture, knowledge storage, knowledge dissemination and knowledge reuse.

The data for this qualitative study were gathered through 272 front office agents, working in the Tunisian mixed-capital banks, and it was analyzed by the Structural equation modeling (SME).

Based on the prior literature, it was expected that the use of Groupware tools and the four stages of the knowledge management process would be significantly associated

Findings:

The results of this study show that the use of the Groupware tools was significantly associated with three stages of the knowledge management process we identified. However, knowledge transfer isn't significantly associated with the Groupware use.

*Originality/value***: This research highlights some policies to enhance the use of Groupware system in knowledge management process .**

The current study is considered the first of its kind conducted in the Tunisian context. To the best of our knowledge, no such studies have been conducted regarding the relationship between groupware and knowledge management process within banks.

Keywords: Groupware, Knowledge management process, Tunisian mixed capital banks, sharing culture.

I. INTRODUCTION:

Modern banks pay more attention to the area of management .They understand that employees` knowledge constitutes one of its key resources.

According to the resource based view theory, knowledge is considered as a strategic resource which can take part in the firm `s competitiveness. [1].

Today, most of the organizations, either commercial or government agencies focus on knowledge management by implementing a Groupware technology to expedite research and develop knowledge, reduce travel expenses, and make the decision making time shorter and therefore competitiveness becomes better.

In this paper, we empirically explore the relationship between groupware use and the knowledge management process.

Thus, the objective of this paper is to develop a better understanding of the role of Groupware in enhancing knowledge management processes.

This study proposes a theoretical model on the basic contention of which is that the relation between Groupware technology and knowledge management process is direct: Groupware technology can directly influence the knowledge management processes.

The following sections discuss the concepts of knowledge management and groupware technology. Then, these hypotheses representing the relations between Groupware use and knowledge management processes are formulated.

The hypotheses are tested with the structural modeling technique, using data collected from 272 bank agents. This work concludes with a discussion of the results and their implications.

II -LITERATURE REVIEW :

A. Knowledge Management Process

Knowledge management is largely regarded as a process involving various activities. Following a literature study of KM practices,[2] synthesizes generic knowledge management activities as follows :collect, store, transfer and use.

B. Groupware framework in knowledge management

Development in collaborative (Groupware) is increasingly focusing on technology for geographically distributed teams. This means that instead of bringing groups together

in a meeting room equipped with computers, we can assign some kinds of online tasks in virtual workspaces. This type of electronic collaboration has become a powerful means of capturing, exchanging, exploiting, and managing knowledge. In this way, electronic collaboration becomes an instrument in capitalizing organization's intellectual capital.

We now describe the relationship between the Groupware use and knowledge management process. For this purpose, it is useful review first the nature and definition of groupware.

Groupware tools are technology-based tools that support geographically dispersed groups of people sharing knowledge through the use of computing resources [3] These tools enhance employee in collaboration on projects where participants allow members to work directly and sometimes anonymously [4].

Groupware includes the ability of sending and receiving e-mail, sharing personal calendars, holding computer conferencing, and working flow management [5]. The products that fit this technology tools are Lotus Notes, e-mails, intranet, internet, electronic conferencing tools and many others [5] and [6].

Coleman (1997) [7] argues that groupware offers advantageous as it facilitates communication, brings together multiple perspectives and expertise, saves time and cost in coordinating group work, facilitates group problem-solving, and enables new modes of communication, such as anonymous interchanges or structured interactions.

B.1Groupware and knowledge capture:

Groupware is a process of identifying, capturing and mobilizing collective knowledge in an organization, in order to improve its competitiveness [8] .

Groupware tools, such as Lotus Notes or internet, help capture new knowledge and maintain organizational memory in reinforcing traditional routines, working procedures and practices. Moreover, these tools can also capture informal communication, personal experiences, and interpretations.

Consistent to all models drawing from psychological theories, individual behavior is
predictable and influenced by individual intention.
Furthermore, Venkatesh et al.(2003); Venkatesh & Zhang (2010) proved that behavioral intention have a significant influence on technology usage.
Accordingly, this study hypothesizes:
H1: Intention of use has a positive effect on the expected behavior of using Groupware.
H2: Intention of use has a positive effect on the use of Groupware.
H 3: The individual behavior has a positive effect on the use of Groupware
H4: Groupware facilitates the capture of knowledge.
B.2 Groupware and knowledge storage:
Groupware can help increase organizational memory because of its accuracy in storing organizational knowledge. It can provide common support to review similar cases and solutions, and analyze their contexts for problems and solutions.
H5: **Groupware provides the capitalization of knowledge**.
B.3 Groupware and Knowledge distribution

CSCW has focused on the social practice involved in knowledge sharing, as well as on the systems that could support knowledge sharing [9] through the internet between the firm, employees and customers, which is important to promote the process of knowledge management [10].

Integrated Groupware, which is framed around an IS infrastructure, can bring together employees of diverse skills from around the globe to share knowledge while working on a project. Internet, intranet, and other groupware technologies, such as Lotus-Notes and e-mail, can be used to distribute and share individual experience and innovation throughout organizations.

As Bates and Allen (1994) [11] argue in their study of MCI, by using Lotus Notes as the central computing platform, MCI has institutionalized the practice of sharing its best practice within the organization.

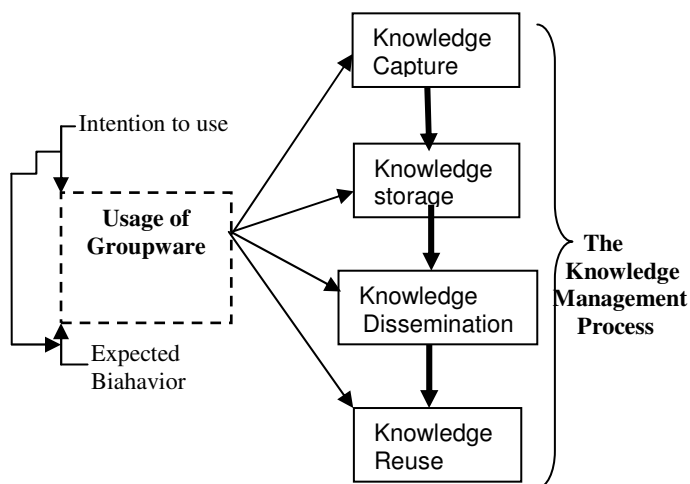**H6: Groupware participation in the dissemination of knowledge**

B.4 Groupware and Knowledge reuse:

Hansen et al. (1999) [12] argue that the reuse of knowledge is an important criterion for companies of which major tasks require similar knowledge. Software development and banks are an example. These companies are not required to
substantially modify past knowledge. Reusing knowledge saves time and efforts. For routine problems and tasks, the reuse of existing knowledge can often provide quick and easy solution.

H7:Groupware is a potential tool for the knowledge reuse

Conceptual framework:
Figure 1: The Proposed Research Structure

III. METHODOLOGY

A. *Research Method Approach*

This is a descriptive research that investigates the role of the Groupware use by front office agents and knowledge management process in Tunisian mixed capital banks. A cross-sectional survey research had been chosen as an

approach where primary data were collected by requesting the respondents to fill up a questionnaire.

B. *Measurement*

The questionnaire has a set of questions that state the respondents' opinions about of the use of Groupware develops the knowledge management process It is measured on the Likert scale ranging from1 to 5 . We used multi-item measures to represent all the variables using a 5-point scale (H. Tanriverdi ,2005 et A. Vaccaro, et al.,2009) 1=Strongly Disagree, 2=Disagree Somewhat, 3=Neither Agree nor Disagree, 4=Agree Somewhat, 5=Strongly Agree

C. *Sampling Procedure*

The population in this research consists of the users of Groupware in Tunisian mixed capital banks.

Due to the difficulty of obtaining a survey frame of all the front office staff working in Tunisian mixed capital banks, such as the Central Tunisian Bank (BCT), we selected a sample by convenience method. With the help of some managers working in the (BCT) and their contacts made for the general managers of the Tunisian mixed capital banks, only four banks from different parts of the country agreed to collaborate.

D. *Data Collection*

Three hundred and eight copies of the questionnaire were distributed to eighty Tunisian banks agencies with mixed capital. A total of 308 answers were collected from the front office agents 272, of which were and completed and analyzed.

E. *Data Analysis*

The software used in analyzing the data was AMOSS16.The statistical analysis includes the Principal Component Analysis (PCA) and the structural equation model (SEM).

Structural Equation Modeling (SEM) is a statistical methodology that takes a confirmatory (hypothesis testing) approach to the structural analysis of data representing some phenomena (Kline, 2005). [13]

The two-step SEM approaches of recommended by [14] will be adopted in this study. First, the measurement model will be measured to examine the validity and reliability of the data .Next, the structural model will be measured to test the hypotheses of the study and the fitness of the data to the model.

VI. RESULTS AND DISCUSSION

Exploratory factor analyze
Table1: Factor Loadings and Alpha de Cronbach

Constructs	Items	Loadings	**Alpha de** Cronbach
Behavioral Intention	BI1	0,517	

Expected Behavior	EB1 EB2	0,667 0,628	0,711
Capture	CAP1 CAP2 CAP3 CAP4	0,879 0,874 0,898 0,885	0.904
Storage	ST1 ST 2 ST 3	0,846 0,870 0,823	0.800
Reason of storage	RS1 RS2 RS3	0,771 0.851 0,831	0.742
Destribution	DE1 DE2 DE3	0,840 0,862 0,806	0.785
Reuse	RE1 RE2 RE3 RE4 RE5	0,822 0,811 0,732 0,785 0,645	0.890

The exploratory analysis was conducted using SPSS 18 of which the items with low factor contributions were deleted. Table 2 shows that AFCP retains a single factor for all the variables with positive factor contributions and above 0.5, thus confirming the dimensionality of this construct. The reliability analysis shows that alpha values are greater than 0.6 for all the variables. Concerning the quality of representation of items, it is also satisfactory (> 0.5)

Confirmatory factor analysis
Table2: The adjustment indices of the structural model

Fit indices	**Determined values**	**Values Assessment**
X2/dl	1.512	≤ 2
GFI	0.922	(>0.9)
AGFI	0.945	(<0.9)
CFI	0.907	(>0.9)
TLI	0.933	(<0.9)
NFI	0.976	(>0.9)

RMR	0.023	(<0.05)
RMSEA	0.057	(<0.08)

Table 2 shows that, all of these measures indicate a fairly reasonable model fit.

The SME results:

This study employs the partial least squires (SME) regression to examine the presented research structure. Table 3 shows that the capture of knowledge by the front office staff is significantly impacted by the use of Groupware. The storage of staff knowledge is significantly impacted by the use of Groupware.

However, the front office staffs usage of Groupware has no effect on the transfer of knowledge .This result differs from the one of [15] where groupware is found as an application to establish a relationship between the employees to help them exchange, share and deepen their expertise.

Hypothesis	Coefficient of regression standardized	CR	P
H1 Intention of use has a positive effect on the expected behavior of using Groupware.	0,245	1,004	0,176
H2 Intention of use has a positive effect on the use of Groupware	0,765	3,590	0,000
H3 The individual behavior has a positive effect on the use of Groupware	0,459	2,990	0,001
H4. The use of Groupware facilitates the knowledge capture.	0,585	2.064	0.001
H5. The use of Groupware provides the knowledge storage.	0.433	2.440	0.001
H6. The uses of Groupware participate in the knowledge transfer.	0.191	1.082	0.093
H7. The use of Groupware is a potential tool for the knowledge reuse.	0.510	2.126	0.001

The empirical evidence of this study indicates that the knowledge storage is the most influenced phase of knowledge management process by using the Groupware system. This seems to be consistent with the finding of [16] and [17].

Besides, we found that the Groupware system has a significant effect on the knowledge capture, the thing which seems to be consistent with the finding of ([18],[19] and [20]).

This result showed that the front office agents seek to follow the news issued by the management of the bank in order to be updated.

Regarding the dissemination knowledge, the empirical evidence in this study isn`t consistent with that of [21], [22] and [23] who showed the significant effect between Groupware use and knowledge sharing.

This empirical study concluded that using groupware tools did not play a determinant role in influencing bank's agents to share their knowledge. This result may be due to the fact that the front office staff considers groupware as a control system by the stockholders. The mistrust can be a significant barrier for the exchange of information.

This can be also explained by the fact that the front office agents think that the use of traditional tools of transfer (face to face, telephone) is easier and faster than the numerical tools.

Moreover, this study found that the knowledge reuse is significantly influenced by the use of the Groupware system, the thing which seems to be consistent with the finding of [24] and [25].

Theoretical contributions

This study does not provide a major innovation in theory but can be considered original in two respects. On the one hand, it is used to enrich the RBW theory and shows that technologies are only part of the knowledge management equation. The only implementation of collaborative technology can not promote the knowledge management process.

On the other hand, it is the first study conducted in the context of the Tunisian mixed capital banks on using the Groupware system.

Managerial Implications

Regarding the phenomenon of the Groupware use, its utilization, as a knowledge management system in banks, is still marginal. This study shows that the acquisition, the capitalization and the reuse of knowledge are three steps of knowledge management cycle for which the front office staff use the Groupware tools.

In addition, we found that the respondents did not have recourse to the use of Groupware tools in the sharing of professional knowledge. They believe that Groupware tools are designed to control digital information by their stakeholders. Consequently, their lack of confidence and feeling mistrustful can be an important obstacle for breaking their exchange of information [26].

In a banking environment characterized by a wide database, banks must provide their customer with rapid and reliable information. Groupware incites participants to share and distribute information to regress bank's agent activities to a common set of norms, thus facilitating the process of social relationships and knowledge management activities.

The issue of motivation remains very salient.

For example,[27].identified motivational barriers located mainly in the competitive structure within companies. In their study they found that, if knowledge sharing is not rewarded, employees have no incentive to engage in it. In this case, banks should invest in financial and nonfinancial motivators.

In order to enhance knowledge sharing Strengthening a communal orientation to improve the project group and the group work seems important, given the trend toward the greater use of work groups in successful organizations [28].

Our results may also be in compliance with the feeling of jealousy or competition between employees. This behavior is contrary to the goal of stakeholders who seek the transversality and deconcentration of ideas. In order to face this challenge, the authors recommend developing a training strategy around organizational and individual benefits of usage of this technology before developing a collaborative technology strategy. This is in line with [29] and [30], who argue that before developing a strategy, firms must develop a knowledge strategy to provide the basis for the IT strategy, but not the other way around. Organizations lacking such a strategic foundation could fail to understand the complementarily between the implementation of collaborative technology and the objectives of knowledge management and consequently miss out on successful innovations and improved performance.

Banks need to: identify that using Groupware tools is important for the bank and for the front office agent; exploit the interrelations between workgroups; promote group work and set goals for them in order to involve all the members in the achievement of their objectives referred.

Directors of Human Resources need to foster an organizational sharing culture that encourages the front office agent in knowledge management initiatives and help all the project members perform their activities to the best of their ability.

The outcome of the research incites to better explore the use of Groupware system in the knowledge management process; specially in sharing knowledge and best practice, to enhance the staff competence and their professionalism.

Limitation and Future Research

There are few limitations in this study. Firstly, the number of banks studied is limited. This survey did not interview all the Tunisian banks with mixed capital and hence, a larger number of the Front office agents were not included.

Secondly, this study did not take into consideration the various groupware tools implemented in banks and their effect; it only tested the influence of the overall Groupware system.

Future researches should examine different tools of groupware, such as mail, videoconference, forum…

It would also be important to conduct à longitudinal study to better understand the real reasons which prevent bank's agents from sharing information and knowledge via Groupware tools, and checking their validity over time.

V.Conclusion:

The aim of this research is to explore the relationships between the groupware use and the knowledge management process in the Tunisian mixed-capital banks. throughout the distribution of 272 copies of a data analysis questionnaires were used for data analysis.

The results of this exploratory study show that the groupware system was significantly associated with most of the stage of the knowledge management processes we identified. However, knowledge transfer isn't significantly associated with the Groupware use.

These results can help the human resource managers develop more efficient policies and strategies for inciting the front office agents to collaborate and share their knowledge via the groupware tools in order to enjoy its benefits.

Stakeholders should pay more attention to the key factors of successful knowledge management system. Lack of motivation and enhancing an organizational sharing culture can be the major reasons about why some banks agents don't share their knowledge through Groupware system.

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