

The Barriers of Sharing the Supply Chain Knowledge and Methods of Treatment: Case Study in a Sample of the Faculties of the University of Mosul

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Abstract- This study aimed to examine the barriers surrounding sharing the supply chain knowledge and the successful ways to minimize the barriers of sharing the supply chain knowledge. The study also set to investigate different ways to reduce the negative impacts of knowledge sharing in the faculties of the University of Mosul. The study adopted questionnaires designed from a group of article journals and the respondents were selected from the faculties in the University of Mosul. A set of conclusions were developed after identifying the challenges of sharing the supply chain knowledge using statistical methods to analyse the data from the faculties of Mosul University. From the conclusion, the study recommended the need to give employees more confidence and the advantage of motivation in reducing barriers to knowledge sharing in the university.

Keywords: *supply chain knowledge, knowledge sharing barriers, solution, Barriers.*

1. Introduction

The focus of researchers, employees and managers has equally become the quest for knowledge. Many organizations have recognized knowledge as an important phenomenon. The values of knowledge determine the value of production and products. Primarily, knowledge sharing is aimed at sharing knowledge within and across the organization; the sharing of knowledge can either be in one way or two-way and it is more than just a connection between two parties. Many literatures indicate that there are many barriers of sharing the supply chain knowledge within organizations. The desired results are not sometimes achieved with the sharing of knowledge in organizations thereby leading to failure in achieving knowledge-sharing processes successfully as the organizations try to modify or share knowledge and strategies rather than focusing on the application of knowledge sharing. Ordinarily, the organization should focus on the accuracy

of sharing knowledge with the culture of the organization in order to avoid the important barriers of sharing the supply chain knowledge. Knowledge sharing is a process that starts with an individual and ends through sharing from one person to another. It is important to have people willing to share knowledge in an organization who are motivated by the organization to execute the process of the sharing. Knowledge sharing is a key factor in an organization which an organization cannot attain its goals without its existence. Among the employees in an organization, there are many factors that have clear impacts on the rate of knowledge sharing. In the same view, new strategies are needed to be developed by the administration that can promote knowledge sharing in an organization. Therefore, it is important to identify the barriers of sharing the supply chain knowledge in an organization as this is the initial step towards identifying appropriate methods to address the challenges of knowledge sharing. This study thus aimed to answer the following research questions:

- Are there barriers of sharing the supply chain knowledge in the organization?
- Does the impact of knowledge integration barriers in the organization on sharing the supply chain knowledge differ from the selected population?
- Do the different methods of addressing the barriers of sharing the supply chain knowledge affect knowledge sharing?

The objectives of this study are as follow:

- To present a theoretical and practical study for the university administration in the area of sharing the supply chain knowledge and methods of treating such barriers.
- To identify various sources of knowledge sharing in the university and recognize the most important and peculiar ones to the universities.
- To identify the most appropriate methods to address the obstacles of knowledge sharing in the university.

2. Literature Review

2.1 The Concept of Knowledge Sharing

The interest in knowledge sharing is becoming increasingly common among organizations and researchers. Knowledge Sharing represents an attempt and contributions towards the creation of a knowledge-base in an organization. This implies that knowledge sharing within an organization is central to knowledge management. The most important concern is sharing knowledge at the organizational level as knowledge is considered as a creative process, innovation and intangible asset that is hard to reproduce. According to [11], knowledge sharing is defined as the process by which information and skills are shared. Skill sharing refers to the skills that can be measured by the level or rate of knowledge sharing (frequency and time spent sharing) through knowledge sharing (the formula and the form of knowledge sharing). Similarly, knowledge sharing involves training employees through reasoning and applying insights to accomplish the assigned tasks. Additionally, knowledge sharing is a process of transmitting skills, information and experience to the recipient who has the potential to learn, absorb and integrate new ideas from the best practice of the source with the available old information and then improve the current knowledge in order to enhance the efficiency of the current performance of the organization. Furthermore, knowledge sharing is considered as the way at which knowledge is shared. Also, it is the process of capturing knowledge and exporting or importing knowledge from one place to another. In view of this, knowledge sharing is the exchange of knowledge between at least two parties in a reversible process which allows recognition and reformulation of new content in the knowledge industry. Similarly, [7] concluded that knowledge sharing is the process of facilitating learning by exchanging processes, products and useful ideas while [9] in other word said it is the process in which knowledge is exchanged between individuals. In accordance to the above assertions, [10] summarized the main characteristics of the concept of knowledge sharing as follows:

- Knowledge sharing is the behavior of an individual with leadership feature
- Knowledge sharing is proportional to proactive action
- Knowledge sharing is engaged by systems or environmental measures such as code of conducts, habits, legal and ethics.
- Sharing of knowledge between two or more people is the benefit from Knowledge sharing

The study therefore opined that concept of knowledge sharing refers to the process of capturing knowledge and transferring it from one unit referred to as the source unit

to another unit known as the receiving unit based on the above highlights. Thus, there are two aspects to the equation of knowledge sharing: there must be an exchange of knowledge between these two aspects for the purpose of sharing knowledge in a reciprocal way with new content that enables the restructuring of knowledge.

2.2 Barriers of Sharing the Supply Chain Knowledge

It is suggested in various recent researches in the area of knowledge sharing that there are many challenges to knowledge sharing. According to [5], priorities of knowledge contribution may be divided into two parts: costs and benefits. The study found that knowledge is a cost preventing access to knowledge sharing through taxonomic efforts. Similarly, knowledge sharing is a process of differentiating the existing knowledge to be transferred and applied to solve the common problems in an organization and the process of creating new knowledge by incorporating the current knowledge. Thus, there are five critical factors that affect the process of knowledge sharing in an organization on this basis:

- Knowledge Stickiness: In comparison with the apparent knowledge, the implicit knowledge may be considered stickier and therefore requires more effort to share knowledge in the field of implicit knowledge.
- Identity Loss: As workers in the same group use the same technical language and the data to achieve the same goal, the common identity facilitates knowledge sharing.
- Weak relationship between the sender of knowledge and its recipient: In order to be able to share knowledge, there is need for the necessity of power in the relationship between the sender of knowledge and its recipient. Furthermore, it is compulsory for the sender and the recipient to trust one another on the knowledge security obtained by the receiver.
- Weak desire to share knowledge: there must be desire to share knowledge between the sender and receiver.
- When the employees do not have knowledge on knowledge sharing, sharing of knowledge becomes impossible.

In another vein, [12] mentioned that in the study of sharing and transfer of knowledge in knowledge management at the Fraunhofer Institute, many questions were raised on the knowledge management barriers of the organization where the commonest of them are as follows:

- Lack of knowledge management
- Loss of knowledge
- Lack of time
- Loss of institutionalized incentive

- Lack of powerful knowledge
- Lack of transparency
- Inappropriate Information technology structure
- Lack of sharing
- Inappropriate organizational culture
- Lack of specialization

In contrary, [2] stated that there are two fundamental barriers of sharing the supply chain knowledge which fall under two main constraints:

Lack of Invention

- According to quality in a single way and the link, no one can become the resident;
- There is need for adaptation of external knowledge for internal use which requires effort and time that can be used to develop knowledge internally.
- The worker may have the feeling that the use of external knowledge can reduce the connection to the results and increase the risk of separation.
- Through the mountains of existing information, the fastest workers reinvent the wheel better than the traction.

Knowledge is Power

- Knowledge is seen as part of personal competitive advantage by individuals
- General information under the cover of being an assistant is shown by the employees as they are busy to assist.
- Asking questions during an interview more than it should be implemented.

Furthermore, on the relationship between workers and their contribution to the failure of knowledge sharing, [1] categorized four groups of factors that the occupier proposed to have effect on the difficulty of transferring and sharing knowledge:

- The characteristics of the shared and transmitted knowledge
- The characteristics of the source of the knowledge
- The characteristics of the receivers of the knowledge or information
- The context in which the knowledge is shared or transferred

The barriers of sharing the supply chain knowledge according to [2] are as follows:

- Confidence
- Techniques
- Shortages of stimulation
- Lack of resources
- Organizational structure

- Lack of commitment by senior management

Furthermore, [3] stated that the knowledge that is shared between various units of an organization is not reliably delivered. Clearly, hiding of knowledge is the phenomenon that largely controls organizational reality. There are three types of constraints related to knowledge sharing as mentioned by [4]:

- Advanced knowledge at the local level
- Asymmetrically distribution of knowledge
- Voluntary knowledge sharing

In other word, the barriers of sharing the supply chain knowledge consist of three main groups:

- Barriers of sharing the supply chain knowledge at the individual level;
- Barriers of sharing the supply chain knowledge at the technological level;
- Barriers of sharing the supply chain knowledge at the organizational level.

2.2.1. Barriers of sharing the supply chain knowledge at the Individual Level

Successful knowledge sharing is clearly dependent on a number of factors as far as knowledge sharing is concerned with workers' motivation to share knowledge while the most important of them are the individual factors. These factors such as capacity and motivation must be given high attention as they are crucial factors at the individual stage of barriers of sharing the supply chain knowledge. This concern is due to the fact that they significantly contribute to facilitating and improving knowledge sharing within an organization. According to multiple goals and causes that can give rise to the level of performance, there is a difference between the two types of incentives:

- Extrinsic motivation; and
- Intrinsic motivation

[13] examined the occasional response to the external motivations of activity in order to find whether there is stimulation to accomplish a task or not. The accidental stimulation comes from the outside of a working individual and rewards in forms of: career promotions, punishment in the event of impartiality, display desired behaviour, and financial rewards. The intrinsic motivation refers to the motivation to complete a task by giving attention or from the pleasure of the work within the individual (an inner motivation) rather than the desire to reward others or external pressure.

2.2.2. Barriers of sharing the supply chain knowledge at the Technological Level

The most damaging issue to knowledge sharing in acquired development at the technological level may be due to hesitant inappropriate, conflicting and techniques in the implementation of the selected technique. A

company is likely to be acquired in relation to the issue of acquisition from the selected techniques in terms of acquisition and different techniques are used by the company acquired. Sharing knowledge will be a very complex process if the technology is conflicting (different). According to [2], the use of unfamiliar techniques may be opposed by employees in an organization and a reluctance to use technology can be caused by highly developed testing of software work by professionals. As the expression "hybrid solutions" refers to interactions between employees and technology to facilitate sharing practices, sharing knowledge as an organizational issue is also a technical challenge. For more effective knowledge sharing, there is need for correct combination of technology and high awareness whether cultural and behavioural awareness. Creating an environment where employees want to share what they know and use what others know is challenging to most companies. Technology has the ability to directly access large amounts of data and information to enable easy interaction.

2.2.3. Barriers of sharing the supply chain knowledge at the Organization Level

The culture of a company or organization refers to the beliefs, the values and the systems that would motivate or

setback the sharing of knowledge within an organization. Every organization possesses a unique culture that reflects its identity over two main dimensions:

1. Visual Culture: The functions, and philosophy of the organization which evolve over time and the values that are embraced by the members of the organization.

2. The Hidden Culture: The hidden parts are connected with the values and standards of the employees who guide their action and behaviours. In order to share knowledge, organizations must support and encourage their employees.

In addition, [3] observed that workers share knowledge in the environment of their peers and colleagues in some organizations in order to make sharing selective. The knowledge that has been evaluated will not be acquired by a worker that does not have closeness and strong relationships with peers. [14] added that, as the mechanical organizational structure hinders knowledge sharing, organizational size and structure can be barriers of sharing the supply chain knowledge. To effectively share knowledge, organizations need to support and encourage their employees. Table 1 by [15] presents the barriers to sharing knowledge at different levels (individual, technological, and organizational) with the inclusion of several factors, which the study found relevant.

Table 1: Classification of barriers of sharing the supply chain knowledge

Items	The Barrier	Factors Leading to the Main Constraint
1	Barrier at the individual level	<ul style="list-style-type: none"> i. Lack of time to identify colleagues who need to know certain skills and time to share knowledge ii. The fear of putting the security of workers into risk during the sharing process iii. Clear dominance on the implicit knowledge during sharing of knowledge which requires observation, dialogue, personal learning and personal learning such as experience. iv. Take cognizance of the devaluation and usefulness of knowledge acquired for others. v. Using strong position and gradient according to location and official forces vi. The possibility of past mistakes, feedback, communication and Transcendental evaluation. vii. Differences in the levels of experience. viii. Lack of interaction and communication between the source of knowledge and the receivers. ix. Poor personal skills, written and oral communication. x. Gender disparities xi. Differences in ages xii. Weakness in the social networks xiii. Differences in the levels of education xiv. Controlling the mentality of the employees leads to fear of accepting knowledge and affects the recognition and authorization of managers and colleagues xv. Lack of trust among the employees, due to misuse of knowledge or

		<ul style="list-style-type: none"> xvi. unfair implementation xvi. Lack of confidence in the credibility and accuracy of the source of the learned knowledge. xvii. Distinctive national ethnic and cultural background, beliefs and values connected with the language mode in which the knowledge is transferred.
2	Barrier at the technological level	<ul style="list-style-type: none"> i. Lack of IT systems and processes integration affecting the work output of the employees. ii. Low quick response to maintenance of IT systems and technical support (internal and external) that affect the communication flows and business routines iii. Wrongful expectation from the employees such as those that are connected with techniques that is difficult to follow. iv. Lack of patrolling and experience among employees due to poor compatibility between IT systems v. Strong suitability between integrated IT systems, employee requirements and needs and processes that hinder sharing of practices. vi. Lack of skills and experience among employees due to reluctance to use IT systems. vii. Lack of training for the employees on the new IT systems and processes viii. Low display and communication of all the advantages of any new systems.
3	Barrier at the organization level	<ul style="list-style-type: none"> i. Missing of incorporation of the objectives of the organization, the sharing of initiatives in the goals, the strategic outlook and knowledge management strategy. ii. Lack of administrative and leadership direction in terms of clarity of values, knowledge sharing practices, communication and benefit. iii. Insufficiency in the informal and formal avenue to share critical thinking with knowledge and generate new knowledge. iv. Lack of reward and recognition system that will motivate employees to expand knowledge sharing among employees. v. The current culture of FAO does not sufficiently support practices of knowledge sharing. vi. There is no high priority importance attached to keeping knowledge of experienced and high skills workers. vii. Deficiency in allocations of infrastructure supporting sharing practices viii. Lack of company resources that give appropriate opportunity to knowledge sharing. ix. External competition between branches and within career scope or business units can be high. x. The flow of communication and knowledge is limited in a particular direction. xi. The effectiveness of sharing practices is limited to normal working environment and the design of workspaces. xii. Internal practice within functional scope, business units and branches. xiii. Slowing down of most shared practices due to hierarchy. xiv. The units of the business are often not small enough to have difficult management to promote communication and facilitate the process of sharing.

Sources: Prepared by the researcher using the study of [6] on knowledge sharing barriers among managers

2.3. Factors Affecting Knowledge Sharing

Organizations should encourage their employees to share their knowledge in order to ensure the success of the knowledge management system. Past studies showed

that based on personal competence brought and shared within an organization, workers are generally reluctant to share knowledge. While the knowledge shared is still available, workers are liable to the risk of substitution

within the other staff. As if the employees are not clearly aware of the goals of knowledge sharing and the intention of their departments, employees are reluctant to share knowledge with other co-workers. Some past literatures on knowledge sharing in an organization reveals that the context carries a wide range of constraints. The importance of the members of the organization, their systems and the processes which are critical and crucial factors in knowledge sharing were revealed by [7], [16]. Notably, the importance of technology and the infrastructure of an organization create basic rules for the employees to communicate with each other and the common language that is generated by personal similarity.

2.4. The Different Ways to Address Barriers of Sharing the Supply Chain knowledge

Significantly, sharing activities differ between different organizations. Due to this, the factors influencing the sharing of knowledge is very important to be understood in order to know the barriers and reduce the impact of those barriers on knowledge sharing in an organization? It is important to recognize the barriers and then identify the ways to address them, for the purpose of addressing the barriers of sharing the supply chain knowledge. This study highlighted a number methods of treatment based on the similar barrier.

Awareness

In this context, awareness means the widespread communication of knowledge management activities and approaches across the organization. Employees will not understand the tools and approaches available to them, if the message is delivered poorly or in the wrong way. This will in turn cause slow sharing knowledge because employees do not have sufficient awareness. The language of sharing itself is the important aspect of consciousness as the language of sharing is very important and this is clearly manifested at some levels of shared experience. There is difficulty in the ability to reconstruct the original meaning of the originator of knowledge due to different interpretations and different meanings at the same event or information which will lead to reduction in knowledge sharing and sensitivity of the factor [17].

Culture

The word “culture” has several alternative definitions which refer to sharing of common attitudes, habits, values and knowledge by the members of one society. Therefore, culture is defined as sharing basic assumptions learned by a group to solve problems through external adaptations and internal integration. Culture includes behavior, labour standards, unwritten

rules, processes that make up real content, spoken rules about how things work in a large organization. It also includes dependence on a functional business unit or geographic boundaries. Organizations should allow a range of subcultures within a single organization that has not been associated with one another with the same values, business rules, and principles and should consider sharing knowledge as a critical issue of great value [18].

Stimulus

Workers need to be motivated by organization to promote knowledge-sharing culture within an organization. Without strong motivation, individual tends to have little interest in sharing knowledge to flow across the organization. In some cases, the knowledge is shared in a personal way while the working individual already owns the ownership. In knowledge sharing, motivation plays an important role. Motivation helps employees to achieve their objectives and goals. Motivation comes from range of different factors as employees cannot be motivated by a single factor. For the company to get more profits and benefits, equivalent work enables employees to do the things they really like and enjoy. Managers amplify emotions that make employees feel comfortable when they do their jobs as emotions play an important role in incentives.

Confidence

According to [8], trust plays a major role in sharing of knowledge. Information helps us understand why some of the obstacles in the organization are solutions to the existing obstacles. The cornerstone of knowledge management is confidence. The relationship between two or more participants will be in vain without trust. For a successful knowledge, trust is an important factor. The individual who shares knowledge must trust not only the person who shares knowledge with him, but also the higher management and the organization. The worker with the highest form of confidence is the one with the most ability to share knowledge. Additionally, fall in confidence is a strong barrier to knowledge sharing. Trust is related to levels of individual, group, technology, and organization.

Priority

Naturally, there is no enough time to complete all activities in a short period of time. In terms of importance, these activities are certainly different. The activities become important when they are prioritized. The subject is made very serious and resolute in terms of knowledge flow in order to improve the flow of knowledge in the organization. This requires prioritizing the activities and ensuring that users have sufficient time

to contribute. Therefore, from the previous literatures, this study developed three hypotheses:

Hypothesis 1: There is significant effect of knowledge sharing barriers on knowledge sharing in the university from the selected sample of the study.

Hypothesis 2: There is a significant correlation between the methods of reducing barriers of sharing the supply chain knowledge and the knowledge sharing itself from the selected sample of the university which are divided to the following:

- There is a significant correlation between the methods of solving the barriers of knowledge sharing and barriers at the individual level;
- There is a significant correlation between the methods of solving the knowledge sharing barriers and the barriers at the technical level; and
- There is a significant correlation between the methods of solving of knowledge sharing barriers and the barriers of sharing the supply chain knowledge at the organizational level.

Hypothesis 3: There is a significant impact of the methods of solving barriers on knowledge sharing in addition to barriers of knowledge sharing in the selected sample of the university. The hypothesis is divided into three:

- There is a significant impact of the combined methods used in addressing the barriers of knowledge sharing and the barriers at the individual level;
- There is a significant impact of the combined methods used in addressing the barriers of knowledge sharing and the barriers at the technical level; and
- There is a significant impact on the methods of addressing the barriers to knowledge-sharing combined in the constraints at the organizational level.

The importance of this study is derived from the objectives of the study which are the answers to the questions that represent the problem of the study and the results of the hypotheses tested. Therefore, the significance of this study is divided into two: theoretical and practical contributions. The theoretical contribution of this study comes from the benefits acquired by researchers seeking to uncover the barriers of sharing the supply chain knowledge and different ways to curb the barriers of sharing the supply chain knowledge. The study revealed that the hypotheses of the result of the relationship between knowledge sharing barriers and organizations are not accepted. The practical contribution encompasses the expected outcomes of the research problem in the direction of justifying or disproving the validity of research hypotheses as related to the result interpretation from knowledge sharing barriers in the

organization including the research sample and the methods of reducing of knowledge sharing barriers [19].

3. Methodology

The study used descriptive and analytical methods in the theoretical aspect of the research as a main approach due to its high suitability for this study and its application in practice. Data collection was done by distribution of form and were subsequently analysed using SPSS V23 to carry out descriptive analysis and appropriate tests for correlation study, identification and effects of the most significant barrier to knowledge sharing. Also, AMOS program was adopted for diagnostic and empirical analysis of the data. Questionnaire form was the research tool adopted which was designed on the basis of previous studies in this area in order to collect data that contribute to achieving its objective. Therefore, a number of descriptive statistical tools were used for the purpose of identifying the variables of the study and identifying the level of agreement of the individual variables in reference to other existing variables as shown in Table 1.

4. Result and Analysis

4.1 Descriptive Analysis

From the description of the population of the selected sample, the number of consulting offices is 6, the number of hospitals and clinics is 6, and the number of museums is 5 while the number of security departments, technical and administrative units is 6. From the total number of staff of 4281, the number of professor is 196, the number of assistant professor is 1014, and the number of teacher 1261 and the number of assistant teacher is 1810. Also, from the population of the student, the number of students in preliminary studies is 30000, the number of graduate students is 794, high diploma student is 85, and master's student is 575, while Doctor of Philosophy student is 134 students. The first year of academic in university of Mogul began with faculty of medicine in 1959 where the first building blocks were constructed. Nevertheless, the actual appearance of the University of Mosul as an educational institution based on the ground date back to the first of April in 1967, the day that 14 resolutions were issued on the establishment of Iraqi University on behalf of University of Mosul. It consists of 20 colleges, 7 research centres, 6 consulting offices, 5 clinics and 6 hospitals over the course of the years of its work. The University of Mosul seeks to achieve the objectives of the higher education in Iraq such as training 100 qualified national cadres in different scientific expertise and supporting the movement of scientific

research and community service. The University of Mosul offers bachelors and higher diploma and vocational diploma in the field of preparing cadres. Also, Master's and Ph.D. degrees in different scientific disciplines are distributed across various fields of specialization in the university departments. After the graduates are employed in the government department, they are being tracked by the university through

successive courses of the continuing education program and they constantly get updated through their knowledge on the latest discoveries.

Also, the research in its procedures was based on a questionnaire form, which was designed on the basis of many and specialized references in this research, in order to collect the data that contributes to achieving its objectives.

Table (2) Description of the questionnaire

Variable	Numbers of items	References
Barriers of sharing the supply chain knowledge		
Barrier at the individual level	14	(che:2010) (Razmerita et al:2016) (Clayton :2014)
Barrier at the technological level	13	(Riege:2006) (Kukko:2013) (Hartner&Gunfelder:2013)
Barrier at the organization level	15	(Leistner:2009) (Adamss:2011) (Anna :2013)
knowledge sharing barriers solution		
knowledge sharing barriers solution	13	(Hubert& Lopez:2013) (Riege: 2006) (Janus :2016)

4.2. Description of Variables of Knowledge-sharing Barriers

4.2.1. Knowledge-sharing Barriers at the Individual Level

From Table 3, the variables related to barriers at the individual level have a correlation of 93.756% and a standard deviation of 750.0. Also, the rate of agreement on the variables of barriers at the individual level ranged from 83% to 97%. The variable X1 and B (I am concerned about sharing my knowledge with others) have a response rate of 97% with a mean of 4.366 and a standard deviation of 0.77 and coefficient difference of 18%. The variable (X14) which is related to ethnic differences affects the sharing of knowledge with others, has a response rate of 97% with a mean of 4.27, a standard deviation of 0.75 and a coefficient difference of 18%.

4.2.2. Knowledge-sharing Barriers at the Technological Level

From the research sample presented in table 3, the variables of barriers at the technological level reached an agreement rate of 87.061% with an arithmetic mean of 4.746 and a standard deviation of 0.7430. Notably, the percentage of agreement on the barriers at the technological level ranged from 63.4% to 97.1%. The

variable X20 that the "IT systems appropriate to the need for work required" achieved an agreement ratio of 97.1%, standard deviation of 0.70 and coefficient difference 17%. In other word, the variable X15 that "the weakness of the integration of information systems" achieved an agreement ratio of 97% with a mean of 4.03, standard deviation of 0.62 and a coefficient difference of 15%.

4.2.3. Knowledge-sharing Barriers at the Organizational Level

As presented in Table 3, the variables related to knowledge sharing barriers at the organization level achieved an agreement ratio of 74.2% to 92.2% with a mean of 4.14 and a standard deviation of 0.702 and coefficient difference of 17.017% (97.30%). The variable X34 that "the current transparency of the college does not provide sufficient support for knowledge sharing practices" achieved a response rate of 97.1% (4.05), a standard deviation of 0.64 and the coefficient difference was 16%. The variable X28 of "the sharing of knowledge received little attention at the organizational level" achieved an agreement ratio of 97%, mean of 4.08, a standard deviation of 0.66 and a the coefficient of variation of 16%.

4.2.4. Methods for Addressing Barriers of sharing the supply chain knowledge

According to Table 4, the variables related to the methods of treatment of knowledge sharing barriers reached an agreement percentage of 85.0098% with the individual variable in the research sample with a mean of 4.5828, a standard deviation of 0.6721 and coefficient difference of 15.57%. The percentage of agreement on the variables of the methods of treatment of the barriers of sharing the supply chain knowledge ranged from 97%

to 98%. The variable X15 refers to “the support of the Deanship of the college in terms of knowledge sharing” on an agreement ratio of 98% with a mean of 4.12, a standard deviation of 0.59 and coefficient of difference of 14%. The variable X49 indicates “a new knowledge-based on the sharing of the knowledge obtained” on the percentage of agreement 97.1% with mean and standard deviation of 4.16 and 0.70 respectively of the countries and coefficient difference of 17%.

Table 3: Frequency and distributions of responses to the dimensions of knowledge sharing barriers

Variables	Answer scale										Arithmetic mean	standard deviation	Difference coefficient%
	Strongly Agree		Agree		Neutral		not agree		not agree strongly				
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%			
Barriers of sharing the supply chain knowledge													
a. Barrier at the individual level													
X₁	46	45.5	52	51.5	-	-	-	-	3	3	4.3663	0.77	18
X₂	63	62.4	21	20.8	14	13.9	-	-	3	3	4.40	.94	21
X₃	52	51.5	46	45.5	-	-	-	-	3	3	4.14	0.77	19
X₄	52	51.5	46	45.5	-	-	-	-	3	3	4.43	0.78	18
X₅	36	35.6	62	61.4	-	-	-	-	3	3	4.27	0.75	18
X₆	-	-	90	89.1	8	7.9	-	-	3	3	3.83	0.57	15
X₇	9	8.9	89	88.1	-	-	-	-	3	3	4.24	0.74	17
X₈	9	8.9	89	88.1	-	-	-	-	3	3	4	0.6	17
X₉	38	37.6	44	43.6	16	15.8	-	-	3	3	4.13	0.89	22
X₁₀	14	13.9	76	75.2	8	7.9	-	-	3	3	3.97	0.7	18
X₁₁	61	60.4	37	36.6	-	-	-	-	3	3	4.51	0.78	17
X₁₂	37	36.6	61	60.4	-	-	-	-	3	3	4.78	0.75	18
X₁₃	29	28.7	69	68.3	-	-	-	-	3	3	4.20	0.72	17
X₁₄	36	35.6	62	61.4	-	-	-	-	3	3	4.27	0.75	18
Total Indicator	34.078		59.678						3		4.2552	0.750	18.07
b. Barrier at the technological level													
X₁₅	12	11.9	86	85.1	-	-	-	-	3	3	4.03	0.62	15
X₁₆	-	-	-	-	8	7.9	67	66.3	26	25.7	1.82	0.55	30
X₁₇	36	35.6	62	61.4	-	-	-	-	3	3	4.27	0.75	18
X₁₈	33	32.7	57	56.4	8	7.9	-	-	3	3	4.16	0.81	19
X₁₉	52	51.5	12	11.9	-	-	34	33.7	3	3	3.75	1.45	39
X₂₀	24	23.8	74	73.3	-	-	-	-	3	3	4.16	0.7	17
X₂₁	25	24.8	73	72.3	-	-	-	-	3	3	4.16	0.7	17
X₂₂	20	19.8	78	77.2	-	-	-	-	3	3	4.11	0.68	16
X₂₃	39	38.6	59	58.4	-	-	-	-	3	3	4.3	0.76	18
X₂₄	27	26.7	71	70.3	-	-	-	-	3	3	4.18	0.71	17
X₂₅	15	14.9	83	82.2	-	-	-	-	3	3	4.06	0.65	16
X₂₆	22	21.8	90	89.1	-	-	-	-	3	3	4.13	0.69	17
X₂₇	8	7.9	90	89.1	-	-	-	-	3	3	3.9	0.59	15
Total Indicator	24.538		62.523						4.746		3.9315	0.7430	19.53
C. Barrier at the organization level													

X28	17	16.8	81	80.2	-	-	-	-	3	3	4.08	0.66	16
X29	22	21.8	76	75.2	-	-	-	-	3	3	4.13	0.69	17
X30	19	18.8	79	78.2	-	-	-	-	3	3	4.10	0.67	16
X31	5	5	93	92.1	-	-	-	-	3	3	3.96	0.56	14
X32	33	32.7	65	64.4	-	-	-	-	3	3	4.24	0.74	17
X33	33	32.7	65	64.4	-	-	-	-	3	3	4.24	0.74	17
X34	14	13.9	84	83.2	-	-	-	-	3	3	4.05	0.64	16
X35	32	31.7	66	65.3	-	-	-	-	3	3	4.23	0.73	17
X36	44	43.6	54	53.5	-	-	-	-	3	3	4.35	0.77	18
X37	37	36.6	54	53.5	7	6.9	-	-	3	3	4.21	0.82	19
X38	8	7.9	90	89.1	-	-	-	-	3	3	3.99	0.59	15
X39	20	19.8	69	68.3	9	8.9	-	-	3	3	4.02	0.75	19
X40	25	24.8	73	72.3	-	-	-	-	3	3	4.16	0.7	17
X41	41	40.6	45	44.5	12	11.9	-	-	3	3	4.20	0.87	21
Total Indicator	24.764		67.9785						3		4.14	0.7028	17.07

Table 4: Frequency and distributions of responses to the dimensions of the methods of treatment of knowledge sharing barriers

Variables	Answer scale										Arithmetic mean	standard deviation	Difference coefficient%
	Strongly Agree		Agree		Neutral		not agree		not agree strongly				
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%			
Extend methods of treatment of knowledge sharing barriers													
X42	24	23.8	74	73.3	-	-	-	-	3	3	4.15	0.7	17
X43	24	23.8	66	65.3	8	7.9	-	-	3	3	4.07	0.76	19
X44	20	19.8	78	77.2	-	-	-	-	3	3	4.11	0.68	16
X45	-	-	-	-	-	-	87	86.1	14	13.9	1.86	0.35	19
X46	8	7.9	90	89.1	-	-	-	-	3	3	3.99	0.59	15
X47	27	26.7	71	70.3	-	-	-	-	3	3	4.18	0.71	17
X48	31	30.7	67	66.3	-	-	-	-	3	3	4.22	0.73	17
X49	25	24.8	73	72.3	-	-	-	-	3	3	4.16	0.7	17
X50	32	31.7	66	65.3	-	-	-	-	3	3	4.23	0.73	17
X51	18	17.8	81	80.2	-	-	-	-	2	2	4.12	0.59	14
X52	39	38.6	59	58.4	-	-	-	-	3	3	4.30	0.76	18
X53	27	26.7	71	70.3	-	-	-	-	3	3	4.18	0.71	17
X54	15	14.9	83	82.2	-	-	-	-	3	3	4.06	0.71	17
X55	22	21.8	76	75.2	-	-	-	-	3	3	4.13	0.6721	17
Total Indicator	17.257		67.7528						3.778		4.5828	0.6721	15.5714

Source: Prepared by the researcher

4.3. Results on Global Analysis Test for Knowledge Sharing Barriers in the Organization

It is necessary first to conduct an appropriate study of sample size and correlation matrix to complete the rest of the exploratory analysis procedures before the objectives of this study can be achieved as shown in Table 5.

Table 5: The sample size and correlation matrix

	Value	Standard	Judgment
correlation matrix	0.004	More than 0.00001	Good
Bartlett,s test	0.00	Lower than 0.05	Important
(KMO Test)	0.739	More than 0.5	Good
Measures of Sampling Adequacy	0.974-0.938	More than 0.5	Good

Source: The table prepared by the researcher to adopt the results of the analysis

The value of the correlation matrix is 0.004 from the Table 5 which is greater than 0.00001. This shows that there is no linear dependence between the rows and columns of the matrix and there is absence of high and weak relationship between the variables. There is a function of Bartlett which implies that the link matrix has a low relationship with single matrix i.e. not relationship-free; it is valid for global analysis. Thus, Bartlett is a necessary condition but not sufficient to judge the correlation matrix for analysis. Therefore, the Kaiser-Meyer-Olkin (KMO) test which is a general measure of efficiency was used. As the correlations are generally within the required level, it means the correlation is significant. The KMO test with the value of 0.739 shows, that the sum of the squares of the correlation coefficients between the variables is greater than the sum of the squares of the partial correlation coefficients. This is a

general measurement at the level of the matrix. At the level of each variable, the MSA is used for the efficiency of the assignment. A wide range of variables is provided by the MSA with a set of values T (0.974 - 0.398) found at the bottom of the table (Anti-image Matrices). The coefficient of correlation between each variable with other variables is sufficient to conduct the global analysis in the correlation matrix. Also, all the sample size and correlation matrix parameters were in good function. The value of the calculated CI box was 549.957 (7.82) at a freedom level of 3 and at a significant level of 0.05.

4.3.1. Reduction of Factors and Interpretation of Variance for Barriers of sharing the supply chain knowledge

Table 6: Reduction of Factors and Interpretation of Variance

Component	Initial Eigen Value			External Sum Of Squared Lodgings		
	Total	% Of Variance	Cumulative	Total	%Of Variance	Cumulative
1	2.917	97.230	97.230	2.917	97.17	97.230
2	0.03	2.100				
3	0.020	0.669				

Source: prepared by the researcher to adopt the results of the global analysis program

The reduction of factors and interpretation of variance are presented in Table 6. The three factors that are barriers of sharing the supply chain knowledge are reduced to one factor, C1. The C1 represents barriers at

the individual level. According to the global analysis, using the statistical program SPSS (V23), factor C1 explains 97.230% of the variance, which is supported by the graph obtained from the analysis of data [21].

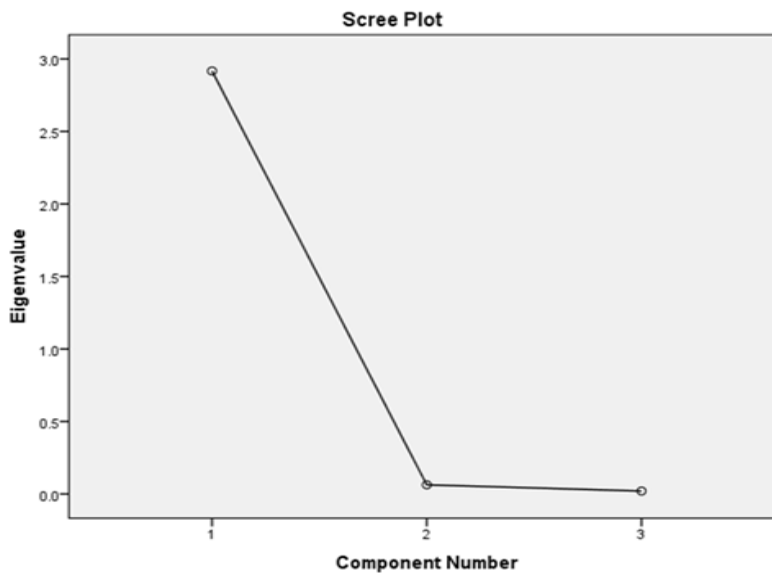


Figure 1: The explanatory factor

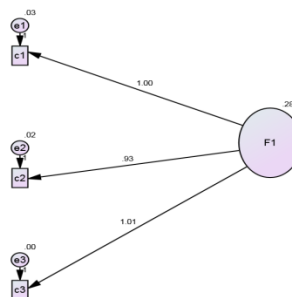
Table 7: Component Matrix (Factors)

	Component	
	1	
C1	0.993	
C2	0.984	
C3	0.981	

Source: Prepared by the researcher

Table 7 reveals that, C3 is the largest composition of the explanatory factor of value 99.3% followed by C2 with the composition of the explanatory factor 98.4% and finally C1 which is the composition of the explanatory factor 98.1%. Thus, this study completed the exploratory analysis using the SPSS program. AMOS program is employed for the purpose of accessing empirical

analysis. With the use of AMOS, the format that will be shown through data processing will support the results presented in Table 7. The following figure shows the output regarding the factor matrix after processing the data using AMOS program. Therefore, the first major hypothesis of research at the university level is accepted based on the above result.



Source: Data processing results using Amos software

4.3.2. Test of Correlation between the Research Variables at the University Level

Positive correlation between the dimensions of the methods of treatment of knowledge sharing barriers and knowledge sharing is shown in Table 8. The total index

of correlation coefficients of 0.960 shows that, interest in methods of treatment of knowledge sharing barriers will contribute to the treatment of such barriers. The above statement shows that the second main hypothesis at the level of the University of this Study is accepted.

Table 8: The correlation between the research variables at the level of the university

Dependent variable \ Independent variable	Barriers of sharing the supply chain knowledge			Total Indicator
	Barrier at the individual level	Barrier at the technological level	Barrier at the organization level	
Barriers of sharing the supply chain knowledge solution	0.915**	0.966**	0.961**	0.960**

Relationship between methods of solving knowledge sharing barriers and each dimension of the barriers of sharing the supply chain knowledge can be identified in Table 8 as follows:

- The relationship between the methods of solving barriers of sharing the supply chain knowledge and barriers at the individual level: table 8 shows a positive correlation between the individual-level barriers as a dependent variable and the methods of treatment of knowledge-sharing barriers as an independent variable. The correlation coefficient (0.915**) shows that knowledge contributes to strengthening and solving barriers at the individual level.
- The relationship between the methods of solving barriers of sharing the supply chain knowledge and barriers at the technological level: Table 8 shows a positive correlation between the technological-level barriers as a dependent variable and the methods of treatment of knowledge-sharing barriers as an independent variable. The correlation coefficient (0.966**) shows that knowledge contributes to strengthening and solving barriers at the technological level.

- The relationship between the methods of solving barriers of sharing the supply chain knowledge and barriers at the organizational level: Table 8 shows a positive correlation between the organizational level constraints as a dependent variable and the methods of solving knowledge sharing barriers as an independent variable. The correlation coefficient (0.961**) indicates that knowledge contributes to strengthening and solving barriers at the organizational level.

Based on this conclusion, the second main hypothesis which states that “there is a significant correlation between the methods of solving the barriers of sharing the supply chain knowledge combined and the barriers of sharing the supply chain knowledge in the university faculties is accepted. Also, the ramifications of the hypothesis are accepted.

4.3.3. Analysis of the impact of the methods of solving barriers of sharing the supply chain knowledge at the level of the university

The results of the statistical analysis show that there is a positive effect on the methods of solving barriers of knowledge sharing combined with knowledge at the level of the faculties of the university as shown in Table 9.

Table 9: The impact of the ways knowledge sharing barriers affect the method of knowledge sharing at the level of the faculties of the university

Dependent variable \ Independent variable	Barriers of sharing the supply chain knowledge solution		R ²	F value	
	0 β	1 β		Calculated	tabular
	1.001 (34.136)*	0.960	0.922	1165.24	3.9201

(*) Indicates the calculated t value P 0.05 0.05 df (1.99)

The results of the regression analysis show that there is a significant effect on the methods of solving knowledge sharing barriers in the shared knowledge. The tabular value of F (3.9201) (0.05) is lower than the calculated value of F (1165.248). This result shows that the effect of the independent variable is significant. The methods of solving the barriers in the variable adopted the knowledge sharing barriers. The coefficient of selection valued 0.922 means that 92.9% that explains the barriers

of sharing the supply chain knowledge are the methods of solving barriers of sharing the supply chain knowledge and the remaining is due to random variables T (34.136) with significant value higher than the tabular value of (1.658) at the level of (0.05) and degree of freedom (1.99). In accordance to the above, the third main hypothesis is accepted at the level of the university faculties.

4.3.4. Impact of Methods of Addressing Barriers in Knowledge Sharing

Table 10: Impact of methods of addressing barriers in knowledge sharing

Dependent variable Independent variable	Barriers of sharing the supply chain knowledge				F value	
		β_0	β_1	R ²	Calculated	Calculated
	Barrier at the individual level	1.006 (22.510)*	0.915	0.837	506.791	3.9201
	Barrier at the technological level	1.029 (37.094)*	0.933	0.933	1375.961	3.9201
	Barrier at the organization level	0.969 (34.69)*	0.961	0.961	1203.399	3.9201

() Indicates the calculated t value (P 0.05 0.05 df) 1.99

Source: Prepared by the researcher based on the results of the computer using SPSS V 23

1. The impact of the solving barriers of sharing the supply chain knowledge during knowledge sharing at the individual level:

From the result, there is a significant effect between the methods of solving knowledge sharing barriers as an independent variable and barriers of sharing the supply chain knowledge at the individual level as a dependent variable. As shown in Table 10, this result is supported by the calculated value F (506.719) (3.9201) at the degrees of freedom (1, 99) and at a significant level (0.05). It implies that there is a significant effect between the independent variable and the dependent variable. The value of the R-squared (0.837) explained the differences between barriers at the individual level by methods of solving knowledge sharing barriers. Others are due to variables that are above acceptance level of value of T. It is found that there is a significant effect on the methods of solving knowledge sharing barriers during knowledge sharing at the individual level. It is clear that the calculated value of T and the maximum value (22.510) are significant as they are greater than the tabular value and the maximum value (1.684) at the level of significance (0.05) with the degrees of freedom (1, 99).

2. The impact of the solving barriers of sharing the supply chain knowledge during knowledge sharing at the technological level: From the result, there is a significant effect between the methods of solving knowledge sharing barriers as an independent variable and barriers of sharing the supply chain knowledge at the technological level as a dependent variable. As shown in Table 10, this result is supported by the calculated F value (1375.961) (3.9201) at the degrees of freedom (1, 99) and at a significant level (0.05). It implies that there is a significant effect between the independent variable and the dependent variable. The value of the R-squared (0.933) explained the differences between barriers at the technological level by methods of solving knowledge sharing barriers. Others are due to variables that are above acceptance level of value of T. It is found that there is a significant effect on the methods of solving knowledge sharing barriers during knowledge sharing at the technological level. It is clear that the calculated value of T and the maximum value (37.094) are significant as they are greater than the tabular value and the maximum value (1.684) at the level of significance (0.05) with the degrees of freedom (1, 99).

3. The impact of the solving barriers of sharing the supply chain knowledge during knowledge sharing at the organization level: The impact of the solving barriers of sharing the supply chain knowledge during knowledge sharing at the technological level: From the result, there is a significant effect between the methods of solving knowledge sharing barriers as an independent variable and barriers of sharing the supply chain knowledge at the technological level as a dependent variable. As shown in Table 11, this result is supported by the calculated F value (1203.399) (3.9201) at the degrees of freedom (1, 99) and at a significant level (0.05). It implies that there is a significant effect between the independent variable and the dependent variable. The value of the R-squared (0.961) explained the differences between barriers at the technological level by methods of solving knowledge sharing barriers. Others are due to variables that are above acceptance level of value of T. It is found that there is a significant effect on the methods of solving knowledge sharing barriers during knowledge sharing at the technological level. It is clear that the calculated value of T and the maximum value (34.69) are significant as they are greater than the tabular value and the maximum value (1.684) at the level of significance (0.05) with the degrees of freedom (1, 99).

5. Conclusion and Recommendation

5.1 Conclusion

From the result and analysis of this study, it is then concluded that:

- From the theoretical perspectives of this study, many previous studies have discussed issue of knowledge sharing and the barriers of sharing the supply chain knowledge. This shows the significance of the study which is instrumental to the researcher in the field of knowledge management. The methods of addressing the barriers of sharing the supply chain knowledge however have not been fully employed. The methods used in addressing the barriers associated with knowledge sharing are equally important.
- From the practical analysis, it is revealed that the individual level consists of the main barriers of sharing the supply chain knowledge in the selected population of the study [20]. This shows that, there are real problems on the knowledge-sharing processes at the individual level. Thus, this has a clear effect on the success of knowledge sharing processes. Otherwise, barriers can emerge at the individual level to share knowledge.
- Also, at the individual level, the barriers of sharing the supply chain knowledge have a clear

impact on the emergence of other barriers such as: technical barriers and organizational barriers. The lack of knowledge sharing among individuals turns out to generally affect the system as a whole at the level of the organization and knowledge gaps will increase between level of individual and technology. Therefore, sharing of knowledge will affected both in both technological and organizational levels as a whole.

- Finally, this study concluded that the methods of solving the barriers of sharing the supply chain knowledge have a significant impact on reducing those barriers. To promote knowledge sharing and reduce the negative impacts of shared knowledge at various levels, motivation, training, trust, awareness and culture are crucial factors to be emulated.

5.2 Recommendation

The study recommended the following:

- The motivation and encouragement of employees are necessary in emphasizing the importance of sharing knowledge. The employees should be given sufficient confidence and trained well in the process of sharing knowledge in a way that leads to the organizational culture.
- There is constant need to reassure the employees that their knowledge-sharing efforts will not be in vain and that the administration will focus on appreciation and evaluation of their efforts. They need to be constantly reminded that their future career and their positions have positive impacts on the organization.
- There should be focus on addressing the barriers of sharing the supply chain knowledge at the individual level due to two concerns. First one is the direct addressing of barriers of sharing the supply chain knowledge at the individual level. The decline of knowledge-sharing barriers at the technological level and organizational level is the second concern as this will automatically and positively affect the decline in barrier of knowledge-sharing at the individual level.
- The analysis of the barriers of sharing the supply chain knowledge at the technological and organizational levels should be paid attention in order to minimize the barriers at the individual level. From the global analysis, the result shows that barriers at the technical level and the barriers at the organizational level have prominent roles in the knowledge sharing barriers at the individual level.

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