

# Knowledge Sharing Technologies to Enhance Employees' Performance in Organizations

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Knowledge sharing adoption has become the main criterion for any organization's development. This study proposed a suitable collaborative model for implementing intelligent knowledge sharing techniques to enhance employees' performance in GDE-Babylon, Iraq. The study also discusses potential knowledge-sharing barriers, categorizing them into three main domains of recently published works: individual/personal, organizational, and technological barriers. The research used a mixed method approach, combining both qualitative and quantitative data. The study also, utilizes the quantitative methodology in the form of data collected via a survey to identify the challenges faced by the employees in adopting knowledge sharing behavior. Additionally, the study adopts the qualitative method in the form of interviews conducted with four top management in GDE. The results of this study, most employees believe in the need to share knowledge but Knowledge sharing is not part of the GDE's culture, supporting senior management is insufficient to provide an appropriate environment for knowledge sharing as well as lack financial support as there are no rewards or financial allocation for these activities even moral support is not encouraging. The authorities of GDE must be more seriousness to eliminate the concerns of some employees that sharing their knowledge with others will lose their strengths and position as well as they need invest in IT as one of the most important pillars of knowledge sharing.

**Keywords:** Knowledge sharing; individual factors; organizational factors; technology factors.

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## 1. Introduction

Nowadays, organizations need for policies and clear strategic plans suitable for rapid developments, due to the rapid aging of the population, technological advancements, globalization, and increasing competition [1]. Sharing knowledge in both its formal and informal terms represents the transfer of valuable individual skills and information, and then sharing and disseminating it among other members of the organization. [2]. Knowledge sharing has become the worthy indicators to measure of organizational performance. [3]. Many researcher [3–5] reached that Knowledge sharing is the way to knowledge management success. Furthermore, they suggested encouraging the employees and motivate them to share their knowledge in case they have

more productive knowledge do not participate with others. Fig. 1 shows that knowledge consists of two types which are tacit and explicit. Tacit knowledge is un-codified and resides in people's mind which can be dexterity, technical proficiency, know-how and experience. The transfer and sharing of knowledge is done in various ways such as training, team participation, direct guidance or joint work in projects. While saving and sharing the explicit knowledge usually easier through physical components such as books, archives, database systems, digital tools, etc., which can be used later easily [6].

However, different practices and tools to foster knowledge sharing have been identified. These include, among others, technological aids, such as knowledge portals, dif-

ferent boundary objects and virtual communication tools, and managerial actions, such as recognition and rewarding schemes [7]. Zhang (2017) proposed a model demonstrates a reciprocal focus where recipients of knowledge are rewarded, as is the person who shares knowledge [8]. Fig. 2, illustrates the steps for sharing the four knowledge and experiences with the activities of each step [9]. According to Bulan and Sensuse (2013), the importance of Knowledge Sharing: (1) creating new knowledge. (2) strength to continue knowledge. (3) Spreading the knowledge in one part of the organization to other parts it lacks. (4) foster to invest in IT, job and social [10]. In addition, knowledge sharing brings many benefits to the organization's performance through rapid access to problem solving, human capacity building, embrace innovation, and the generation of new ideas from shared knowledge [11]. Furthermore, collective intelligence techniques can connect people and computers to create the added value, many academics and researchers consider that the collective intelligence can facilitate knowledge sharing and management [12].



**Fig. 1.** Type of knowledge

On the other hand, many challenges faced to exchange knowledge among employees. Many organizations have not been able to achieve their goals due to these challenges. In line with some researchers [12, 13] barriers can be classified as three parts, First: Individual Barriers such as (1) Lack of Trust. (2) Personal attitude. (3) Subjective norms. (4) Personal expectation. (5) Lack of rewards. (6) Lack of time. (7) Staffs are reluctant to seek knowledge from their seniors because of the fear. (8) Misused of knowledge. (9) Misunderstanding the value and benefit of knowledge sharing. (10) Knowledge is power. (11) Poor verbal/ written communication and interpersonal skills. (12) Affective commitment. (13) Affiliation. (14) Reciprocal Relationship. (15) Peer pressure. (16) Motivation and opportunities to share; Second: Organizational Barriers such as (1) Organizational support. (2) Incentive system. (3) Management system. (4) Organizational culture. (5) Quality of the place and space. (6) Lack of formal and informal activities. (7) Physical work environment. (8) Management support. (9) Lack of Team spirit.; Third: Technological Barriers Knowledge such as (1) IT Application. (2) IT for knowledge sharing (collaboration). Distributed Model. (3) Information technological

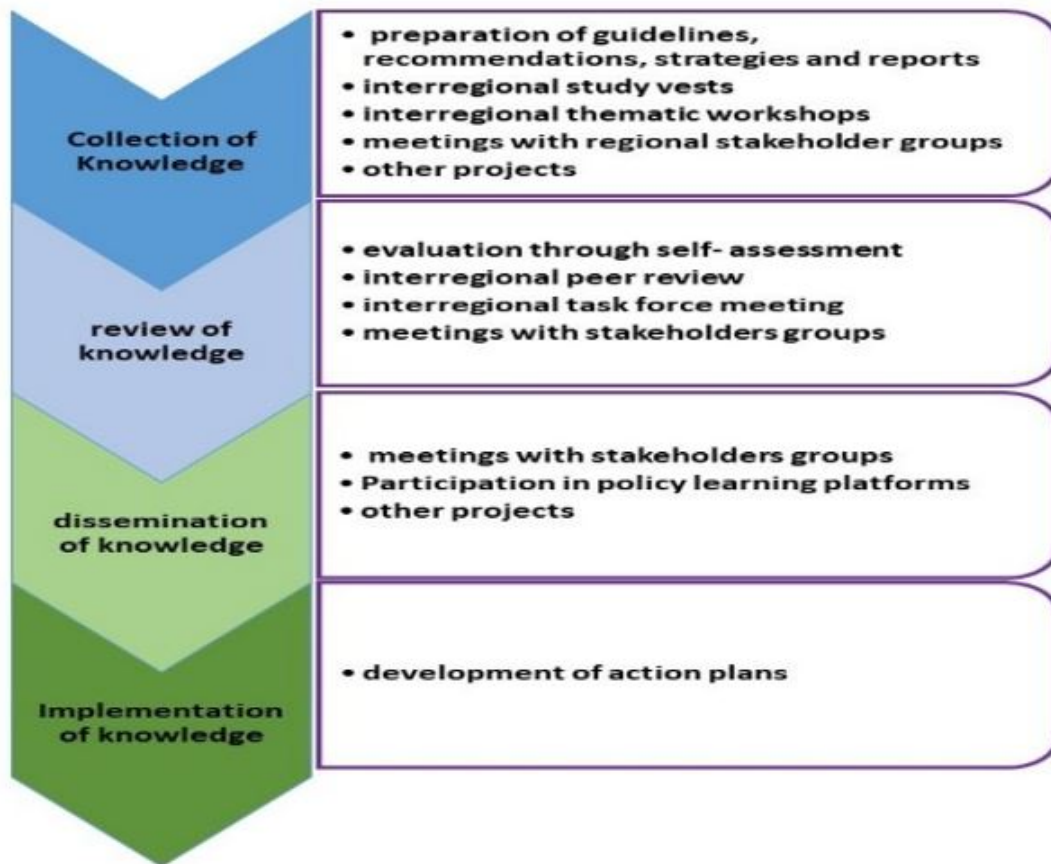
literacy.

## 2. Related Work

MOHAJAN (2019) presented a two-dimensional process model to share and exchange their tacit and explicit knowledge with members of staff [12]. The model touched on what you learned and how and shared it with others, but it did not address the factors that affect this participation, negatively or positively. Kader Jilani et al. (2020) presumed a model for knowledge sharing that a monopoly of knowledge, skill and strong and medium influences and its reflection on knowledge sharing and performance development [14]. They tried to demonstrating the importance of knowledge hiding, along with explaining how knowledge sharing can motivate and influence employees to achieve sustainable performances, but this model did not refer to the effects of the organization and the technology. Whereas Farooq (2018) believes, through the model it designed, that the satisfaction of the employees and parties involved inside and outside the organization is the success that the organization has achieved because it will lead to quality and innovation but the Influencing factors were limited in the designed model [15]. Furthermore, Lin & Huang (2020) shows that team members need to have intellectual, social, and demographic heterogeneity in order to reach an effective sharing of knowledge. [16]. This research tried to develop a model to promote employees' sharing for knowledge in General Directorate of Education (GDE) in Babylon, Iraq (Case study). This model is not limited to identifying the influencing factors, it includes practical steps to implement a dedicated knowledge, sharing platform among the GDE's employees. Additionally, the study tries to explore and describe the challenges and influential factors that effect of sharing of knowledge among employees and reformulated them in a way that matches the work of the GDE and Iraqi environment. As well as continuous monitoring and evaluation to reduce the impact of the surrounding barriers and factors to improve knowledge sharing platform in GDE.

## 3. Methodology

This research uses study of literatures from published research, previous articles, books, dissertation, related conferences and some reports issued before this study. In this study, we have attempted to cover several aspects of knowledge exchange. The study adopted a mixed method, it utilizes the quantitative methodology for data collection. The participants were employees in General Directorate of Education (GDE) in Babylon, Iraq. Participating staff from multiple departments participated voluntarily and



**Fig. 2.** Steps of knowledge sharing [9]

were informed of the purpose of the research in advance. Additionally, the study adopts the qualitative method in the form of interviews conducted with general director and five directors of departments in GDE. The interview was conducted using Google Form, as all Iraqi organizations were unemployed due to the Coronavirus epidemic in these days. In line with many researchers [17–19] we employed Yamane’s formula to calculate the sample size which will be used to further determine the representative proportion in the GDE. SPSS is a perfectly adequate tool for entering data, creating new variables, and performing formal statistical analyses, and thus SPSS was used for data analysis.

#### 4. Data Analysis and Discussion

Most employees consider sharing knowledge important to them, as the ratio has reached (89.19 %). While poor percentage gained for GDE organization’s reward system (54.59 %) and lack brainstorming sessions (58.92 %) to find new ideas and methods to solve existing problems and

develop policies to reach performance improvement. The interpretation of percentage for this part of the finding is based on these percentages where Excellent (90-100 %), Very good (80-89 %), Good (60-79 %), and Poor (0-59 %) [18]. These distinctions are used to represent the respondent’s knowledge with regard to the particular statement. The results of the Knowledge sharing among employees GDE-Babylon, Iraq are shown in Table 1.

Furthermore, employees Not finding enough support from senior management to share knowledge. The results in Table 2 show absence of a clear strategy for sharing knowledge and the absence of any financial allocation for this purpose. Employees think that top management should be provide funds other sources to support and provided knowledge platforms encourage the collaborative behaviour to improve GDE performance. In addition to, lack the monitoring and evaluate the outcomes of our knowledge sharing Inside and outside the GDE organization.

The results of survey reached that respondents believe that communication technology is the pillar in an organization with respect to knowledge sharing. Generally, the GDE

**Table 1.** Knowledge Sharing in GDE- Babylon, Iraq.

Statements	Mean	%
Knowledge sharing is important for me.	4.46	89.19
Our GDE promotes effective knowledge exchange.	3.73	74.59
Culture to share knowledge is a main pillar in our GDE.	3.73	74.59
The organization has a reward system (provides incentives).	2.73	54.59
We have the right mind-set to listen before sharing knowledge.	3.81	76.22
Our GDE facilitates knowledge sharing events regularly at all levels.	3.57	71.35
Our GDE provides opportunities and location for informal KS.	3.16	63.24
Our GDE invests social media in systematically for sharing knowledge.	3.73	74.59
we have a local platform that facilitates sharing knowledge.	3.22	64.32
Our GOD has management, carry out and oversight of the KS process.	3.32	66.49
The responsibilities and roles in our GDE are specific and clear to the employees.	3.41	68.11
Our GDE has a dedicated knowledge sharing team.	3.19	63.78
To what extent does it embrace knowledge sharing from top management.	3.38	67.57
All departments actively involved in knowledge sharing.	3.22	64.32
Getting and sharing knowledge is the foundation of every employee's work.	3.41	68.11
Knowledge sharing is a key component of employees "appraisal system.	3.14	62.70
Our GDE assigns advisors to new employees to help them in speed learning.	3.84	76.76
Staff at GDE share discussions and ideas through Internet.	3.30	65.95
In our GDE, Organize meetings to solve problems through brainstorming sessions.	2.95	58.92
Staff at GDE share their experience and knowledge with other organizations.	3.08	61.62

**Table 2.** Leadership, Budgets, Culture, and Evaluation.

Statements	Mean	%
Leaders in the GDE believes in sharing knowledge as a success component.	3.86	77.30
Our managers embrace knowledge sharing as a role model.	3.46	69.19
Our managers encourage KS and realize the value of prime behaviour.	3.43	68.65
The behaviour of staff/ teams of a cooperative is rewarded for it.	3.41	68.11
Staff at GDE trust each other to ask questions and come up with solutions	3.54	70.81
knowledge sharing part of everyone's job description.	3.51	70.27
knowledge sharing discussed during performance reviews.	3.49	69.73
Budget includes an allocation for knowledge sharing in GDE.	2.95	58.92
the budget aligned with our knowledge sharing strategy.	2.78	55.68
Accounts are allocated a budget for the time allotted to share knowledge.	2.70	54.05
The GDE has clarity on the need for infrastructure to exchange knowledge.	2.95	58.92
Knowledge exchanges at GDE require additional financial financing.	4.03	80.54
The GDE has a continuous approach to measuring the results of KS.	2.89	57.84

organization need more (hardware/software) to improve IT infrastructure. The Internet is not available to most employees because the senior management believes that it negatively affects the performance of their original duties. Also, staff see that Knowledge sharing can be increased the teamwork and the training help them to share their expertise and knowledge. The results of IT Infrastructure, KS Policies, and Practices as Table 3 illustrated.

Interviews with the educational leaders are aimed at understanding the challenges and opinions of the leaders about the knowledge sharing and the influential factors. Six specific questions about knowledge sharing were raised to four educational leaders: the general director of education in GDE-Babylon, the director of educational planning, the director of educational supervision, and the director of preparation and training in the same GDE organization.

**Table 3.** IT Infrastructure, KS Policies, and Practices.

Statements	Mean	%	Statements	Mean	%
Internet connection is available so that I can share information with others employees at work.	3.16	63.24	Top management supports the exchange of knowledge in the proceedings, not only through the logos.	3.49	69.73
Computerized information systems are available and can be accessed to share information with others.	3.59	71.89	The organization encourages employees to participate in setting goals.	3.32	66.49
The organization generally has a good infrastructure (hardware/software).	3.49	69.73	The organization encourages employees to share knowledge and experience.	3.30	65.95
Databases are available and I can search for the information that I need.	3.14	62.70	The organization gives rewards for knowledge sharing behaviors.	2.95	58.92
The GDE has central for knowledge easy to access and use (DB, intranet).	3.49	69.73	Knowledge sharing increased the teamwork.	4.54	90.81
The GDE has IT application for individual and intellectual connect (skills gain, Intranet, blogs, etc.)	3.32	66.49	Training allows me and my colleagues to share expertise and and knowledge.	4.38	87.57
The organization has a library/Resource center.	3.46	69.19	We share knowledge during the break.	3.78	75.68
Knowledge sharing infrastructure and equipment (Internet and intranet) is easily available to all employees.	3.05	61.08	We share our knowledge with our colleagues often by e-mail.	3.30	65.95

Google forms was used due to the inability to face-to-face interviews due to the outbreak of Coronavirus and the disruption of movement in all Iraqi organizations. The results of interviews as Table 4 illustrated.

## 5. Overview and Proposal Model

The proposed model is divided into three major parts, namely; influential factors, Measure and improve Successful Knowledge Sharing, and Knowledge Sharing Implementation using intelligent techniques such as knowledge acquisition systems, electronic discussions, simulations, management information systems, expertise locating systems, video conferencing and information repositories including databases and decision support systems. This technique is based on several steps are technology, establish objectives and strategy, prepare for change, define processes, and foster a KS culture. The model parts along with their underpinning activities are shown in Fig. 3. The model developed in this study helps employees in GDE-Babylon, Iraq to develop their capabilities to overcome the obstacles they face during work and gain new knowledge and guides them to the correct steps to share their knowledge. The model will also help reduce the loss of knowledge and

skills from employees who leave the job for several reasons by developing practical steps to transfer it to newly hired employees. Certainly, previous studies have identified many factors that affect employee knowledge exchange. The study has reclassified these factors to suit the GDE situation and environment based on a result of qualitative and quantitative this study. In line with [15, 20], we have categorized these factors into three parts: organizational, human and technological.

### 5.1. Organizational Factors

**Culture:** The prevailing rules and events exercised by the employees of the organization to reach achieving the goals of the organization [15, 20–23].

**Policy:** Are the outlines that are followed by senior departments and employees and it is necessary to include knowledge sharing before applying it [10].

**Structure:** the structural mechanisms of knowledge sharing on leadership, participation, and decision-making. Finally, relationships with other organizations [15, 21].

**Trust:** mutual trust in a career encourages the sharing of knowledge [10, 15, 22].

**Motivation:** attention and encouragement to increase employee motivation to share knowledge and expertise, espe-

**Table 4.** Questions and Qualitative results from interviews.

Interviews' Questions	Qualitative results from interviews
Does the GDE have a specific strategy for sharing knowledge?	Yes, through training courses and workshops, attended by supervisors, staff and people officials to exchange knowledge between them
How does the GDE monitor and measure the impact of knowledge sharing?	<ul style="list-style-type: none"> <li>• By communicating with employees 'work and the progress of their work and the results of their prepared plans during the time periods set by them to accomplish these actions</li> <li>• By reflecting its impact on employee performance</li> <li>• Through the employees carry out their duties scientifically and objectively, the percentage of errors in the work.</li> <li>• This can be tracked through performance evaluation conducted periodically and for all job levels.</li> </ul>
Is staff sharing knowledge a challenge? What are the most prominent challenges (if any)?	<ul style="list-style-type: none"> <li>• employees do not want to develop himself and get new skills and knowledge</li> <li>• Routine</li> <li>• Some employees consider the knowledge a private owned</li> <li>• lack the means of knowledge sharing</li> <li>• the weak general culture among many employees</li> <li>• the number of employees do not welcome with everything new.</li> </ul>
Do you think department managers encourage employees to actively share knowledge to prevent monopoly of important knowledge?	<ul style="list-style-type: none"> <li>• Yes, through employee evaluation and thanks and praise</li> <li>• Yes, through encouragement and praise, and thanks.</li> <li>• Motivating employees to share knowledge</li> <li>• Employees training by head of section</li> </ul>
What are the results of using social media within the organization to share knowledge?	<ul style="list-style-type: none"> <li>• Social media programs help to facilitate knowledge sharing</li> <li>• Lack of time for dialogue, acquisition and sharing of knowledge</li> <li>• Some employees are not familiar with computer and internet matters.</li> <li>• Most of our departments are not suitable for KS due to their buildings poor communication networks.</li> </ul>
What are the main challenges that the GDE faced with sharing knowledge by using social media?	Yes, but by specifying that it could be the reason for the employees preoccupation with the performance of their job duties and thus turn into a disruption to work.

cially implicit [10, 15].

**Fairness and justice:** The achievement of justice and equality supports the voluntary participation of individuals in the organization in their knowledge [12, 15, 22].

**Strategy:** senior management is responsible for developing strategies to suit the organization's vision for knowledge exchange [15].

**Leadership commitment:** Leaderships to manage the organization with all its resources to achieve the goals, including the exchange of knowledge [10, 12].

**Time:** Communication and knowledge exchange takes time. Many vital employees who possess knowledge do not find the time to communicate and share their knowledge or access to sources of knowledge. [21].

**Reward:** Financial support and self-encouragement to increase the desire of the organization's members to share their knowledge and experiences with their colleagues [15, 20, 22].

**Communication/ interaction climate:** providing a com-

fortable environment for employees to exchange their experiences and interact with each other directly or indirectly [22].

**Management Support:** Successful organizations that have leaders with the ability to stimulate knowledge sharing without pressure or coercion [15, 21].

**Office layout:** the workplace is laid out facilitate encounters. The office layout encourages casual, non-threatening, social interaction among employees [10, 21].

**Demographics:** Social differences, gender difference, education level, age and race differentiation, and standard of living affect in KS [20, 22].

**Organization size:** firm size influence on knowledge sharing, this size is directly proportional to the exchange of knowledge [23].

**Team:** demographic homogeneity of the team is important in increasing the exchange of ideas, knowledge and experience [12, 15].

**Training:** transferring experiences and skills from individ-

ual to group through direct and indirect communication [22].

## 5.2. Human Factors

**Psychological ownership:** the inner convictions of individuals and their reflection on sharing knowledge in the organization [22].

**Personality:** the nature of personality, such as openness, anticipation, and responsibility, has an effect on the exchange of knowledge [10, 15].

**Intrinsic Motivation:** the internal feeling of the members of the organization of belonging to it will have a positive impact for the exchange of knowledge [12, 15, 24].

**Social Capital:** relationships through social networks have a positive impact on KS [12, 15].

**Self-efficacy:** an individual's ability to address potential situations and implement actions [20].

**Fear:** monopolistic mentality and lack of knowledge sharing is caused by fear of losing their importance and value [24].

**social Trust:** satisfaction and safety in social media has a beneficial effect on the KS [20].

**Social structures:** employees with more similarities in a social media environment are more likely to share their knowledge with each other than with non-similar employees [24].

**Masculinity:** societies differ in their perception about gender, seizing opportunities to obtain a good job for males more than females [23].

**Job satisfaction:** the positive environment and functional interaction of any organization increases the opportunity to share knowledge [10, 12, 23].

**Altruism:** the behavior adopted by some individuals to give without waiting for returns [10, 12].

**Willing to share:** self-preparedness to communicate and share its intellectual capital, even with those who do not have a desire to do so [10, 12].

**Top Secret:** In organization, there are or maybe have top secret information which cannot be share. This classified "Top Secret" information and knowledge which keep in organizations have a high value [25].

**Position:** employees in higher departments are more interested in sharing their knowledge than lower-level employees [23].

**Leadership Traits:** leadership charisma has an important influence on imposing organizational policies to achieve its goals in sharing knowledge [22].

**Absorptive capacity:** complementary knowledge or individual absorptive capacity [21, 26].

**Self-interest:** all the individual factors have positive relationships to knowledge sharing behavior. In contrast, self-interest have negative relationships with this behavior [26].

**Reciprocity:** this behavior of treating individuals as they do has two sides, positive and negative, according to the response of the other party [12].

**Reputation:** paying attention to some people to have intellectual capital that motivates them to share their knowledge [12, 22].

**Awareness:** understanding the importance of sharing knowledge is the feeling required of all employees at all levels [10].

## 5.3. Technology

**IT Infrastructure:** technological tools and application programs available in the organization and human capabilities to communicate and exchange knowledge between employees in this organization [10, 20, 22].

**Information Communication Technology (ICT):** the media needed to access and share explicit knowledge resources across space and time [10, 12, 15].

**IT Support:** communication and sharing of knowledge requires a technical support team to address current solutions and facilitate technical procedures [12, 15].

**IT uses:** access to sources of knowledge requires the ability to use modern technological tools and smart devices for the purpose of benefiting and sharing them [10, 20].

**IT application:** programs, digital platforms, and endpoints that members of the organization need to access sources of knowledge [10].

Certainly, most organizations have started providing their own platform. This platform is the main source of knowledge and can be accessed by all members of the organization, each according to its validity. Through this platform, it is possible to capture, preserve and share knowledge, thus overcoming the problem of losing knowledge and expertise of employees who will leave the organization for any reason. This study classified the key steps to implement a knowledge sharing as using technology, establish objectives and strategy, prepare for change, define processes, and foster a KS culture.

**A. Using Technology:** At the present time there is no doubt that technology has become the main nerve of any project of participation and communication. Therefore, it is necessary to strengthen the foundations for building a technological base to spread the culture of cooperation and participation in any organization.

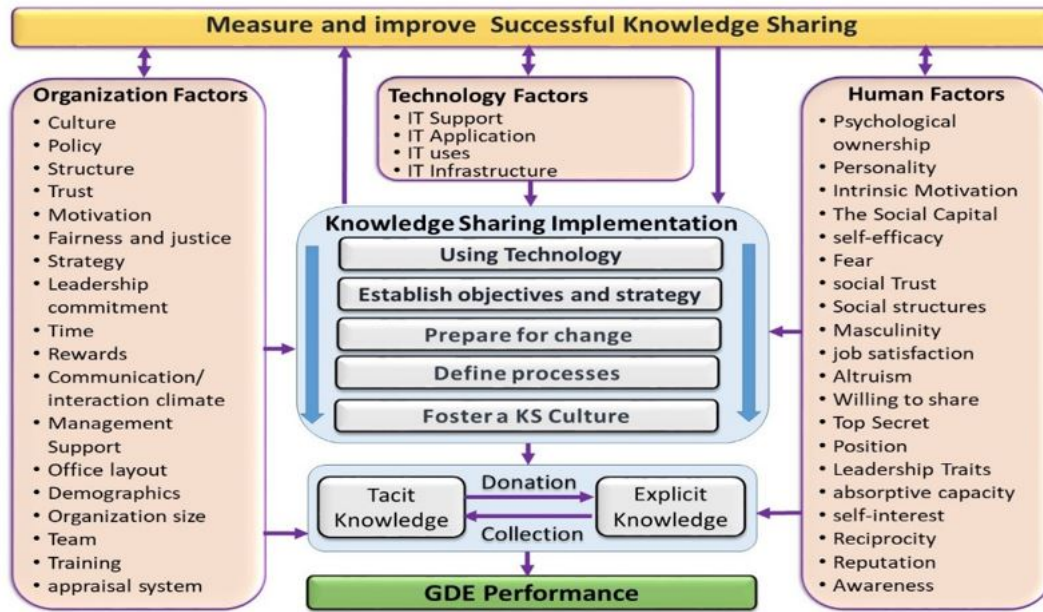


Fig. 3. knowledge sharing Model

**B. Establish objectives and strategy:** Successful organizations are the ones that define clear goals for all members of the organization to share knowledge and this success depends on implementing these goals, whether they are short-term, medium, or strategic. Determining these goals depends on identifying and addressing constraints and problems as well as monitoring and continuous evaluation.

**C. Prepare for change:** It is widely believed by some departments that knowledge sharing only needs to provide platforms and software applications in the organization. This belief is not true, employees need to prepare and develop intellectual, the organization needs to spread a culture of cooperation and encourage employees to share their knowledge, training in accessing platforms and sources of knowledge and many important things.

**D. Define processes:** Determining the processes that the organization needs to implement knowledge dissemination is crucial. The organization needs to identify experts and sources of knowledge, mechanisms for participation, supervisors to monitor and evaluate participation, remove duplicate processes, override routine and bureaucratic procedures as well as platform and technology management.

**E. Foster a KS culture:** Organizational culture is an important factor influencing the exchange and dissemination of knowledge. The organization needs to adopt new systems such as rewards and moral support that lead to a sense of well-being among employees and cooperation and voluntary sharing of knowledge.

Measuring and improving the successful sharing of knowledge is the most important stage to ensure continued successful and effective knowledge sharing. This measurement is made through continuous and smooth updates, as well as the system dedicated to disseminating knowledge. It should be easy to access, participate and communicate with the community outside the organization.

## 6. Conclusions

This study attempted to recombine the factors that affect knowledge sharing in the GDE-Babylon, Iraq. Senior management should reduce the effects of these challenges and increase the effectiveness of knowledge sharing to improve employee performance in GDE. Employees favour intrinsically-motivated incentives, such as colleagues' acknowledgement and respect, improved reputation, and the possibility of professional or personal development. While other employees consider that sharing their knowledge is stealing from them and investing from others. Senior administrators in GDE need serious reassessment to ideas non-cooperative and enhance functional confidence to reach a successful exchange of knowledge in GDE. Moreover, investing in information technology is an important step to build human capabilities by compensating for the shortfall that may occur due to the departure of those with expertise from GDE. The model presented by the study includes intelligent practical steps that can be considered as an action plan for implementing the cooperative method in GDE. Monitoring and evaluation should be continued



at all steps of the implementation of knowledge sharing in order to achieve improved performance in GDE.

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