The Role of Knowledge Management Processes in Enhancing the Quality of Banking Information Systems: An Applied Study in the Iraqi Islamic Banking Sector

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ABSTRACT
The study aimed to identify the role of knowledge management processes in enhancing banking information systems in Iraqi Islamic banks (Iraqi Islamic Bank for Investment and Development, National Islamic Bank, Al-Eliaaf Islamic Bank, Islamic Cooperation Bank for Investment, Al-Ataa Islamic Bank for Investment and Financing). The total number of employees in these banks was 2,300 across all branches. A random sample representing senior, middle, and executive management was selected, totaling 320 individuals. Various statistical methods were used to achieve the study objectives, relying on structural equation modeling using the SmartPLS3 software. The study reached several results, the most important of which was the statistically significant relationship. It was found that Islamic banks in Iraq have shown an acceptable level of attention to knowledge management processes. However, they still need to exert more effort in practicing knowledge generation, storage, and sharing to activate and enhance banking information systems. The study recommends that Islamic banks in Iraq provide continuous training and educational programs for employees to increase awareness of the importance of knowledge management and enhance effective practices in knowledge generation, storage, and sharing. Furthermore, the study suggests conducting future research by introducing other variables, such as financial technology and artificial intelligence, to enhance banking information systems.

INTRODUCTION
Knowledge management processes can be vital in enhancing the quality of banking information systems in Iraqi banks. When knowledge is effectively managed, the knowledge and expertise related to banking systems can be identified, documented, and shared among employees, which helps improve the quality of information systems in banks. Additionally, knowledge management processes can help enhance organizational learning and improve decision-making processes in banks. Banks can provide training and development for employees on effectively using banking systems and improving internal processes to maximize the benefits of banking systems. (Sajjad, 2023)

Knowledge management processes can also improve the quality of banking services and customer satisfaction. Banks can use knowledge and customer-related expertise to identify their needs and provide customized banking services according to their requirements. (Kosheleva et al., 2023)

Given the crucial role played by knowledge management processes in enhancing the quality of banking information systems and improving the quality of banking services, Iraqi banks should give significant attention to effectively implementing knowledge management processes and regularly updating their banking systems to meet customer requirements and achieve more success and sustainability in the market. (Adetayo et al., 2020)

Knowledge management processes involve collecting, organizing, distributing, and efficiently utilizing knowledge, which can positively impact the quality of banking information systems. Improving the quality of banking information systems can increase the efficiency of banking operations and reduce the risks of errors and fraud. A critical study in this field is conducted by researchers (Al-Quran et al., 2023) titled “An Empirical Study on Operating Banks in Jordan.” In this study, researchers found a positive relationship between knowledge management and the quality of banking information systems, indicating that implementing knowledge management practices can improve the quality of information systems.

On the other hand, some studies have indicated the absence of a positive relationship or a significant impact of knowledge management processes on the quality of banking information systems. For example, a survey by Siregar, T., & Nuryatno, M. (2023) found no direct effect of knowledge management on the quality of information systems in the banking services industry. However, knowledge management can help improve the quality of information systems by enhancing organizational learning and decision-making processes. Therefore, any institution operating in the banking services industry should focus on strengthening organizational learning and improving decision-making processes to enhance the quality of information systems.

Another study by Torabi, F., & El-Den (2017) indicated a weak and insignificant relationship between knowledge management and the quality of information systems in Iran’s banking services industry. Hence, institutions operating in this sector should work on strengthening
the relationship between knowledge management and the quality of information systems. Additionally, a study by Santhosh and Lawrence (2023) suggests that knowledge management has little impact on the quality of information systems in the banking services industry. Therefore, institutions in this sector should improve knowledge management and identify the factors that affect the quality of information systems.

These conflicting results highlight the need for further research and intellectual debate to establish the relationship between the variables under investigation, mainly when applied in the Iraqi context. Iraq requires such research due to its political and economic instability, particularly in the banking sector, which is still emerging and lagging compared to developed countries. Hence, the researchers embarked on the current study to explore the relationship between knowledge management processes and the quality of banking information systems in Islamic banks operating in Iraq. The research problem revolves around determining the role of knowledge management processes in enhancing the quality of banking information systems, and the following questions arise:

- What is the level of knowledge management practices in the researched banks?
- What is the quality of banking information systems in the researched banks?
- Is there a statistically significant relationship between knowledge management processes and banking information systems?

The Importance of Research

Research is one of the essential topics in management and banking sciences that contribute to the development of the Iraqi banking sector. The importance of the variables under investigation and their role in enhancing the effectiveness of banking operations and developing the economic sector is evident. The focus is on the quality of banking information systems to improve the reality of banking operations and protect their systems from breaches and risks associated with using information systems. On the other hand, it contributes to enhancing the quality of the decision-making process by providing information to operational and investment decision-makers in the researched banks.

Research Objectives

- Attempt to identify the level of knowledge management processes in the researched organization.
- Determine the level of activation and interest of the researched organization in banking information systems.
- Measure the statistical relationship between knowledge management processes and banking information systems.

METHODOLOGY

Based on the research methodology, its importance, and objectives, we can formulate the research plan and illustrate the relationship between the research variables as follows (Figure 1):

![Research Model](image)

**Independent Variable**

Knowledge management processes are represented by the three dimensions (knowledge generation x1, knowledge storage x2, knowledge sharing x3). (Al-Dmour, R., & Rababeh,2021)

**Dependent Variable**

Banking information systems are represented by the dimensions (information retrieval speed y1, system suitability y2, information security y3, user satisfaction y4) (Abualoush et al., 2018)

**Research Population and Sample**

The research population consists of employees in Iraqi Islamic banks, totaling 29 banks. A sample was taken from these banks, specifically from 5 banks: Iraqi Islamic Bank for Investment and Development, National Islamic Bank, Al-Ilaaf Islamic Bank, Islamic Cooperation Bank for Investment, and Al-Ataa Islamic Bank for Investment and Finance. These banks’ total number of employees is 2,300, spread across all branches. A random sample was selected, representing the top, middle, and executive management, with 320 employees, based on the equation (Steven et al., 2012),

\[ n = (N^2P (1-P))/[N-1*(d^2 + z^2)] + p (1-p) \]

**Data Collection Tools**

The researchers relied on literature and previous studies related to the variables of the current study. A questionnaire consisting of 28 items was designed and divided into the researched variables. The variable of knowledge management processes consists of 12

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items distributed across three dimensions (knowledge generation, knowledge storage, and knowledge sharing), with four items for each size. The variable of banking information systems consists of 16 items, composed of four sub-dimensions (information retrieval speed, system suitability, information security, user satisfaction), with four items for each sub-dimension.

**Statistical Analysis Methods for Data**

The researchers relied on a set of statistical methods (validity and reliability), mainly to test the suitability and quality of the measurement tool. Structural equation modeling was adopted using the statistical application SmartPLS 3 and path analysis.

**LITERATURE REVIEW**

**Knowledge Management Processes**

Many authors and researchers have discussed the concept of knowledge, including the organization's ability to deal with data and information and use them correctly to achieve goals (Abubakar et al., 2019). Knowledge management processes refer to interconnected activities and specific tasks defined by the organization to facilitate knowledge creation and utilization. It is a continuous and sustainable process of transforming knowledge into various forms, where knowledge management processes support the conversion of tacit knowledge into explicit knowledge (Alewine et al., 2016). Khaled et al. (2019) stated that knowledge management is the coordinated efforts of the organization to collect, classify, store, and prepare all types of knowledge related to the organization's work for sharing among employees, thus supporting effective decision-making.

**Importance of Knowledge Management Processes**

Researchers have addressed the importance of knowledge management processes, focusing on the following points (Torabi et al., 2017):

- We are enhancing the organizational knowledge power and contributing to achieving excellence through growth, survival, and continuity.
- They are essential processes in the functioning and sustainability of organizations, as they are involved in all organizational activities.
- We provide organizations with greater adaptability to the surrounding environment, focusing on knowledge generation, storage, and utilization.
- They are contributing to improving performance and achieving goals.
- We are providing the necessary support for organizations' fundamental and intellectual capabilities, thus enhancing resilience and knowledge enrichment.

**Dimensions of Knowledge Management Processes**

There are variations in researchers' opinions regarding a specific set of knowledge management processes. Some of them have identified the following dimensions: [Please provide exact dimensions or refer to the literature you want to be summarized]

**Knowledge Generation and Acquisition**

It refers to a set of activities carried out by organizations to discover and acquire knowledge from internal and external sources, as well as generate knowledge through research and exploration processes (Adetayo et al., 2020). This process requires identifying and diagnosing understanding, acquiring it, and then working on creating it according to the organization's tasks. Afterward, the necessary strategies for knowledge management are developed to ensure its continuous flow and attraction from internal and external sources (Siregar et al.; M., 2023).

**Knowledge Storage**

(Khaled et al., 2019) emphasized the importance of storing and preserving newly acquired knowledge for easy access and future use. Storage itself involves capturing knowledge, encoding it, and making copies. (Al-Dmour, R., & Rababeh, 2021) views the storage process as a way to preserve invaluable assets that cannot be bought with money but accumulate over time.

**Knowledge Sharing**

It is the process of disseminating knowledge, whether implicit or explicit, by organizations or individuals to other organizations and individuals. Knowledge sharing can be categorized into two types: intentional, which is deliberate and takes place through specified official channels, and unintentional, which occurs informally outside working hours among employees in their organizations. Knowledge sharing directly depends on organizational culture, managerial behavior, and communication rules (Sajad, 2023).

It is worth noting that some authors and researchers have added other knowledge management processes (knowledge organization, knowledge application, knowledge utilization, knowledge transformation, and knowledge protection). The research agrees with (Santhose & Lawrence, 2023) that knowledge management processes revolve around three dimensions (knowledge generation, knowledge storage, and knowledge sharing).

**Banking Information Systems**

Banking information systems are the cornerstone of banking operations, competing to provide diverse services in a rapidly changing and advanced technological environment. They focus on information and the services that banks offer their customers, aiming to achieve excellence for the banks and their operations (Nurdin, 2019). Adel (2015) defines banking information systems as activities that support decision-makers and managers with information related to all banking operations, facilitating decision-making processes and achieving the desired performance. Alewine et al. (2016) also state that banking information systems contain all the information about bank customers and their accounts. These systems help eliminate paper-based data, promote collaboration, and facilitate information access across different computer applications to achieve the desired goal.
Importance of Banking Information Systems

Banking information systems play a crucial and strategic role in building the competitive advantage of banks, directly relying on accurate information (Sajjad, 2023). Banking information systems serve as a customer attraction tool, as most customers prefer dealing with banks that provide excellent and advanced services. They also assist managers in making the right decisions based on timely and accurate data and information.

Based on the research above and studies, the importance of knowledge management processes in enhancing and activating banking information systems can be emphasized. The following hypotheses can be formulated:

H1: Knowledge management processes and banking information systems have a statistically significant relationship.

H2: There is a collectively statistically significant impact of knowledge management processes on banking information systems.

Hypothesis Testing

H1: Knowledge management processes and banking information systems have a statistically significant relationship. Table (1) shows the correlation test based on the Pearson coefficient.

The results of the above Table indicate the presence of a statistically significant positive relationship between all dimensions and variables of the study. Therefore, we accept the first hypothesis of the study (H1). After confirming the critical relationship between the study variables, we proceed to test the other research hypotheses, which aim to examine the impact and level of influence between the variables under investigation, as stated in the following hypotheses:

H2: Knowledge management processes have a statistically significant impact on the quality of banking information systems. This hypothesis branches into the following sub-hypotheses:

H2-1: The knowledge generation dimension has a statistically significant impact on the quality of banking information systems.

H2-2: The knowledge storage dimension has a statistically significant impact on the quality of banking information systems.

H2-3: The knowledge-sharing dimension has a statistically significant impact on the quality of banking information systems.

The first study model, as shown in Figure (2), illustrates the testing of the second central hypothesis (H2): the impact of the independent variable “knowledge management processes” on the dependent variable “quality of banking information systems,” as depicted in Figure (1) below.

Model Quality Measurement

To ensure the quality of the model, a set of steps must be taken. Firstly, we need to confirm the outer loading, which should be at least 0.70. All model items have levels above 0.70, indicating excellent saturation. To further ensure, we check for the absence of linear correlation using the Variance Inflation Factor (VIF), which should be at most 3 (some sources suggest not exceeding 5). All values are below 3, which falls within acceptable limits. We also verify the value of Cronbach’s Alpha, which appears excellent.
to be 0.846 for the variable “knowledge management processes” and 0.868 for the dimension of “quality of banking information systems.” These high values indicate a strong positive correlation and high-scale stability. Additionally, the value of Composite Reliability (C.R) reached 0.907 for the variable “knowledge management processes” and 0.910 for the variable “quality of banking information systems,” which are higher than the standard value of 0.70. Furthermore, the Average Variance Extracted (AVE) values for the variables “knowledge management processes” and “quality of banking information systems” are 0.765 and 0.718, respectively, both exceeding the standard weight of 0.50. The Standardized Root Mean Square Residual (SRMR) value is 0.068, which is less than 0.09 and falls within the criterion of good fit.

After confirming the quality and suitability of the study model, we will test the level of influence between the researched variables (knowledge management processes on the quality of banking information.

### Table 2: K. M. processes

<table>
<thead>
<tr>
<th>Latent Variables</th>
<th>Outer Loadings</th>
<th>VIF</th>
<th>Construct Reliability and Validity</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>x1</td>
<td>0.889</td>
<td>2.325</td>
<td>Cronbach’s Alpha 0.846</td>
<td></td>
</tr>
<tr>
<td>x2</td>
<td>0.818</td>
<td>1.721</td>
<td>C.R 0.907</td>
<td></td>
</tr>
<tr>
<td>x3</td>
<td>0.914</td>
<td>2.514</td>
<td>(AVE) 0.765</td>
<td></td>
</tr>
<tr>
<td>Banking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>systems.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y1</td>
<td>0.776</td>
<td>1.673</td>
<td>0.868</td>
<td></td>
</tr>
<tr>
<td>y2</td>
<td>0.900</td>
<td>2.908</td>
<td>0.910</td>
<td></td>
</tr>
<tr>
<td>y3</td>
<td>0.856</td>
<td>2.207</td>
<td>0.718</td>
<td></td>
</tr>
<tr>
<td>y4</td>
<td>0.852</td>
<td>2.248</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 3: First structural path analysis

<table>
<thead>
<tr>
<th>Path Coefficients</th>
<th>β</th>
<th>R²</th>
<th>(STDEV)</th>
<th>T</th>
<th>P Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge management processes -&gt; Banking information systems</td>
<td>0.825</td>
<td>0.681</td>
<td>0.016</td>
<td>52.667</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The Table above results indicate a statistically significant positive effect of knowledge management processes on the quality of banking information systems in the surveyed banks, with a coefficient of 0.825. This means that a one-unit change in the knowledge management processes variable will result in an 82.5% change in the quality of banking information systems, with a significance level of P=0.000, which is less than 1%. The determination coefficient (R²) is 0.681, indicating that the knowledge management processes variable explains 68% of the variation in the quality of banking information systems. Therefore, we can accept the second central hypothesis H2: Knowledge management processes have a significant effect on the quality of banking information systems.

After testing the main hypotheses of the study, it is necessary to try the sub-dimensions of knowledge management processes and their impact on the quality of banking information systems, according to the following hypotheses:

- **H2-1**: The knowledge generation dimension has a significant effect on the quality of banking information systems.
- **H2-2**: The knowledge storage dimension has a significant effect on the quality of banking information systems.
- **H2-3**: The knowledge-sharing dimension significantly affects the quality of banking information systems.

The second structural model will be used to test the above hypotheses, as shown in Figure (4), which aims to test the sub-dimensions of knowledge management processes on the quality of banking information systems. First, measuring model quality: To ensure the quality of the model, a series of steps should be taken. First, ensure that the outer loading saturations of the items are not less than 0.70. It is noted that all model items have levels above 0.70, which is excellent, as shown in Figure 4 above and Table 4 below.
(VIF), which should not exceed 3. While some sources also indicate that it should not exceed 5, we observe that all values do not exceed 3, which is within acceptable limits. We also confirm the value of Cronbach’s Alpha, which ranges from 0.822 to 0.868 for all dimensions. These are high values indicating good correlation and high-scale stability. In addition, the value of C.R. ranges from 0.882 to 0.901, which is higher than the standard value of 0.70. Furthermore, the value of AVE is 0.765, and the variable of the quality of banking information systems ranges from 0.652 to 0.718. All discounts are more significant than the standard value of 0.50. The value of SRMR is 0.064, which is less than 0.09 and falls within the criterion of good fit.

Table 4: Results of Measuring the Quality of the Second Study Model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Latent Variables</th>
<th>Outer loading</th>
<th>VIF</th>
<th>Cronbach’s Alpha</th>
<th>C.R</th>
<th>(AVE)</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generating knowledge</td>
<td>X1</td>
<td>0.801</td>
<td>1.739</td>
<td>0.834</td>
<td>0.889</td>
<td>0.668</td>
<td>0.064</td>
</tr>
<tr>
<td></td>
<td>X2</td>
<td>0.853</td>
<td>2.224</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X3</td>
<td>0.833</td>
<td>2.195</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X4</td>
<td>0.781</td>
<td>1.783</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Store knowledge</td>
<td>X5</td>
<td>0.869</td>
<td>2.570</td>
<td>0.853</td>
<td>0.901</td>
<td>0.697</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X6</td>
<td>0.908</td>
<td>2.159</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X7</td>
<td>0.833</td>
<td>2.049</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X8</td>
<td>0.717</td>
<td>1.465</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Share knowledge</td>
<td>X9</td>
<td>0.778</td>
<td>1.630</td>
<td>0.822</td>
<td>0.882</td>
<td>0.652</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X10</td>
<td>0.847</td>
<td>1.950</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>X11</td>
<td>0.832</td>
<td>1.889</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X12</td>
<td>0.772</td>
<td>1.566</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banking information systems.</td>
<td>Y1</td>
<td>0.776</td>
<td>1.673</td>
<td>0.868</td>
<td>0.910</td>
<td>0.718</td>
<td></td>
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<td></td>
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</table>

After confirming the suitability and quality of the study model, we will test the structural equation modeling to test the sub-hypotheses. As shown in Table (5) and Figure (5) below, the second study model aims to test the impact of the sub-dimensions of knowledge management processes on the quality of banking information systems.
databases, content management systems, and internal communication tools can be used to write and organize critical expertise for the bank and facilitate access when needed.

3. They encourage collaboration and knowledge sharing among employees by creating a work environment that promotes communication and knowledge exchange. Interactive sessions, opportunities for joint learning, and regular exchange of ideas and experiences can be organized between different teams and departments.

4. Islamic banks should invest significantly in advanced information technology that supports knowledge management processes. Content management systems, internal social networks, tools for analysis, and machine learning can be used to enhance knowledge generation and sharing processes and facilitate access to knowledge.

5. Senior leadership should be vital in promoting and implementing a knowledge management culture. The administration should be committed to providing necessary resources, support, and guidance to implement and enhance knowledge management initiatives as part of the bank’s strategy.

LIMITATIONS
The current study relied on a sample of employees from Iraqi Islamic banks, with 320 participants. This means that the results of the present study cannot be generalized to the entire Iraqi banking sector. Additionally, the present study focused on only two variables: knowledge management processes and banking information systems. It is possible to introduce other variables, such as the role of employees in knowledge management processes and the impact of external factors on knowledge management outcomes.
as the role of financial technology in enhancing banking performance, or another variable as a mediator, such as organizational learning or artificial intelligence, to improve the relationship between the studied variables.

REFERENCE

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