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The Effect of Knowledge Management on Banks Performance Using the Balanced Scorecard Perspectives at The Banking System in The Northern State

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Abstract:

The problem of the study focuses on weakness of indicators in (BSP) at the (BS) in the Northern State perform to decrease (BP) level, The study aims to measure the effect of (KM) on (BP) through the use of (BSP) at the (BS). One Main hypothesis were developed and a questionnaire was designed. After data collection and analysis from the respondents, the study reached up to a significant statistical effect of (KM) on (BP). The study recommended Banking System at the Northern State have to pay more attention to (KM) Practices by holding training courses in how to exploit the knowledge available within the branches banks.

Key words: Knowledge Management (KM); Banks Performance (BP); Balanced Scorecard Perspectives (BSP); The Banking System (BS) in The Northern State.

JEL Classification Codes: D83 ,O32, E58,H11.

Introduction

Banks are viewing knowledge as the most valuable & strategic resource; they are realizing that to remain competitive they must explicitly manage this resource. According to that, bank has to enhance its Knowledge Management practices (Knowledge Creation, Knowledge Sharing, Knowledge Storage, Knowledge Distributing, Knowledge Protecting and Knowledge Application) and any gap in these practices will affect the bank performance and will have an impact on its productivity, profitability, developments and improvements. Therefore, knowledge management can be considered as the most important function on bank performance. Hence, this study came to measure the effect of Knowledge Management on Banks Performance using the Balanced Scorecard Perspectives at The Banking System in The Northern State.

Study Problem and Questions

The problem of the study focuses on weakness of indicators (Financial Performance, Customers, Internal Process and Learning) in (BSM) at the Banking System in the Northern State perform to decrease (BP) level, which refer to unawareness of implementing effective managerial systems like (kM). Hence, the main question of this study is What is the effect of (KM) (Creation, Sharing, Storage, Distributing, Protecting and Application) on Banks Performance using the Balanced Scorecard Perspectives in the Banking System? Divided into the following sub questions:

1. What is the effect of Knowledge Management Practices on Banks Performance using Financial Perspective of the Balanced Scorecard?
2. What is the effect of Knowledge Management Practices on Banks Performance using Customers Perspective of the Balanced Scorecard?
3. What is the effect of Knowledge Management Practices on Banks Performance using Internal Process Perspective of the Balance Scorecard?
4. What is the effect of Knowledge Management Practices on Banks Performance using Learning Perspective of the Balanced Scorecard?

Study Hypotheses

The study is trying to test the validity of the main Hypotheses of this study: There is no statistically significant effect of Knowledge Management (Creation, Sharing, Storage, Distributing, Protecting and Application) on Banks Performance using the Balanced Scorecard Perspectives in the Banking System at level ($\alpha \leq 0.05$). Divided into the following sub Hypotheses:

1. There is no statistically significant effect of Knowledge Management Practices on Banks Performance using Financial Perspective of the Balanced Scorecard Perspectives in the Banking System at level ($\alpha \leq 0.05$).

There is no statistically significant effect of Knowledge MANAGEMENT Practices on Banks Performance using Customers Perspective of the Balanced Scorecard Perspectives in the Banking System at level ($\alpha \leq 0.05$).

2. There is no statistically significant effect of Knowledge Management Practices on Banks Performance using Internal Process Perspective of the Balanced Scorecard Perspectives in the Banking System at level ($\alpha \leq 0.05$).
3. There is no statistically significant effect of Knowledge Management Practices on Banks Performance using Learning Perspective of the Balanced Scorecard Perspectives in the Banking System at level ($\alpha \leq 0.05$).

Study Objectives

This study aims to emphases on Knowledge Management (Creation, Sharing, Storage, Distributing, Protecting and Application) and the Balanced Scorecard Perspectives (Financial, Customers, Internal Process and Learning) that will help the Banking System in the Northern State to improve their Performance. It is aims to achieve the following objectives:

1. Measuring the effect of Knowledge Management Practices on Banks Performance using the Balanced Scorecard Perspectives.

2. Measuring the effect of Knowledge Management Practices on Banks Performance using Financial Perspective of the Balanced Scorecard.
3. Determining the effect of Knowledge Management Practices on Banks Performance using Customers Perspective of the Balanced Scorecard.
4. Determining the effect of Knowledge Management Practices on Banks Performance using Internal Process Perspective of the Balance Scorecard.
5. Defining the effect of Knowledge Management Practices on Banks Performance using Learning Perspective of the Balanced Scorecard.

Importance of the Study

The study derived its importance from two sides:

1. Theoretical importance: The importance of this study contribution to the existing knowledge related to the relationships between study variables, Providing important insight and useful guidance for Banks to streamline their Knowledge Management practices internally with employees and Making recommendations to use the Balanced Scorecard to improve Performance.
2. Applied importance: The results of this study provided empirical data for managers in banking system considering the effect of Knowledge Management Practices on Banks Performance using the Balanced Scorecard Perspectives, therefore a better context for the banking system and more information for the decision makers that help them define the bank's priorities regarding knowledge processes to improve performance.

Study Method

This study followed descriptive and analytical method, also the researcher used historical method.

Resource information of study

The study depend on primary sources which represent on experts, respondents and used a Questionnaire & Interview as tools to collect information. Furthermore, secondary sources include books, scientific research, Studies, Magazines, Conferences related to subject of the study and internet sites.

Study Limitations

The limitations for this study are summarized as follows:

1. Place Limitation: The Banking System in the Northern State.
2. Human limitation: This study applied to Employees who work at the Banking System in The Northern State in two managerial levels (Leadership and employees) and their number (150).
3. Time limits: This study has been applied during the period 2015 to 2022.

Study Variables

This study consists of two variables as follows:

1. Independent Variable: Knowledge Management Practices (Creation, Sharing, Storage, Distributing, Protecting and Application).
2. Dependent Variable: Banks Performance using the Balanced Scorecard Perspectives (Financial, Customers, Internal Process and Learning).

Study Model

Figure 1 shows the study model which reflects the Knowledge Management Practices as an independent variable and Banks Performance using the Balanced Scorecard Perspectives as the dependent variable.

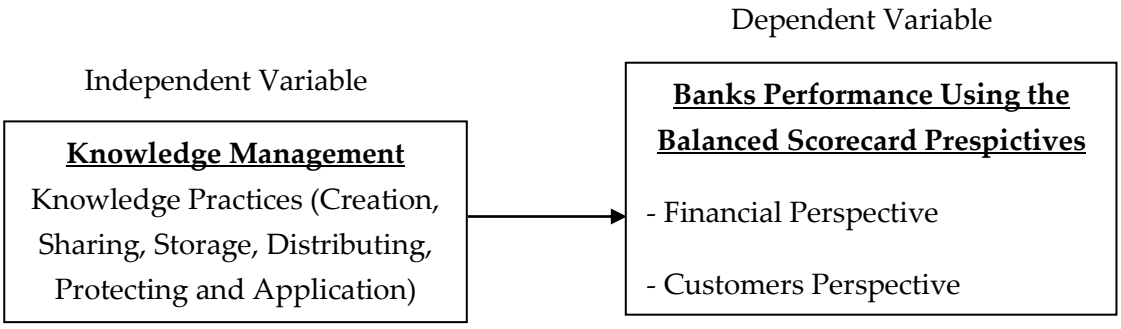

Figure 1: Study Model

Previous Studies

A study by (Abdelhameed & Ezielden, 2022) aims to Examining The Role of (KM) on Competitive Performance in The (BS) at Dongola Locality. In this study, (KM) were divided to: (Infrastructure and Operations). The result showed that there a significant impact of (KM) on Competitive Performance. The study recommended activate some practicing that enable to achieving Competitive Performance in banks under study.

A study by (Salim, 2021) aims to Examining The impact of (KM) on Intellectual Capital & Strategic Planning in the (BS) at the Northern State. In this study, (KM) were divided to: (Creation, Sharing, Storage, Distributing, Protecting and Application). The result showed that there a significant impact of (KM) on Intellectual Capital & Strategic Planning. The study recommended: The need to establish organizational units at the branches of banks concerning with creating and innovation to encourage loyalty and adherence to the state.

A study by (Abdelraheem, 2019) aims to investigate the role of using BSc on increasing performance efficiency at The Communications Companies in The Northern State. This study uses the (BSP) (Financial, Customers, Internal Process and Learning). The result showed that there a significant impact of (BSP) (Financial, Customers, Internal Process and Learning) on increasing performance efficiency. The researcher recommended Top management should adopt a model of Balanced Scorecard by full integration with four Perspectives to help the Companies increase performance efficiency.

A study by (Al-Gazi, 2014) aims to measure the effect of (KM) on Organizational Performance through the use of (BSP) in Jordanian Private Hospitals in the City of

Amman. In this study, (KM) practices were divided to: (Creation, Sharing, Storage and Application). The result showed that there a significant impact of (KM) practices on all (BSP) (financial, customer, internal process and learning). The researcher recommended Top management in Jordanian Private Hospitals in the City of Amman should apply rotation among managers to help them increase their scope of knowledge and learn.

A study by (Almhameed & Slehat, 2013) aims to measure the impact of the (KM) Practices on Performance using a (BSP) in small and medium sized industrial companies in garment sector. In this study, (KM) practices were divided to: (creation and acquisition, Storage, documentation and retrieval, Sharing and application. The result showed that there is a significant impact of (KM) practices on all (BSP) (financial, customer, internal process, learning, employees and environment). The study recommended that industrial companies have to provide financial and moral support which is necessary for (KM) practices by using the (BSc) and make training sessions on how to exploit the knowledge and develop it within companies.

Theoretical Framework

Knowledge Management

(Li et al., 2012) defined Knowledge Management is the entire set of practices and activities which are involved in manipulating the stocks and flows of knowledge in the organization, starting from how knowledge is created and continuing to how it is harvested, stored, shared and reused in new and related situations. (Al-Aama, 2014) mentioned that the Knowledge management has a lot of benefits; it provides employees in organizations with the knowledge they need to do their work effectively, it can empower innovation and drive competitive advantage, if implemented effectively, it can enhance organizations' competence and raise organizations' service quality.

Balanced Scorecard (BSC)

(Abran & Buglione, 2003) defined the (BSc) is a logical framework for describing, implementing and managing strategy at all levels of the organization by linking

through logical structure, objectives, initiative and measurement of an organization strategy. The (BSc) measures financial, customer, internal business process as well as organization learning. The (BSc) provides several benefits to organizations. It provide a holistic view of what is happening inside and outside of organizations by allowing each participant to see how individuals could contribute to the overall mission, it helps align key performance measures with strategy, facilitates communication and understanding overall goal for organization, and it helps everyone in the organization to understand the cause & effect relationships of the things they do, the mission, vision, and strategy of the organization, the long term effects of actions and everyone's contributions. It offers strategic feedback and information needed to make adjustments to strategies and activities as necessary (Huang, 2007).

Organizational Performance and the use of Balanced Scorecard

(McGuire, 2006) mentioned that the Organizational Performance refers to what the organization does to improve efficiencies, how the organization plans to excel against the competition and how the organization plans for the future; to find out the gaps of performance occurrence. In (2014) Al-Gazi mentioned that the Balanced Scorecard is a performance measurement system, a strategic management system, and a communication tool, which is derived from vision and strategy, and reflecting the most important aspects of the organization, it reflects short, medium and long term objectives, financial and non-financial measures, objective and subjective measures, lagging and leading indicators and external and internal performance perspectives. The Balanced Scorecard is performance measurement system that is based on four linked perspectives (financial, customer, internal process, and learning) which are derived from the organization's vision, strategy, and objectives (Abdelraheem, 2019).

The effect of Knowledge Management on Balanced Scorecard

Knowledge Management reflect overall improvement in outcomes of functional strategies of a foundation such as the improvement in customer response time,

improvement in human capital contributions, increase in ratio of new products, and increase in return on net assets. Therefore it was considered appropriate to label this factor as strategic improvement (Jayasingam et al., 2012). Knowledge management clearly fits the framework of balanced scorecard; where the outputs of knowledge management affect the customer and the finance, while learning and growth is fostered by knowledge management activities and by applying learning and growth perspective, bank has to identify the internal process as shown in figure (2) (Cabrita et al., 2010).

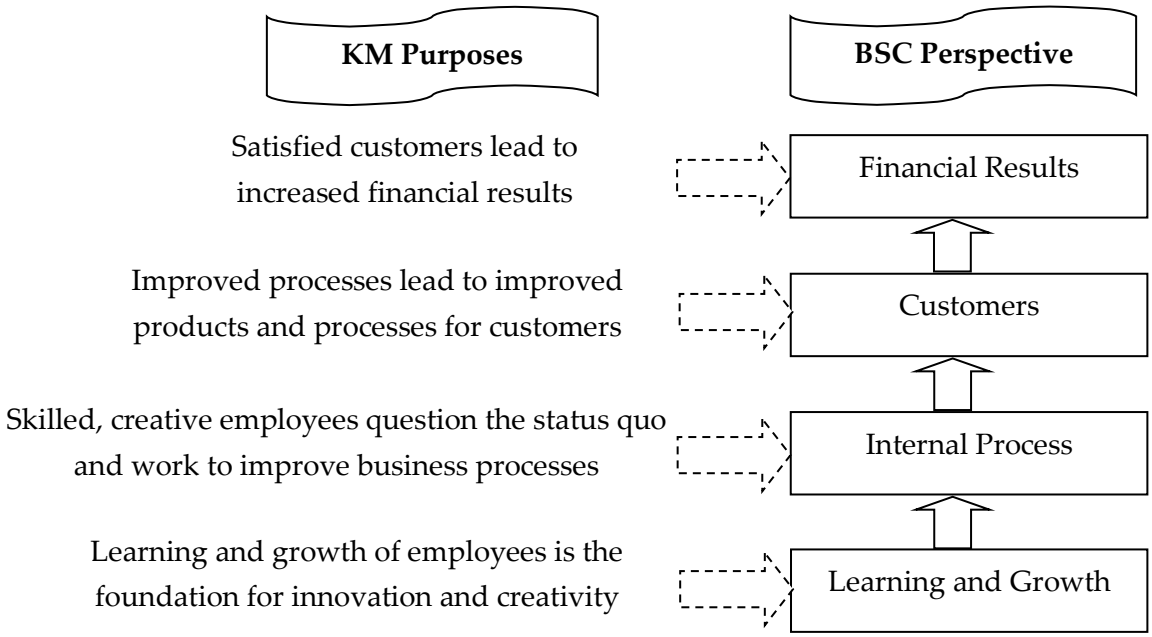

Figure 2: Linking KM processes to the Balanced Scorecard (Cabrita et al., 2010)

Knoledge Management and Balanced Scorecard at the Banking System in the Northern State

In (2022), Salim mentioned Knowledge management can be used to enable banks to have more effective decision making processes and to enable banks to create new knowledge and to apply this knowledge to generate more innovations in bank products, strategy, and processes. It can be also used to enable bank to have greater and long term returns. And added, Balanced scorecard is a management strategy that enables banks to translate the vision and strategy into actions; it focuses on internal

business processes and external outcomes to continually improve banks performance and results.

Presentation ,Analysis and discussion of questionnaire data

The Study Population and Sample

The population of the study consist of (13) branch bank located in Dongola (Appendix A). The researcher chooses a sample consisting of (150) employees who work in two jobs classifications (Managers and Employees). After distributing (150) questionnaires of the study sample, a total of (150) answered questionnaires were retrieved, Therefore, (150) answered questionnaires were valid for the study (response rate was 100%).

The Study Tool

After conducting a thorough review of the literature pertaining to study variables, the researcher formulated the questionnaire instrument for this study. The questionnaire instrumental sections as follows:

1. Section One: Demographic Variables. The demographic information was collected with closed-ended questions, through (5) factors (Age; Qualification; Specialization; Professional Experience and Training Course).
2. Section Two: Knowledge Management: This section measured the (KM) through (6) Practices (Creation, Sharing, Storage, Distributing, Protecting and Application); there are (6) items. All (6) items were measured on a Likert-type (5) scale.
3. Section three: Banks Performance: This section measured (BP) using the (BSP) through (4) perspectives (Financial, Customers, Internal Process and Learning); there are (4) items. All (4) items were measured on a Likert-type (5) scale.

Statistical Tests

The data collected from the responses of the study questionnaire were used through Statistical Package for Social Sciences (SPSS Version 26) for analysis and conclusions. Finally, the researcher used suitable statistical methods that consist of (Cronbach Alpha reliability, Skewness Test, Percentage and Frequency of distribution, Arithmetic Mean

and Standard Deviation, One Sample T Test, Correlation Coefficient and Regression Model)

Validity and Reliability

Validity

To test the questionnaire for clarity and to provide a coherent research questionnaire, a review that covers all the research constructs was thoroughly performed by academic reviewers from Dongola University and Experts work at The (BS) specialized in Business Administration and Accounting. Some items were added, while others were dropped based on their valuable recommendations. Some others were reformulated to become more accurate to enhance the research instrument. The academic reviewers and experts were (3) and the overall percentage of respond was (100%).

Reliability

Cronbach's alpha was used to determine the internal reliability of the elements comprising the four constructs as suggested by Gregory (2004). Reliability should be at a minimum acceptable level of ($\alpha \geq 0.60$) to indicate adequate convergence or internal consistency (Sekaran & Bougie, 2010). Pointed out that the overall Cronbach Alpha (α) = (0.900). Whereas the High level of Cronbach Alpha (α) related to Knowledge Management equaled (0.831). The lowest level of Cronbach Alpha (α) related to Banks Performance equaled (0.815). These results are within the acceptable level as suggested by (Sekaran & Bougie, 2010). The results are shown in Table (1).

Table (1): Reliability of Study Variables

#	Variable	No. of items	Cronbach's alpha value
1	Knowledge Management	6	0.831
2	Banks Performance	4	0.815
3	Questionnaire Overall	10	0.900

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

Analysis Results & Hypotheses Testing

Characteristics of Study Sample

Table (2) show the demographic variables of the study sample (Age; Qualification; Specialization; Professional Experience and Training Course**).**

Table (2): Descriptive of the demographic variables of the study sample

Variables	Categorization	Frequency	Percent
Age	From 20 – Less than 30 Years	41	27.3%
	From 30 – Less than 40 Years	60	40%
	From 40 – Less than 50 Years	41	27.3%
	50 Years or greater	8	5.4%
Qualification	High School	21	14%
	Graduate	97	64.7%
	Postgraduate	32	21.3%
Scientific Specialization	Business Administration	22	14.7%
	Accounting	55	36.7%
	Economics	38	25.3%
	Others	35	23.3%
Professional Experience	Less than 5 Years	46	30.7%
	From 5 – Less than 10 Years	47	31.3%
	From 10 – Less than 15 Years	26	17.3%
	15 Years or greater	31	20.7%
Training Courses	Internal	81	54%
	Internal & External	56	37.3%
	Others	13	8.7

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

Table (2) shows that the (40%) of the sample range aged between 30 – Less than 40 Years, (27.3%) of the sample range aged between 20 – Less than 30 Years and 40 – Less than 50 Years respectively, Finally, (5.4%) of the sample range aged 50 Years or greater. For the Qualification, the results show that (64.7%) from the study sample were graduate, (21.3%) from the study sample were postgraduate, finally, (14%) from the study sample were high school graduate. For Scientific Specialization, the results show that (36.7%) of the responses, majored in Accounting, (25.2%) of the responses, majored in Economics, (23.3%) of the responses, in Others Scientific Specialization, finally, (14.7%) of the responses, majored in Business Administration. From the professional experience variable, the results show that (31.3%) of the sample range have experience between 5 – Less than 10 Years, (30.7%) of the sample range have experience Less than 5 Years, (20.7%) of the sample range have experience 15 Years or more. Finally, (17.3%) of the sample range have experience between 10 – Less than 15 Years. For training courses, the results show that (54%) of the responses, have training courses internal, (37.3%) of

the responses, have training courses internal and external. Finally, (8.7%) of the responses, doesn't have any training courses yet.

Descriptive Analysis of Study Variables

Knowledge Management

Table (3): Phrases & dimensions of Knowledge Management variable

#	Phrase	Dimension
1	Bank management encourages employees to create innovative ideas	Creation
2	The bank has flexible managerial system for facilitate sharing knowledge between employees	Sharing
3	The bank has effective technological infrastructure for storing knowledge	Storage
4	Our bank depends upon team work style for achieving knowledge distributing	Distributing
5	Our bank management has ability to protect the necessary knowledge for its primary operations	Protecting
6	knowledge Application in our bank is good	Application

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

The researcher used arithmetic mean, standard deviation, one sample t-test, item importance level as shown in Table (4). The table (4) shows the importance level of (KM) dimensions, where the arithmetic means for dimensions range between (3.91 – 4.05) compared with general arithmetic mean amount of (3.99). We observed that the highest mean was for the (Knowledge Application) with arithmetic mean (4.05), standard deviation (0.801). The lowest arithmetic mean was for the (Knowledge Creation) with score of (3.91) and standard deviation (0.874). in general, it appears that the importance level of (KM) in the (BS) from the study viewpoint was high.

Table (4): Descriptive analysis of Knowledge Management dimensions

#	Knowledge Management	Mean	StD	t-Value Calculate	Sig	Item importance	Importance level
1	Knowledge Creation	3.91	0.874	12.795	0.000	6	High
2	Knowledge Sharing	3.97	0.851	14.009	0.000	4	High
3	Knowledge Storage	4.05	0.805	15.915	0.000	2	High
4	Knowledge Distributing	3.97	0.843	14.141	0.000	3	High
5	Knowledge Protecting	3.96	0.881	13.339	0.000	5	High
6	Knowledge Application	4.05	0.801	16.108	0.000	1	High
General Arithmetic mean and standard deviation		3.99	0.678	17.819	0.000	-	High
t- Value Tabulate at level ($\alpha \leq 0.05$) (1.645)							
t- Value Tabulate was calculated based on Assumption mean to item that (3)							

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

Banks Performance Using Balanced Scorecard Perspectives

Table (5): Phrases & dimensions of Banks Performance (Balanced Scorecard) variable

#	Phrase	Dimension
1	Growth of bank profitability rates	Financial
2	High response speed for customers needs	Customers
3	Bank management seeks to attract banking deposits	Internal Process
4	Ability of learning in our bank represents competitive advantage key	Learning

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

The researcher used arithmetic mean, standard deviation, one sample t-test, item importance level as shown in Table (6).

Table (6): Descriptive analysis of Banks Performance dimensions

#	Banks Performance	Mean	StD	t-Value Calculate	Sig	Item importance	Imp. level
1	Financial Perspective	4.11	0.815	16.722	0.000	3	High
2	Customers Perspective	4.17	0.789	18.102	0.000	2	High
3	Internal Process Perspective	4.18	0.760	19.007	0.000	1	High
4	Learning Perspective	3.98	0.930	12.902	0.000	4	High
General Arithmetic mean and standard deviation		4.11	0.663	20.514	0.000	-	High
t- Value Tabulate at level ($\alpha \leq 0.05$) (1.645)							
t- Value Tabulate was calculated based on Assumption mean to item that (3)							

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

The table (6) shows the importance level of Banks Performance dimensions, where the arithmetic means for dimensions range between (3.98 – 4.18) compared with general arithmetic mean amount of (4.11). We observed that the highest mean was for the (Internal Process Perspective) with arithmetic mean (4.18), standard deviation (0.760). The lowest arithmetic mean was for the (Learning Perspective) with average (3.98) and standard deviation (0.930). This indicates that Banking System is not emphasizing on the Learning Perspective in enhancing the Banks Performance. Also, in general, it appears that the importance level of Banks Performance using Balanced Scorecard Perspectives in the Banking System from the study viewpoint was high.

Adequacy Analysis of the data to test the Study Hypotheses

Before testing the hypotheses of the study, the researcher conducted some tests in order to ensure the adequacy of the data for regression analysis, it was confirmed that there was no high correlation between the independent variables Multicollinearity using the Variance Inflation Factor (VIF) and test Tolerance for each variable of the study variables taking into account the Variance Inflation Factor not to exceed the allowable value of (10). And that the Tolerance value greater than (0.05). Were also ensure that the data follow the normal distribution calculates the skewness coefficient, as the data follow a normal distribution if the value of skewness coefficient is less than (±1). Table (7) shows the results of these tests.

Table (7): Results of Variance Inflation Factor, Tolerance and Skewness coefficient

#	Independent Variables	VIF	Tolerance	Skewness	Skewness Error
1	Knowledge Creation	2.017	0.496	-0.319	+0.198
2	Knowledge Sharing	2.596	0.385	-0.744	+0.198
3	Knowledge Storage	2.676	0.374	-0.788	+0.198
4	Knowledge Distributing	2.996	0.334	-0.494	+0.198
5	Knowledge Protecting	2.178	0.459	-0.815	+0.198
6	Knowledge Application	2.053	0.487	-0.653	+0.198

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

It is evident from the results listed in Table (7) that there is no Multicollinearity between the independent variables and the values of Variance Inflation Factor of the dimensions are (2.017; 2.596; 2.676; 2.996; 2.178; 2.053), respectively, are less than (10). We can also see that the values of Tolerance ranged between (0.334 - 0.496) which is greater than (0.05). This is an indication that there is no Multicollinearity between the independent variables. To make sure that the data follow a normal distribution the researcher calculated the Skewness coefficient where the values were less than (1).

Study Hypotheses Testing

To test main hypothesis and sub hypotheses of the study, the researcher uses the multiple regression analysis to test the (KM) on (BP) in the Banking System.

Main Hypothesis: There is no statistically significant effect of (KM) (Creation, Sharing, Storage, Distributing, Protecting and Application) on Banks Performance using the Balanced Scorecard Perspectives in the Banking System at level ($\alpha \leq 0.05$).

Table (8) shows that Knowledge Management (Creation and Application) has a significant effect on Banks Performance using the Balanced Scorecard Perspectives in the Banking System. The regression model showed a medium degree of fit, as reflected by (R) and (R^2) value (0.669), (0.447), which asserted that (0.447) of the explained variation in Banks Performance in the Banking System can be accounted by Knowledge Management (Creation and Application). On the other hand, Table (8) for the data set indicated the slope value of (0.238) and (0.303) for the regression line. This suggested that for a one unit increase in Knowledge Management (Creation and Application) the respective Banking System can significantly predict a (0.238) and (0.303) increase in Banks Performance. Also table (8) shows that the analysis of variance of the fitted regression equation is significant with F value of (19.258). This is an indication that the model is a good one. In fact this supports the main hypothesis of the study. There is a statistically significant effect of (KM) (Creation and Application) on Banks Performance using the Balanced Scorecard Perspectives in the Banking System at level ($\alpha \leq 0.05$).

Table (8): Multiple regression analysis to test the main hypothesis of the study

Independent Variables	(B)	T-Value Calculate	Sig*	(DF)	(R)	(R^2)	F-Value Calculate	Sig*
Constant	1.552	6.124	0.000	6	0.669	0.447	19.258	0.000
Creation	0.238	3.554	0.001					
Sharing	-0.117	-1.497	0.137	143				
Storage	0.104	1.244	0.215					
Distributing	-0.003	-0.035	0.972					
Protecting	0.114	1.651	0.101	149				
Application	0.303	4.115	0.000					
* the impact significant at level ($\alpha \leq 0.05$)								
$Y_1 = 1.552 + 0.238\ x_{11} - 0.117\ x_{12} + 0.104\ x_{13} - 0.003\ x_{14} + 0.114\ x_{15} + 0.303\ x_{16}$								

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

Sub hypothesis one There is no statistically significant effect of (KM) Practices on (BP) using Financial Perspective of the (BSP) in the Banking System at level ($\alpha \leq 0.05$).

Table (9): Multiple regression analysis to test the sub hypothesis one of the study

Independent Variables	(B)	T-Value Calculate	Sig*	(DF)	(R)	(R^2)	F-Value Calculate	Sig*
Constant	1.588	4.663	0.000	6	0.584	0.341	12.327	0.000
Creation	0.344	3.827	0.000					
Sharing	-0.181	-1.723	0.087	143				
Storage	-0.068	-0.611	0.549					
Distributing	0.022	0.194	0.846					
Protecting	0.149	1.606	0.111	149				
Application	0.368	3.719	0.000					
* the impact significant at level ($\alpha \leq 0.05$)								
$Y_{11} = 1.588 + 0.344\ x_{11} - 0.181\ x_{12} - 0.068\ x_{13} + 0.022\ x_{14} + 0.149\ x_{15} + 0.368\ x_{16}$								

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

Table (9) shows that Knowledge Management (Creation and Application) has a significant effect on Banks Performance using Financial Perspective of the Balanced Scorecard in the Banking System. The regression model showed a medium degree of fit, as reflected by (R) and (R^2) value (0.584), (0.341), which asserted that (0.341) of the explained variation in Banks Performance (Financial Performance) in the Banking System can be accounted by Knowledge Management (Creation and Application). On the other hand, Table (9) for the executive data set indicated the slope value of (0.344) and (0.368) for the regression line. This suggested that for a one unit increase in Knowledge Management (Creation and Application) the respective Banking System can significantly predict a (0.344) and (0.368) increase in Banks Performance (Financial Performance). Also table (9) shows that the analysis of variance of the fitted regression equation is significant with F value of (12.327). This is an indication that the model is a good one. In fact this supports the sub hypothesis one of the study.

Sub hypothesis two There is no statistically significant effect of Knowledge Management Practices on Banks Performance using Customers Perspective of the Balanced Scorecard Perspectives in the Banking System at level ($\alpha \leq 0.05$).

Table (10): Multiple regression analysis to test the sub hypothesis two of the study

Independent Variables	(B)	T-Value Calculate	Sig*	(DF)	(R)	(R^2)	F-Value Calculate	Sig*
Constant	1.499	4.509	0.000	6	0.574	0.329	11.694	0.000
Creation	0.213	2.425	0.017					
Sharing	-0.001	-0.009	0.993	143				
Storage	0.241	2.195	0.030					
Distributing	0.039	0.353	0.725					
Protecting	0.020	0.222	0.825	149				
Application	0.155	1.600	0.112					
* the impact significant at level ($\alpha \leq 0.05$)								
$Y_{12} = 1.499 + 0.213\ x_{11} - 0.001\ x_{12} + 0.241\ x_{13} + 0.039\ x_{14} + 0.020\ x_{15} + 0.155\ x_{16}$								

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

Table (10) shows that Knowledge Management (Creation and Storage) has a significant effect on Banks Performance using Customers Perspective of the Balanced Scorecard in the Banking System. The regression model showed a medium degree of fit, as reflected by (R) and (R^2) value (0.574), (0.329), which asserted that (0.329) of the explained variation in Banks Performance (Customers Performance) in the Banking System can be accounted by Knowledge Management (Creation and Storage). On the other hand, Table (10) for the executive data set indicated the slope value of (0.213) and (0.241) for the regression line. This suggested that for a one unit increase in Knowledge Management (Creation and Storage) the respective Banking System can significantly predict a (0.213) and (0.241) increase in Banks Performance (Customers Performance). Also table (10) shows that the analysis of variance of the fitted regression equation is significant with F value of (11.694). This is an indication that the model is a good one. In fact this supports the sub hypothesis two of the study.

Sub hypothesis three: There is no statistically significant effect of Knowledge Management Practices on Banks Performance using Internal Process Perspective of the Balanced Scorecard in the Banking System.

Table (11): Multiple regression analysis to test the sub hypothesis three of the study

Independent Variables	(B)	T-Value Calculate	Sig*	(DF)	(R)	(R^2)	F-Value Calculate	Sig*
Constant	0.925	2.642	0.010	6	0.605	0.336	13.744	0.000
Creation	0.130	1.393	0.166					
Sharing	0.048	0.446	0.656	143				
Storage	0.237	2.034	0.044					
Distributing	0.052	0.438	0.662					
Protecting	0.086	0.901	0.369	149				
Application	0.229	2.232	0.027					
* the impact significant at level ($\alpha \leq 0.05$)								
$Y_{13} = 0.925 + 0.130\ x_{11} + 0.48\ x_{12} + 0.237\ x_{13} + 0.052\ x_{14} + 0.086\ x_{15} + 0.229\ x_{16}$								

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

Table (11) shows that Knowledge Management (Storage and Application) has a significant effect on Banks Performance using Internal Process Perspective of the Balanced Scorecard in the Banking System. The regression model showed a medium degree of fit, as reflected by (R) and (R^2) value (0.605), (0.336), which asserted that (0.336) of the explained variation in Banks Performance (Internal Process Performance) in the Banking System can be accounted by Knowledge Management (Storage and Application). On the other hand, Table (11) for the executive data set indicated the slope value of (0.237) and (0.229) for the regression line. This suggested that for a one unit increase in Knowledge Management (Storage and Application) the respective Banking System can significantly predict a (0.237) and (0.229) increase in Banks Performance (Internal Process Performance). Also table (11) shows that the analysis of variance of the fitted regression equation is significant with F value of (13.744). This is an indication that the model is a good one. In fact this supports the sub hypothesis three of the study.

sub hypothesis four There is no statistically significant effect of Knowledge Management Practices on Banks Performance using Learning Perspective of the Balanced Scorecard Perspectives in the Banking System at level ($\alpha \leq 0.05$).

Table (12) shows that Knowledge Management (Creation, Protecting and Application) has a significant effect on Banks Performance using Learning Perspective of the Balanced Scorecard in the (BS). The regression model showed a medium degree of fit, as reflected by (R) and (R^2) value (0.638), (0.407), which asserted that (0.407) of the

explained variation in (BP) (Learning Performance) in the Banking System can be accounted by Knowledge Management (Creation, Protecting and Application). On the other hand, Table (12) for the executive data set indicated the slope value of (0.215), (307) and (0.488) for the regression line. This suggested that for a one unit increase in (KM) (Creation, Protecting and Application) the respective Banking System can significantly predict a (0.215), (0.307) and (0.488) increase in Banks Performance (Learning Performance). Also table (12) shows that the analysis of variance of the fitted regression equation is significant with F value of (16.376). This is an indication that the model is a good one. In fact this support the sub hypothesis four of the study.

Table (12): Multiple regression analysis to test the sub hypothesis four of the study

Independent Variables	(B)	T-Value Calculate	Sig*	(DF)	(R)	(R^2)	F-Value Calculate	Sig*
Constant	0.780	2.118	0.036	6	0.638	0.407	16.376	0.000
Creation	0.215	2.214	0.028					
Sharing	-0.228	-2.010	0.046	143				
Storage	0.072	0.591	0.556					
Distributing	-0.055	-0.451	0.653					
Protecting	0.307	3.058	0.003	149				
Application	0.488	4.553	0.000					
* the impact significant at level ($\alpha \leq 0.05$)								
$Y_{14} = 0.781 + 0.215\ x_{11} - 0.228\ x_{12} + 0.074\ x_{13} - 0.055\ x_{14} + 0.307\ x_{15} + 0.488\ x_{16}$								

Resource: Prepared by the Researcher from Study Case Data, 2023, Dongola.

Conclusions

This study raised a number of questions, and developed hypotheses related to the study variables. The study results answered the study question and came up the following conclusions:

1. The level of Knowledge Management in the Banking system was found to be high with arithmetic mean (3.99) and standard deviation (0.678).
2. The level of Banks Performance in the Banking system was found to be high with arithmetic mean (4.11) and standard deviation (0.663).

3. There is a significant statistical effect of Knowledge Management (Creation and Application) on Banks Performance using the Balanced Scorecard Perspectives with a correlation coefficient of (0.669) at level ($\alpha \leq 0.05$). This result was consistent with the findings of (Almhameed & Slehat, 2013).
4. There is a significant statistical effect of Knowledge Management (Creation and Application) on Banks Performance using Financial Perspective of the Balanced Scorecard with a correlation coefficient of (0.584) at ($\alpha \leq 0.05$). This result agreed with the findings of (Al-Gazi, 2014).
5. There is a significant statistical effect of Knowledge Management (Creation and Storage) on Banks Performance using Customers Perspective of the Balanced Scorecard with a correlation coefficient of (0.574) at ($\alpha \leq 0.05$). This result was supported by the findings of (Salim, 2021).
6. There is a significant statistical effect of Knowledge Management (Storage and Application) on Banks Performance using Internal Process Perspective of the Balanced Scorecard with a correlation coefficient of (0.605). This result agreed with the findings of (Abdelhameed & Ezielden, 2022).
7. There is a significant statistical effect of Knowledge Management (Creation, Protecting and Application) on Banks Performance using Learning Perspective of the Balanced Scorecard with a correlation coefficient of (0.638) at level ($\alpha \leq 0.05$). This result was consistent with the findings of (Al-Gazi, 2014) and (Salim, 2021).
8. Sharing and Distributing has not direct effect on Banks Performance.

Recommendations

Based on the results of the study, the researcher suggests the following recommendations:

1. Banking System have to pay more attention to Knowledge Management Practices by holding training courses in how to exploit the knowledge available within the branches bank.

2. Banking System must provide financial and managerial support to knowledge management practices to improve performance through the use of the Balanced Scorecard Perspectives.
3. Banking System must pay more attention to Balanced Scorecard model that can clarify roles and expectations at all managerial banks levels.
4. Top management at Banking System should pay more attention to use existing knowledge to create and innovate new managerial systems.
5. Employees at Banks should improve Sharing and Distributing Knowledge because it hasn't significant effect on all Balanced Scorecard Perspectives.

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Appendix A

Names of Branches Banks Participated in the Study

No.	Branch Bank Name	No.	Branch Bank Name	No.	Branch Bank Name
1	Albaraka Dongola	6	Alneel Dongola	11	Alkhartoum Dongola
2	Albalad Dongola	7	Alneelain Dongola	12	Omdurman Alwatany Dongola
3	Albalad Alhafeer	8	Alislamy Dongola		
4	Alosra Dongola	9	Alzeraey Dongola	13	Alsudan Almarkazy Dongola
5	Aledkhar Dongola	10	Almozaria Dongola		