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THE STRUCTURAL MODEL OF CAUSAL RELATIONSHIPS BETWEEN KNOWLEDGE MANAGEMENT ELEMENTS, ORGANIZATIONAL MEMORY, AND KNOWLEDGE ACCUMULATION AT KING ABDULAZIZ UNIVERSITY

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ABSTRACT

The study was to examine the direct influence of the presence of the elements of knowledge management on the preservation of knowledge accumulation, the direct influence of the elements on the utilization of the organizational memory dimensions, and the direct influence of organizational memory on the preservation of knowledge accumulation at King Abdulaziz University. It also tested the indirect effect of organizational memory as mediating variable between the elements of knowledge management and the level of knowledge accumulation at the university through structural model of causal relationships of the three variables. The researcher used the descriptive correlational technique and selected all the members of the faculty at the King Abdulaziz University, amounting to 6,911 faculty members, and 388 respondents. Data collection was done using a valid and reliable questionnaire. The Amos v24 was utilized to analyze data in order to determine causal relationships. The results showed direct and indirect impacts of knowledge management and organizational memory practice on knowledge amassing. The direct path coefficient of the knowledge management elements on the knowledge accumulation was (0.09), the direct influence of knowledge management on the organizational memory was (0.93), and the direct influence of organizational memory on the knowledge accumulation was (0.88). The indirect path coefficient of knowledge management on knowledge accumulation across the organizational memory was (0.82), denoted that it has a great indirect influence. This proves that organizational memory is an important mediating variable, which can highly increase the effects of the knowledge management practices on the knowledge accumulation in the organization. The paper suggested to establish organizational memory in the university and use the determined causal model as the means of planning and implementing the university policies as the reference framework to make administrative and scholarly choices.

Key words: *structural model of causal relationships, application of knowledge management elements, organizational memory, knowledge accumulation, king abdulaziz university.*

INTRODUCTION

Knowledge is regarded as a fundamental pillar in building the competitive capabilities of organizations, and its institutional importance has increased significantly since the 1990s with the development of knowledge management concepts [2]. In light of digital transformations and rapid technological advancements, universities are increasingly required to adopt advanced models for preserving and leveraging accumulated knowledge, particularly in the context of academic staff mobility and the growing administrative challenges they face [18]. Universities represent an ideal environment for the production, storage, and application of knowledge, making the elements of knowledge management such as human resources, procedures, content, and technology a core foundation for achieving this objective [22][11].

However, the effective management of these elements cannot be fully realized without an institutional mechanism that safeguards experience from loss [1]. The real challenge lies not only in knowledge creation but also in its preservation over time [9]. This role is served by organizational memory that helps in the storage of tacit and explicit knowledge and their transfer between academic generations [4][21].

In this context, the knowledge accumulation can be viewed as the result of the interaction or interplay of the knowledge management practices and the implementation of the dimensions of organizational memory and its influence is reflected in the performance of the various institutions, the better use of human resources, and better-informed development decisions [3]. A number of scholars have stressed that organizational memory is a strategic pool of knowledge that reinforces the knowledge accumulation process by preserving the past experience of the organization and conveying it to the new generations of academics [21]. Knowledge accumulation therefore emerges as a result of knowledge management and organizational memory which is an interactive outcome and it is likely to affect various domains such as data analysis and classification, human resource use and continuous development [8].

In recent years, knowledge management has been closely linked to artificial intelligence (AI), a concept that can be used to improve the creation, storage, and transfer of knowledge within the organizations. The systems based on AI are applied in higher education to influence the knowledge accumulation and enhance decision-making based on predictive analytics [17]. There is also the introduction of digital organizational memory systems, which run on AI, to handle and store institutional knowledge more effectively. Such systems enable universities to record and save knowledge on real time with ease and hence the retention of important tacit and explicit knowledge even when staff has turned over. The scalability and continuity of knowledge is further facilitated by the implementation of cloud computing and big data analytics into these digital memory systems so that it can be available to academic and administrative departments [4][6].

Accordingly, the need has emerged for a structural model that links these variables within the university context, particularly in light of universities' pursuit of excellence and leadership in knowledge at both local and international levels. Therefore, this study aims to analyze the causal relationships between knowledge management elements and the dimensions of organizational memory, and to examine their impact on supporting knowledge accumulation among faculty members at King Abdulaziz University, in a manner that aligns with the university's orientation toward leadership in the knowledge society.

Study Problem and Research Questions

Despite the noticeable progress in developing technological infrastructure and human resources in universities, several studies [5][20] have confirmed the persistence of challenges in the integrated and sustainable implementation of knowledge management, particularly at King Abdulaziz University [19]. Considering the transition to a knowledge-based economy and the digitalization process, the necessity to provide institutional models that underpin the maintenance of accumulated knowledge and its use has become more significant than ever in the context of the poor correlation between knowledge management factors (content, human resources, procedures, and technology) with the aspects of

organizational memory (cultural, technological, administrative, and procedural) as several studies have shown [16].

The problem lies in the absence of an integrated framework that links knowledge management elements with organizational memory, which weakens the university's ability to preserve tacit knowledge and to invest it in improving academic and research performance [10]. Moreover, there is a lack of a comprehensive model that addresses this interrelationship within the context of real-world challenges. A review of previous studies, such as Dei and Van (2020) [11] and Arbāb et al. (2024), reveals that most research models have addressed knowledge management or organizational memory separately, without developing an integrated framework that links them in light of the practical challenges faced by higher education institutions. In addition, studies such as Escorcia Guzmán (2023) have focused primarily on procedural or technological dimensions, without adequately examining the dynamic relationship between knowledge and organizational memory from a knowledge accumulation perspective [12][13]. Furthermore, there is a notable scarcity of applied models that connect knowledge management elements to faculty performance, despite evidence from prior research indicating the role of these elements in preserving expertise and preventing knowledge loss resulting from staff mobility or [14].

Based on this, the study problem is as follows; the necessity to create a proposed model of applying the aspects of knowledge management that can help in supporting the knowledge accumulation among the faculty members and increasing the sustainability of the knowledge in the institution at King Abdulaziz University. The following main research question can thus be developed as the study problem:

What is the role of organizational memory as a mediating variable in the relationship between knowledge management elements and knowledge accumulation among faculty members at King Abdulaziz University?

From this main question, the following sub-questions emerge:

1. What is the direct effect of knowledge management elements on maintaining knowledge accumulation at King Abdulaziz University?
2. What is the direct effect of knowledge management elements on the application of organizational memory at King Abdulaziz University?
3. What is the direct effect of applying organizational memory on maintaining knowledge accumulation at King Abdulaziz University?
4. What is the indirect effect of organizational memory, as a mediating variable, on the relationship between knowledge management elements and knowledge accumulation among faculty members at King Abdulaziz University?

Study Objective

The objective of this study is to investigate the causal relationships within a structural model that examines the application of knowledge management elements and organizational memory in maintaining knowledge accumulation among faculty members at King Abdulaziz University.

SIGNIFICANCE OF THE STUDY

The importance of this work is manifested in two aspects:

Theoretical Significance

The research paper has the potential to add to the body of scientific knowledge in that it fills a gap in research, which is the formulation of a proposed structural model based on the foundation of the statistics. The model seeks to analyze the effects of implementing the knowledge management factors in the sustainability of the knowledge accumulation process and the need to reflect the role of organizational memory in the university environment. This in turn promotes the theoretical blending of the concepts of the knowledge management and the memory of the organization.

Applied Significance and Practical Significance

The practical importance of the research is that it can offer reference indicators that can guide decision-makers in the university in terms of their adoption of friendly strategies in implementing knowledge management and construction of organizational memory. These indicators may also help in improving the sustainability of knowledge accumulation and strategic initiatives and decisions through the use of data and knowledge.

STUDY BOUNDARIES

The boundaries of the study are defined as follows:

Thematic Boundaries

The study is limited to knowledge management elements as the independent variable, including (procedures, human resources, information technology, and content), and their effect on the dependent variable maintaining knowledge accumulation across its dimensions (data analysis, data classification, human resource utilization, and continuous development), through the effect of the mediating variable (organizational memory), which includes cultural, procedural, technological, and administrative memory.

Human Boundaries

The study was conducted on faculty members at King Abdulaziz University holding the academic ranks of teaching assistant, lecturer, assistant professor, associate professor, and professor.

Spatial Boundaries

The study was applied across all theoretical and scientific colleges at King Abdulaziz University.

Temporal Boundaries

The study was conducted during the first semester of the academic year 1447 AH.

Operational Definitions of Study Terms

The key terms of the study are defined as follows:

Knowledge Management Elements

These are the core components that contribute to the creation, storage, transfer, and application of knowledge within the university. They represent the infrastructure that enables universities to invest their knowledge resources to achieve strategic and operational objectives [7].

Operationally, knowledge management elements refer to an integrated set of components including content, human resources, procedures, and technology—that are employed within universities to create, store, share, and apply knowledge. These elements support the development of effective organizational memory and enhance knowledge accumulation among faculty members, and they are measured based on their availability and efficiency within the academic environment under study.

Organizational Memory

Organizational memory is defined by Aqdi and Al-Nouh (2023, p. 159) as the set of accumulated knowledge, experiences, and information retained by an organization over time, which influence decision-making processes, operations, and overall performance.

Operationally, organizational memory refers to an institutional system composed of tools, procedures, structures, and databases that function to preserve, store, and document accumulated knowledge and past experiences within the university whether tacit or explicit so that they can be retrieved and reused when needed to support decision-making, planning, and academic and administrative development processes.

Inference

The review of the literature points to the growing relevance of the concept of knowledge management (KM) in the modern universities, especially in its relation to the academic personnel mobility and the administrative issues. It highlights the importance of the organizational memory in terms of preservation and transfer of both tacit and explicit knowledge between the generations that contributes to the performance and decision making of the institutions. The use of AI-based systems, such as the digital organization memory and cloud computing, is further being integrated in the knowledge management practice of the organization, thereby making it easier to store and retain knowledge in real time. This review indicates that a structural model between knowledge management, organizational memory and knowledge accumulation is crucial to universities that are aimed at becoming leaders in the knowledge society especially in institutions of higher learning such as King Abdulaziz University.

The paper has the following structure: The introduction provides the background of the study where the importance of knowledge management and organizational memory in universities, specifically in King Abdulaziz University, is discussed. Then it defines the problem of study as well as the research questions, then the study objectives are explained to analyze the causal association among elements of knowledge management, organizational memory, and knowledge accumulation. The methodology section describes the way the research was conducted which involves Structural Equation Modeling (SEM) and the process of collection of data. Hypotheses of the study and findings are provided and results discussed. Finally, the paper ends with conclusions and recommendations on how to enhance the knowledge management practices and future research recommendations.

METHODOLOGY AND RESEARCH PROCEDURES

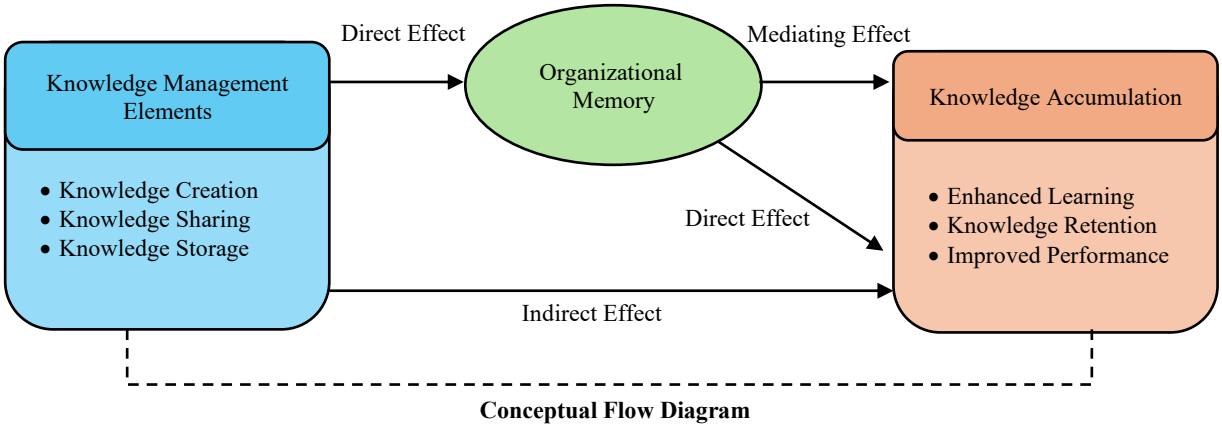

Figure1. Conceptual flow diagram of knowledge management elements, organizational memory, and knowledge accumulation

This figure 1 shows the causal relationships among Knowledge Management Elements, Organizational Memory and Knowledge Accumulation in a situation of a higher education institution. It shows the impact of knowledge creation, sharing, and storage on the knowledge organizational memory and how these aspects, in turn, can lead to the knowledge accumulation. The graph indicates clearly the direct, indirect and mediating effects of every relationship making it visibly represent the conceptual framework of the study.

Incorporation of Advanced Statistical Methods

Further statistical procedures were added to give a more in-depth analysis and a deeper explanation of the relationships between the variables. Particularly, the Mediation Analysis was applied, including bootstrapping (1,000 resamples), to determine the mediating impact of the organizational memory on the correlation between the knowledge management aspects and the increase of knowledge level, resting on the sample of 388 respondents. Multivariate Regression Analysis was used to pursue the interaction between the elements of knowledge management and the combined effect of these elements on knowledge accumulation. The best-fit model was ensured using model comparison methods such as Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) whereas the model fit was validated using indices such as Chi-square, Goodness-of-Fit Index (GFI) and the Root Mean Square Error of Approximation (RMSEA).

Research Method

This study adopted the descriptive correlational approach, as it is appropriate for the nature of the study objectives and for examining the validity of the proposed structural model hypotheses. Structural Equation Modeling (SEM) was employed using AMOS software, along with goodness-of-fit indices, to test the validity of the relationships within the proposed model and to assess the extent to which the model fits the empirical data.

Study Hypotheses

- **H01:** There is a statistically significant direct effect of the availability of knowledge management elements on maintaining knowledge accumulation at King Abdulaziz University.
- **H02:** There is a statistically significant direct effect of the availability of knowledge management elements on the application of organizational memory dimensions at King Abdulaziz University.
- **H03:** There is a statistically significant direct effect of the application of organizational memory on maintaining knowledge accumulation at King Abdulaziz University.
- **H04:** There is a statistically significant indirect effect of knowledge management elements on knowledge accumulation through the mediating role of organizational memory at King Abdulaziz University.

Study Population and Sample

The sampled population was all the faculty members of King Abdulaziz University, and the number of sampled members was 6,911, as indicated in the Center of Educational Statistics and Decision Support at the Ministry of Education under the 1447 AH academic year. To achieve the representative sample, data collection was to be carried out until the sample got the required number of responses of 388 valid responses. The sample size was determined with utmost care with the help of the sample size formula by Stephen Thompson who suggested the size of a sample to 364 at a significance of 0.05. The formula will consider the entire population, target confidence level, and margin of error, and the sampling was sufficiently powered to reach conclusions that could be generalized to the entire population of the faculty members in terms of their views on the subject of interest in the study.

Research Instrument

The research was based on a questionnaire that was created after a review of the past studies focusing on the study variables. The questionnaire had 72 questions which were divided into three major sections.

The initial section was used to determine the aspects of knowledge management at King Abdulaziz University.

The second part was the measure of organizational memory which concentrated on the availability of the dimensions of the institution that retain knowledge to the university level.

The third section was used in measuring knowledge accumulation, which measured the capability of the university preserving and developing accumulated knowledge.

Validity and Reliability Establishment Procedures

The content validity of the first draft of the questionnaire was checked by a group of professionals. Necessary revisions were made based on their feedback, and only items that achieved an agreement rate of no less than 80% were retained. In addition, internal consistency and reliability were examined for each dimension separately, as follows:

Knowledge Management Elements

Table 1. Pearson correlation coefficients between individual items and the total score of each dimension of knowledge management elements

Procedures		**Human Resources**		**Information Technology**		**Content**	
Item No.	**Correlation with Dimension**	**Item No.**	**Correlation with Dimension**	**Item No.**	**Correlation with Dimension**	**Item No.**	**Correlation with Dimension**
1	0.77**	7	0.71**	14	0.77**	20	0.79**
2	0.76**	8	0.73**	15	0.83**	21	0.70**
3	0.73**	9	0.69**	16	0.75**	22	0.76**
4	0.75**	10	0.74**	17	0.76**	23	0.73**
5	0.74**	11	0.76**	18	0.72**	24	0.75**
6	0.68**	12	0.81**	19	0.79**	25	0.84**
		13	0.76**			26	0.69**
						27	0.74**

** Significant at the 0.01 level

It is evident from table 1 that the correlation coefficients between each item and the total score of the dimension to which the item belongs ranged from 0.68 to 0.84, and all coefficients were statistically significant at the 0.01 level. In addition, the correlation coefficients between the dimensions and the total score of the scale were calculated, as shown in table 2.

Table 2. Pearson correlation matrix between the overall score of knowledge management elements and their dimensions

Dimensions	**Procedures**	**Human Resources**	**Information Technology**	**Content**
Procedures	–			
Human Resources	0.112	–		
Information Technology	0.035	0.050	–	
Content	0.032	0.088	0.019	–
Overall Score of Knowledge Management Elements	0.81**	0.78**	0.76**	0.79**

** Significant at the 0.01 level

It is evident from table 2 that all correlation coefficients were statistically significant at the 0.01 level, ranging from 0.76 to 0.81, which indicates the availability of internal consistency validity for the dimensions of knowledge management elements. In addition, reliability was assessed by calculating Cronbach's alpha coefficient and by applying the Spearman–Brown split-half method, as presented in table 3.

Table 3. Reliability coefficients of the first construct (application of knowledge management elements)

Dimensions	Number of Items	Cronbach's Alpha	Spearman–Brown Coefficient
Procedures	6	0.825	0.917
Human Resources	7	0.895	0.903
Information Technology	6	0.791	0.912
Content	8	0.913	0.904
All Items of the First Construct in the Questionnaire	27	0.940	0.886

The value of Cronbach's alpha reliability coefficient for the first construct reached 0.940, while the coefficients for its dimensions ranged from 0.791 to 0.913. The Spearman–Brown reliability coefficient reached 0.886, with values for the dimensions ranging from 0.903 to 0.917. These results indicate a high level of reliability for the instrument.

Second Construct of the Questionnaire: Organizational Memory

Table 4. Pearson correlation coefficients between individual items and the total score of each dimension of the second construct (organizational memory)

Cultural Memory		Procedural Memory		Technological Memory		Administrative Memory	
Item No.	Correlation with Dimension	Item No.	Correlation with Dimension	Item No.	Correlation with Dimension	Item No.	Correlation with Dimension
28	0.70**	34	0.87**	40	0.71**	45	0.75**
29	0.81**	35	0.88**	41	0.93**	46	0.77**
30	0.59**	36	0.74**	42	0.37*	47	0.64**
31	0.63**	37	0.76**	43	0.74**	48	0.69**
32	0.79**	38	0.73**	44	0.78**	49	0.41*
33	0.68**	39	0.82**			50	0.60**

** Significant at the 0.01 level. * Significant at the 0.05 level

The following table 4 contains the results of the correlation coefficients between individual items and the overall score in each dimension of the organizational memory (Cultural, Procedural, Technological, and Administrative Memory). The table displays the strength of the relationship between each of the items and respective dimension of which has statistically significant relationships borne by "**" ($p < 0.01$) and "*" ($p < 0.05$). As an example, the correlation between Cultural Memory and item 29 (0.81) is the highest, and between Technological Memory and item 41 (0.93) is the highest. The table shows differences in the degree of associations along the dimensions, which can give an idea of the extent of the representativeness of each item towards the specific dimension of organizational memory.

Internal consistency validity for the dimensions was also verified, as shown in table 5.

It is evident from table 5 that all correlation coefficients between the construct and its dimensions ranged from 0.91 to 0.94, and all were statistically significant at the 0.01 level. These results indicate the availability of internal consistency validity for the dimensions. In addition, the reliability index was calculated, as presented in table 6.

Table 5. Pearson correlation matrix between the overall score of the organizational memory construct and its dimensions

Dimensions	Cultural Memory	Procedural Memory	Technological Memory	Administrative Memory
Cultural Memory	–			
Procedural Memory	0.88**	–		
Technological Memory	0.89**	0.79**	–	
Administrative Memory	0.85**	0.81**	0.61**	–
Overall Score of the Construct	0.92**	0.94**	0.91**	0.93**

** Significant at the 0.01 level.

Table 6. Internal consistency reliability coefficients of the second construct (application of organizational memory)

Dimensions	Number of Items	Cronbach's Alpha	Spearman–Brown Coefficient
Cultural Memory	6	0.841	0.865
Procedural Memory	6	0.742	0.780
Technological Memory	5	0.688	0.794
Administrative Memory	6	0.821	0.835
All Items of the Second Construct	23	0.926	0.931

The internal consistency reliability coefficient (Cronbach's alpha) for the second construct reached 0.926, with values for its dimensions ranging from 0.688 to 0.841. In addition, split-half reliability was confirmed using the Spearman–Brown formula, with a coefficient of 0.931 for all items of the construct, while the coefficients for the dimensions ranged from 0.780 to 0.865. These results indicate that the construct demonstrates an acceptable level of reliability.

Knowledge Accumulation

Table 7. Pearson correlation coefficients between individual items and the total score of the knowledge accumulation construct

Data Analysis		**Data Classification**		**Human Resource Utilization**		**Continuous Development**	
Item No.	**Correlation with Dimension**	**Item No.**	**Correlation with Dimension**	**Item No.**	**Correlation with Dimension**	**Item No.**	**Correlation with Dimension**
51	0.65**	55	0.58**	60	0.61**	67	0.89**
52	0.67**	56	0.63**	61	0.63**	68	0.87**
53	0.69**	57	0.80**	62	0.84**	69	0.74**
54	0.74**	58	0.77**	63	0.92**	70	0.83**
		59	0.70**	64	0.75**	71	0.90**
				65	0.78**	72	0.81**
				66	0.89**		

** Significant at the **0.01** level.

It is evident from table 7 that all correlation coefficients between each item and the total score of the dimension to which it belongs were statistically significant at the 0.01 level, ranging from 0.58 to 0.92, which indicates the presence of internal consistency validity for the items of the construct. In addition, the correlation coefficients between the scores of each dimension and the total score of the construct were calculated, as shown in table 8.

Table 8. Pearson correlation matrix between the overall score of the knowledge accumulation construct and its dimensions

Dimensions	Data Analysis	Data Classification	Human Resource Utilization	Continuous Development
Data Analysis	–			
Data Classification	0.75**	–		
Human Resource Utilization	0.11	0.09	–	
Continuous Development	0.02	0.07	0.41*	–
Overall Score of the Construct	0.88**	0.90**	0.89**	0.79**

** Significant at the 0.01 level. * Significant at the 0.05 level.

It is evident from table 9 that the correlation coefficients were statistically significant, ranging from 0.79 to 0.90, which indicates the availability of internal consistency validity for the dimensions of knowledge accumulation. In addition, the reliability index was calculated, as shown in table 9.

Table 9. Reliability coefficients of the third construct (knowledge accumulation)

Dimensions	Number of Items	Cronbach's Alpha	Spearman–Brown Coefficient
Data Analysis	4	0.711	0.800
Data Classification	5	0.785	0.810
Human Resource Utilization	7	0.909	0.925
Continuous Development	6	0.884	0.891
All Knowledge Accumulation Items	22	0.930	0.945

The internal consistency reliability coefficient (Cronbach's alpha) for the knowledge accumulation construct reached 0.930, with values for its dimensions ranging from 0.711 to 0.909. Using the split-half method calculated through the Spearman–Brown formula, the reliability coefficient reached 0.945, while the coefficients for the dimensions ranged from 0.800 to 0.925. These results indicate that the knowledge accumulation construct demonstrates a high level of reliability.

STUDY RESULTS AND DISCUSSION

To answer the main research question—What is the role of organizational memory as a mediating variable in the relationship between knowledge management elements and knowledge accumulation among faculty members at king abdulaziz university? the structural equation model was developed. The study relied on a set of model fit indices, and the results are presented as follows:

Results of the Research Model Fit Indices (Data–Model Fit of the Proposed Model)

Table 10. Goodness-of-fit indices of the research model according to acceptance or rejection criteria

No.	Goodness-of-Fit Index	Index Value	Ideal Range / Criterion	Decision
1	Chi-Square Test (Significance Level)	72.73 (0.165)	Non-significant and small value	Acceptable
2	Chi-Square to Degrees of Freedom Ratio (CMIN/DF)	1.173	≤ 2 Good, ≤ 5 Acceptable	Very Good
3	Goodness-of-Fit Index (GFI)	0.972	≥ 0.90	Very Good
4	Normed Fit Index (NFI)	0.953	≥ 0.90	Very Good
5	Relative Fit Index (RFI)	0.941	≥ 0.90	Very Good
6	Incremental Fit Index (IFI)	0.993	≥ 0.90	Very Good
7	Tucker–Lewis Index (TLI)	0.991	≥ 0.90	Very Good
8	Comparative Fit Index (CFI)	0.993	≥ 0.85	Very Good
9	Root Mean Square Error of Approximation (RMSEA)	0.021	≤ 0.08 Good, ≤ 0.05 Excellent	Very Good

Source: Prepared by the researchers based on the output results of AMOS software (V.26).

Structural Equation Modeling (SEM) was employed using Confirmatory Factor Analysis (CFA) through AMOS software (AMOS–SPSS, V26) to verify data fit and to examine both direct and indirect effects. This was conducted to identify statistically significant effects at the significance level ($\alpha \leq 0.05$) of the degree of application of knowledge management elements on knowledge accumulation through the mediating role of organizational memory. The assumptions of the structural model were verified, as presented in table 10.

It is clear that the study model as shown in table 10 has an acceptable fit that supports the strength and validity of the causal model proposed to explain the relationship between the knowledge management factors, organizational memory and knowledge accumulation at King Abdulaziz University. There were good-of-fit criteria and this showed that the model was of high quality. These findings may be summarized as follows:

- The goodness-of-fit indices of the proposed model were all within the very acceptable range thereby showing that the model has attained the ideal or acceptable values as per the normal statistical standards.

- Value of Chi-square test (72.73) and the significance level (0.165) is non-significant hence the model can be accepted.
- Chi-square/degrees of freedom Chi-square/degrees of freedom ratio (CMIN/DF) was 1.173, and that is less than the maximum acceptable value that is equal to 2, indicating the good model fit.
- All the fit indices such as Goodness-of-Fit Index (GPI) and others like NFI, RFI, IFI, TLI and CFI had exceeded 0.90, which once again supported the reliability and soundness of the model fit.
- The value of Comparative Fit Index (CFI) was also 0.993, which is above the recommended area of 0.85, which is a good indicator of the strength of the proposed model.
- The value of the Root Mean Square Error of Approximation (RMSEA) was 0.021, which is much lower than 0.05, and thus, there is an excellent model fit between the proposed model and the empirical data.
- According to these findings, the suggested statistical model can be considered extremely robust, as it has a high good of fit and a high level of explanatory power of the relationships between the study variables (the elements of knowledge management, organizational memory, and knowledge accumulation).

The Testing of the Model Hypotheses

The research hypotheses that will be tested in the given research are as follows and the outcomes of each hypothesis will be discussed systematically:

H1: The direct effect of the availability of knowledge management elements on the knowledge accumulation maintenance in King Abdulaziz University is statistically significant.

Result: The direct impact of the knowledge management factors on the accumulation of knowledge was determined to be statistically significant, as the path coefficient is 0.09 with a critical ratio of 2.29 ($p < 0.05$). This effect is rather weak, but it underlines Hypothesis 1. This shows that elements of knowledge management do play a role in accumulation of knowledge, but indirectly through knowledge memory in an organization.

H2: The direct effect of the presence of the elements of knowledge management on the use of organizational memory at king Abdulaziz University is statistically significant.

Result: The path coefficient had a high degree of significance, and the path coefficient between the elements of knowledge management and organizational memory was 0.93 and the critical ratio was 8.403 ($p < 0.01$). This is in favour of Hypothesis 2 and shows a positive relationship that is very strong.

H3: The effect of application of organizational memory on the knowledge accumulation maintenance in King Abdulaziz University is statistically significant.

Result: There was a strong direct impact of organizational memory on knowledge accumulation and its path coefficient was 0.88 and critical ratio was 6.035 ($p < 0.01$). This confirms Hypothesis 3, which ascertained that organizational memory is relevant in perpetuating knowledge accumulation.

H4: Organizational memory indirectly mediates the effect of knowledge management elements on the accumulation of knowledge in King Abdulaziz University and the effect is statistically significant.

Result: The mediated impact of the elements of knowledge management on the knowledge accumulation, through the organizational memory, was significant with the path coefficient of 0.82. This confirms Hypothesis 4 and the significance of the organizational memory as a mediator variable.

In figure 2 presents the hypothesized model of the study using path analysis through AMOS software (V26). The figure 2 illustrates both the direct and indirect relationships among the study variables. As demonstrated, the aspects of knowledge management have a direct positive influence on the knowledge accumulation and the influence is also indirectly transferred through the organizational memory as the mediating variable.

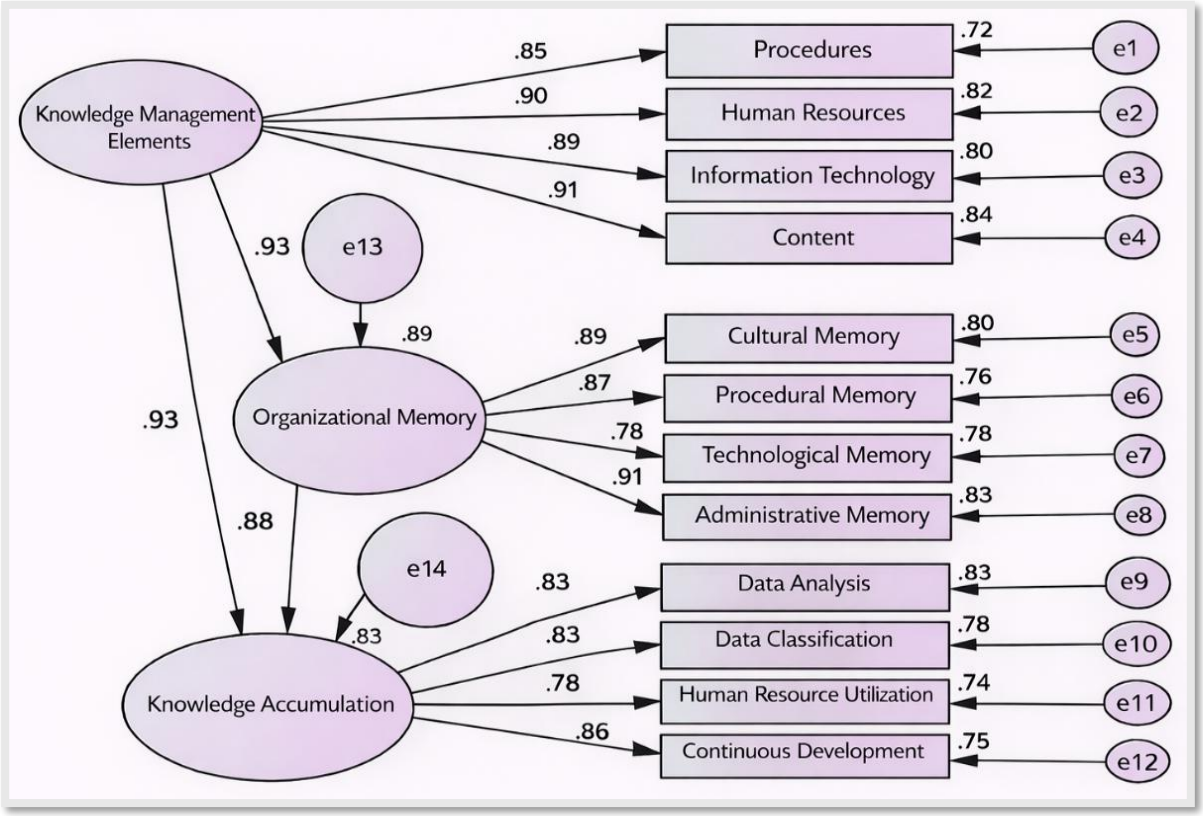

Figure 2. Illustrates the structural equation model, presenting the results of the causal relationships among the study variables

The standardized coefficient of direct effect between the elements of knowledge management and the organizational memory is 0.93 which implies there is strong positive relationship whereas the correlation between organizational memory and knowledge accumulation is denoted by 0.88 and it offers a strong mediating effect of organizational memory. These results prove the adequacy of the conceptual framework of the given model since all the standardized coefficients are within the range which is accepted in the scientific practice (≥ 0.70). This implies the good quality of structural representation of the observed indicators to increase the credibility of the model in the explanation of the relationships between the latent variables.

Table 11. Results of the overall structural model analysis with organizational memory as a mediating variable in the relationship between the application of knowledge management elements and knowledge accumulation

Type of Effect	Variables	Standardized Path Coefficients	Estimated Path Coefficient	S.E.	C.R.	Significance Level
Direct	Application of Knowledge Management Elements → Knowledge Accumulation	0.09	0.192	0.084	2.29	***
Direct	Application of Knowledge Management Elements → Organizational Memory	0.93	0.605	0.072	8.403	***
Direct	Organizational Memory → Knowledge Accumulation	0.88	0.688	0.114	6.035	***
Indirect	Application of Knowledge Management Elements → Organizational Memory → Knowledge Accumulation	0.820	–	–	–	***

*** Statistically significant at the 0.01 significance level.

On this basis, these findings form a firm foundation when making more accurate conclusions when addressing the effects of knowledge management in the aiding knowledge accumulation via the organizational memory pathway. Table 11 shows the findings of the general structural model analysis of the research that revealed the mediating role of the organizational memory in the relationship between the dimensions of knowledge management components and dimensions of knowledge accumulation.

The following presents the results addressing the study questions and testing its hypotheses.

(1) What is the direct effect of knowledge management elements on maintaining knowledge accumulation at King Abdulaziz University?

The results of the study revealed that the application of knowledge management elements has a direct effect on maintaining knowledge accumulation at King Abdulaziz University, with a path coefficient of 0.09. This effect is statistically significant, with a critical ratio (C.R.) of 2.29; however, it is considered relatively weak. This observation shows that the mediating position of organizational memory is significant in enhancing the relationship, which indicates the existence of effective partial mediation.

This finding can be correlated with the statements made by Baron and Kenny (1986) and Kline (2023) [15], who insisted that indirect effects can be significant even in case of a weak direct effect, which supports the role of mediating variables in the explanation of complex cause-and-effect relationships.

The results discussed here confirm the hypothesis of the research that the efficiency of elements of knowledge management is not directly related to better knowledge accumulation; instead, the latter is achieved in terms of organizational memory as the institutional structure that ensures the preservation as well as organization of knowledge. In addition, the standardized regression weights of the observed indicators demonstrated high levels, ranging from 0.85 to 0.91, indicating strong explanatory power for the latent variables. The content dimension recorded the highest loading (0.91), followed by human resources (0.90), then information technology (0.89), while procedures recorded (0.85). This pattern reflects the integration of these elements in supporting the knowledge infrastructure and enhancing knowledge accumulation within the university.

(2) What is the direct effect of knowledge management elements on the application of organizational memory at King Abdulaziz University?

The findings show that the use of the knowledge management aspects has a direct and strong influence on the organizational memory with a path coefficient of 0.93, which depicts a positive connection between the two variables. This is the connection that can be described as one of the most potent direct impacts in the model suggested.

Moreover, the results show that the organizational memory construct has a significant strength of association with its sub-dimensions with all standardized coefficients falling within a high range (0.87 0.91), which implies that there is high internal homogeneity of this construct. Administrative memory showed the highest loading of 0.91, which points to the importance of administrative experience and the vested organizational practices in the influence of creating organizational memory. It was then succeeded by cultural memory (0.89) and technological memory (0.88), which demonstrate the significance of informal and technical knowledge in the creation of the knowledge repository in the university.

The coefficient of 0.87 recorded by procedural memory highlighted the significant role played by organizational procedures in facilitating and strengthening the aspect of knowledge management.

(3) What is the direct impact of the use of organizational memory to sustain the knowledge accumulation at King Abdulaziz University?

Organizational memory has a direct and positive influence on the accumulation of knowledge, and a path coefficient of 0.88 indicates the significance of the organizational memory in maintenance of the knowledge accumulation.

In as far as the knowledge accumulation construct is concerned, the findings showed that the standardized coefficients of the knowledge accumulation construct had strong coefficients of representation of the knowledge accumulation construct with a range of 0.86 to 0.91. Data analysis has been revealed as the most representative indicator, and its standardized loading is 0.91, which is the central significance of analytical capability to the enrichment of the institutional knowledge base. Besides, the data classification (0.88) and human resource utilization (0.86) and continuous development (0.86) indicators showed a high level of correlation with knowledge accumulation.

These results indicate that the better universities foster the focus on the continuous improvement, take advantage of the capabilities of their human resources, and structure their data in a way that facilitates the formation and maintenance of long-term knowledge capital.

(4) What is the indirect impact of the use of organizational memory as the mediating variable in the correlation between the elements of knowledge management and the accumulation of knowledge among the faculty members at the King Abdulaziz University?

The results of the path analysis done on AMOS software showed that there is a high indirect impact of knowledge management factors on knowledge accumulation mediated by organizational memory. The following coefficient of the indirect effect was obtained to be 0.82 due to the high correlation between the aspects of the knowledge management and the organizational memory (0.93), and the correlation between the organizational memory and the knowledge accumulation (0.88). This observation shows that the major impact of knowledge management factors is not passed directly to the advancement of knowledge accumulation; instead, it is mainly achieved via the activation of organizational memory as an institutional repository to store, retrieve and exchange knowledge in the university. This means that the indirect effect is more than the direct effect.

This finding confirms the hypothetical definition of organization memory which highlights the pivotal mediating process of organizational memory in converting knowledge management practices into accumulated knowledge which is sustainable. The level of investment on knowledge management aspects is still weak in its effects unless it is reinforced by effective organizational mechanisms in the construction of organizational memory. The results also reveal that the size of the organizational memory such as cultural, procedural, technological, and administrative dimensions helps in structuring of knowledge and transformation of knowledge as the content of the knowledge, the procedures, and technologies into actionable knowledge, which facilitates decision-making and organizational learning.

Besides, the coefficients of determination (R2) values provide evidence concerning the efficiency of the model in uncovering the causality relationship. The degree of variance, which was explained by the dimensions of knowledge accumulation was between 0.326 to 0.507 and the dimensions of organizational memory between 0.382 to 0.498 and the dimensions of elements in knowledge management between 0.413 to 0.498. These values show that the model provides an overall explanation of a significant proportion of variance in the variables of the study.

In this respect the findings verify that organizational memory is an effective and necessary mediating factor to make the most out of knowledge management and knowledge collection in a more profound and sustainable way in the university case.

Summary of Findings

The statistically significant effect of implementing the elements of knowledge management in knowledge accumulation maintenance was observed directly, but the effect was not very strong, with the path coefficient of 0.09.

- A very high direct impact of knowledge management factors on organizational memory at King Abdulaziz University was found with the path coefficient value of 0.93, which means that knowledge management practices have a positive effect on the strengthening of organizational memory aspects.

- A high and statistically significant direct organizational memory effect on the continuation of knowledge accumulation with path coefficient of 0.88 was obtained which establishes the importance of organizational memory in ensuring the continuity and organization of knowledge in the university.
- A considerable mediating impact of the elements of knowledge management on the knowledge accumulation as an extension of the organizational memory was revealed, which proved the hypothesis of partial mediation and emphasized the significance of establishing an effective organizational memory to convert the acquired knowledge into sustainable one.

Recommendation

It is proposed that based on the study findings, the following recommendations can be given:

- Enhancing the organizational memory institutionalization of King Abdulaziz University on all its dimensions since it has been proven as a central mediator in the connection between knowledge management and knowledge accumulation. This can be done by creating institutional knowledge repositories, making sure they are kept material and regularly documenting administrative, academic, and educational experiences in the university.
- Adopting knowledge management strategies in a integrated and systematic approach like the development of institutional procedures that facilitate the knowledge acquisition, storage, sharing, and utilization processes ensuring coherence of these processes and coordination with the university strategic objectives.
- The development, organization and governance of knowledge content in order to make the content accurate, accessible and reused effectively, thus increasing its contribution to the institutional learning and its sustainability in knowledge.
- The knowledge capacity of the human resource by designing and providing specific training on knowledge management, organization memory and knowledge-sharing practices, with the focus of improving competencies of the faculty and the staff in knowledge management and transfer.
- Integrating the knowledge accumulation notion into the strategic planning scheme of the university, interconnecting the everyday knowledge practices with the long-term institutional objectives, and converting the gained knowledge into a long-lasting organizational asset that will facilitate the process of making evidence-based decisions and promoting the further advancement of academic and administrative performance.

Future Research Recommendations

Considering the obtained results, the research suggests the following future research directions:

- Artificial intelligence technologies to maintain the knowledge accumulation in the context of organizational memory at King Abdulaziz University: a conceptual proposal.
- A suggested framework to implement knowledge management procedures as one of the strategies to maintain accumulation of knowledge in research productivity at King Abdulaziz University.
- The suggestion of a model of creating a center of accumulating knowledge that can lead to improvements of organizational memory within universities.

CONCLUSION

The paper has analyzed the causal relationships between the knowledge management elements, organization memory and knowledge accumulation among students in King Abdulaziz University. The results showed that knowledge management elements have a positive effect on the organizational memory with a significant direct effect (path coefficient of 0.93) and organizational memory, in its turn, is very important in maintaining the knowledge accumulation (path coefficient of 0.88). Nevertheless, the direct relationship between knowledge management factors and knowledge accumulation was comparatively insignificant (path coefficient of 0.09), instead of focusing on the mediating nature of organizational memory that boosts memorizing of knowledge and performance in the university.

The strength of the model was proved by means of statistical analysis with the help of structural equation modeling (SEM), and the goodness-of-fit indices were within optimal values (e.g., RMSEA = 0.021, CFI = 0.993). The indirect relationship between knowledge management aspects and knowledge buildup via organizational memory was identified to be very strong (path coefficient of 0.82), taking into account that the organizational memory is an essential tool in the conversion of knowledge management practices into long-term knowledge sustainability. These findings highlight the essence of establishing organizational memory systems to maintain institutional knowledge, enhance academic performance, and make strategic decisions within the institutions of higher learning.

REFERENCES

[1] Albadawi BI, Salha MO. Role of knowledge management in ensuring quality of higher education in Al-Quds University from the academic staff's perspective. The Arab Journal for Quality Assurance in Higher Education. 2021 Apr 14;14(47):1-30. https://doi.org/10.20428/ajqahe.v14i47.1756

[2] Alavi M, Leidner DE. Knowledge management and knowledge management systems: Conceptual foundations and research issues1, 2. MIS quarterly. 2001 Mar 1;25(1):107-36. https://doi.org/10.2307/3250961

[3] Al-Mashkoor RJ, Dawood DS, Ayash LM. Awareness of Chemical Innovations Among Teachers of Chemistry. Turkish Journal of Computer and Mathematics Education. 2021;12(11):383-94. https://doi.org/10.17762/turcomat.v12i11.5889

[4] Al-Juhani AB. Institutional excellence in Saudi universities in light of the criteria of the Malcolm Baldrige National Quality Award (MBNQA)-Tabuk University as a model. Educational Research and Innovation Journal. 2021 Oct 1;1(3):85-138. https://doi.org/10.21608/erji.2021.203988

[5] Aladwan SA, AL-Yakoub TA, Adaileh AM. Challenges of knowledge management in the public sector: evidence from the King Abdullah Award for Excellence in Jordan. The TQM Journal. 2022 Nov 29;34(6):1896-913. https://doi.org/10.1108/TQM-09-2021-0253

[6] Imhanzenobe J, Adejumo O, Ikpesu O. A review of knowledge management and its application in the contemporary business environment. African journal of business management. 2021 Oct 31;15(10):274-82. https://doi.org/10.5897/AJBM2021.9223

[7] Alotaibi MN, Al Rabee AA. The role of najran university in achieving economic development in the region from the point of view of faculty members. International Journal of Professional Business Review. 2023;8(7):90. https://doi.org/10.26668/businessreview/2023.v8i7.2709

[8] Al Halbusi H, Pérez-González D, Abdullah Alsuwaiket M. Exploring the nexus of knowledge management, absorptive capacity and corporate sustainable development: the moderating role of information technology (IT). Business Process Management Journal. 2025 Sep 4;31(5):1684-702. https://doi.org/10.1108/BPMJ-08-2024-0679

[9] Bai H. Role of digital technology in transforming organizational competencies influencing green economy: moderating role of product knowledge hiding. Frontiers in Psychology. 2021 Dec 23; 12:792550. https://doi.org/10.3389/fpsyg.2021.792550

[10] Casey AJ, Olivera F. Reflections on organizational memory and forgetting. Journal of Management Inquiry. 2011 Sep;20(3):305-10. https://doi.org/10.1177/1056492611408264

[11] Dei DG, van der Walt TB. Knowledge management practices in universities: The role of communities of practice. Social sciences & humanities open. 2020 Jan 1;2(1):100025. https://doi.org/10.1016/j.ssaho.2020.100025

[12] Guzman JH, Zuluaga-Ortiz RA, Garizabal-Donado LE, Mora-Garcia YA, Sandoval-Karam M, Molina-Guerrero CJ, Delahoz-Dominguez EJ. Determining elements used to measure knowledge management in higher education institutions' research divisions. Procedia Computer Science. 2023 Jan 1; 224:538-43. https://doi.org/10.1016/j.procs.2023.09.078

[13] Aldighrir WM. Crisis Management in Saudi Arabian Universities: Evaluating Plans, Challenges and Obstacles Through a Cross-Sectional Study. European Journal of Education. 2024 Dec;59(4): e12767. https://doi.org/10.1111/ejed.12767

[14] Hussein AM, Taher MH, Hameed LM. Employees retention strategy and its impact on organizational memory: exploratory research for the opinion of faculty members at private colleges on Baghdad. Academic Journal of Interdisciplinary Studies. 2021 Jan;10(1):357-372. https://doi.org/10.36941/ajis-2021-0030

[15] Kline RB. Principles and practice of structural equation modeling. Guilford publications; 2023 May 24.

[16] AlMulhim AF. The impact of administrative management and information technology on e-government success: The mediating role of knowledge management practices. Cogent Business & Management. 2023 Dec 31;10(1):2202030. https://doi.org/10.1080/23311975.2023.2202030

[17] Ministry of Education. (1447 AH). Education statistics and decision support center: Higher education statistics. https://moe.gov.sa/ar/knowledgecenter/dataandstats/edustatdata/Pages/default.aspx

[18] Alyousef A, Alkol M. Impact of Structural Capital on Organizational Memory: A Case Study. Research Journal of Maaref University of Applied Sciences. 2025 Sep 17;1(1):6. https://doi.org/10.66422/mdj84828

[19] Hasan AH, Mohd Ali B, Kumar AT, Sovaniski T. Role of public budget in controlling public expenditures. 2021 Jun 19. https://dx.doi.org/10.2139/ssrn.3889563

[20] Al-Olayani FM, El Emary IM, Aqili OM. Knowledge management practices at the King Abdulaziz University to achieve sustainable competitive advantages in light of the modern university system & Saudi Arabia's Vision 2030. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies. 2021 Apr;12(7):1-0. https://doi.org/10.14456/ITJEMAST.2021.136

[21] Adel Odeh AH, Ammar A, Tareq AO. The mediation role of the organizational memory in the relationship between knowledge capturing and learning organization. Cogent Business & Management. 2021 Jan 1;8(1):1924933. https://doi.org/10.1080/23311975.2021.1924933

[22] Yang G. Knowledge element relationship and value co-creation in the innovation ecosystem. Sustainability. 2024 May 19;16(10):4273. https://doi.org/10.3390/su16104273