Knowledge Management Processes and Innovative Practices as Correlates of Librarians' Productivity: A Factor Analysis Approach

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ABSTRACT

The study investigated the relationships among Knowledge Management Process (KMP) factors influencing librarians' innovative performance in information service delivery in Nigerian libraries with the aim of establishing a framework for enhancing library services in the face of rapid technological advancement. The adopted a concurrent mixed-research approach employing both quantitative data through correlation research design using descriptive and multivariate factor analysis methods and a qualitative data through an in-depth interview method on a sampled 207 librarians. The study found that knowledge sharing through social-media and blogs, Cloud-Based library systems, facilitating knowledge transfer through collaborative platforms and adopting Artificial Intelligence are the innovative KM practices that improve librarians' productivity. Inadequate ICT infrastructure and resistance to change are impediments to KM Adoption. Using a factor analysis approach, the study explores the underlying multidimensional relationships among KM and innovative practice variables and condenses them into a smaller set of components for model and instrument development. The study found that the KM process (creation, dissemination and sharing) (β=0.348, t=5.899, $p < .01$, N = 207) and innovative practices (β=0.620, t=10.496, $p < .01$, N = 207) enhance librarians' productivity. The results of the factor analysis revealed a 0.960 KMO, showing an adequate sample size. The study identified and retained 4 factors with sufficient eigenvalue in Factor 1 (15.549), Factor 2 (7.791), Factor 3 (4.134), and Factor 4 (2.261), significantly greater than the randomly generated eigenvalue of parallel analysis. The CFA revealed CMIN/DF=1.389, RMSEA=0.043, TLI=0.990, and CFI=0.991, which provides an acceptable hypothetical model. The findings were used to develop a KM framework "Innovative KM Process Conceptual Framework" as the contribution of the study. The study highlights the importance of the factor analysis approach as a mechanism for enhancing librarians' productivity and improving library services and recommends the application of a strategic approach to increase productivity.

Keywords: Knowledge Management Process, KM Innovative Practices, Factor Analysis Approach, Librarians' Productivity, KM Process Instrument, KM Framework

INTRODUCTION

The rapid transformation of information technology has changed the roles of libraries and librarians, particularly in this digital age. Since libraries are knowledge-driven organizations, they must manage enormous volumes of information while also encouraging innovation to adapt to the changing requirements of their patrons (Diab, 2021). In this instance, increasing the productivity and efficacy of librarians depends heavily on knowledge management (KM) processes, which include knowledge generation, sharing, and utilization. Innovative methods can also result in better services, happier customers, and increased output in library environments. The quest for

a good leadership structure, involving the management of resources, information technology, and culture, is the most critical factor in the implementation of Knowledge Management (Ghosh, Milton and Mohanta, 2024). The overall objective of knowledge management is to create new value and use this knowledge to enhance and refine individual competencies in various domains and knowledge bases to meet comprehensive organizational goals.

Innovation in libraries is not just about using new technology. This includes introducing new services, such as finding innovative ways to address problems and use social media to reach a bigger audience. Librarians are key knowledge workers and need to innovate to stay relevant in a rapidly changing information landscape. This is going to help firms manage digital transformation better, better service the expectations of multiple user groups, and ultimately perform better themselves. According to Munir (2022), KM practice helps organisations increase their performance and productivity through better decision-making, problem-solving, and innovation. Ugwu & Ejikeme (2023) supported that KM and organisational culture had beneficial and significant impacts to job performance.

Knowledge management (KM) posits a relationship between knowledge as an organisational asset and the organization's goals, objectives, and strategies (Dei, 2021; Tang, 2017). The efficacy of the Knowledge Management process, executed by designated personnel and sophisticated technological solutions, is predominantly contingent upon the contributions and consumption of knowledge by libraries and librarians. An effective knowledge management strategy, thorough analysis, technological implementation, and stakeholder engagement will guarantee the success of knowledge management projects (Mittal & Kumar, 2019). Knowledge managers are increasingly delivering information in a more accessible format, utilising concise, practical suggestions instead of lengthy papers. This necessitated the implementation of a uniform, standardised format for all papers to facilitate staff in swiftly locating the information they urgently require. Establishing essential procedures that facilitate users in creating, accessing, and integrating knowledge into their daily work. Knowledge dissemination is being facilitated for librarians via novel techniques including social media platforms, wikis, video conferencing, and mobile applications. These trends have transformed the conventional sharing process activities from the burdensome Reference Service Desk to an enhanced IT problem-solving methodology.

The connection between knowledge management processes and innovation practices and information service delivery is crucial. Innovation Practice is regarded as a knowledge-centric process focused on generating novel ideas, markets, and services to secure competitive advantages for the business, whereas KM procedures involve the creation, sharing, storage, and utilisation of knowledge that facilitate innovation performance. Inków (2020) asserted that the concept of innovation capability is intricate, multivariate, and multiple, intimately linked to the dynamic of the organisational environment.

Productivity is a metric that assesses the efficiency with which firms and organisations transform employee labour, along with materials and machinery, into goods and services. Librarians' productivity denotes the degree of service output achieved via the use of skills that enhance the library's capability to fulfil users' information requirements via efficient service delivery. The process of knowledge generation, acquisition, sharing, or utilisation inside a company will enhance employee abilities and facilitate innovation (Rezaei, Khalilzadeh & Soleimani, 2021). The productivity of librarians is essential for service delivery in the library, as academic and research achievements depend on them. The quality of the office environment and the flow of information influence employee motivation, performance, and productivity.

The literature indicated a lack of consensus regarding the optimal Knowledge Management Systems that libraries should adopt to achieve competitive advantage. Ghosh, Milton, and Mohanta (2024); Tahleho and Ngulube (2022) asserted that the elements of a supportive organisational culture are frequently recognised as a critical determinant of knowledge management success. The value chain is an effective instrument for identifying strategic initiatives that secure competitive advantages for libraries. KM domain is diverse, characterised by several studies that have produced various models (Tahleho and Ngulube, 2022; Inków, 2020; Elezi and Bamber, 2018). There is a scarcity of research demonstrating how knowledge management models align with the effective execution of the knowledge management process in libraries and information centers.

This research aims to clarify the mechanisms of knowledge management practiced by librarians, emphasising

the mediating role of collaborative innovative practices in the delivery of information services, against the background of knowledge management and innovative capability models. The research examined examine the intricate links among factors affecting librarians' innovative performance in information service delivery through the application of multivariate exploratory and confirmatory factor analysis (EFA & CFA) methodologies.

STATEMENT OF PROBLEM

In today's technology-driven society, libraries face increasing competition in service delivery from other information and documentation centers, making it imperative for academic libraries to adapt to innovative KM practices to improve products, services, and customer relationships to stay competitive. This requires them to manage the flow of information across the organization. Though the value of knowledge management (KM) in improving organizational performance is becoming more widely acknowledged, many libraries in developing nations like Nigeria, find it difficult to fully integrate these practices because of issues like poor technology access, a lack of training opportunities, and inadequate support from management.

Although librarians are essential to the smooth functioning of academic libraries, their ability to innovate in their duties and apply knowledge management strategies is a key factor in determining their productivity. According to recent studies, KM adoption is strongly influenced by major predictors such as teamwork, leadership vision, access to digital tools, and ongoing professional development (Ghosh, Milton and Mohanta, 2024; Tahleho and Ngulube, 2022; Olayemi and Olayemi, 2021). In academic libraries, KM goes beyond investments in technology, it requires facilitating the culture and processes that enable the effective combination of intellectual proficiencies and social competencies.

Understanding how KM processes, creative behaviors, and predictors synergistically correlate with academic librarian productivity remains a major knowledge gap despite a plethora of KM studies. Creating a complete model that incorporates these elements is the central idea behind the research problem to increase librarians' ability to innovate, manage knowledge, and provide better services. There is also a lack of standardized instruments designed specifically to measure the efficiency of KM practices in libraries, particularly in the Nigerian context, which makes it difficult to assess the impact of KM on librarians' productivity.

Several factor analyses studies have been conducted on the KM process; Rezaei, Khalilzadeh & Soleimani (2021) examine the mediating role of human capital between the KM process and employee performance; Cruthaka (2019) and Saied et al. (2021) explored the role of learning as a mediating variable between different elements of the KM process and service quality and Li et al. (2020) identified the influence of KM practices on organizational performance with the mediating role of innovative practices as well the moderating role of opportunity recognition in KM process. These previous studies addressed the positive effects of factors of KM but paid little attention to developing models for studies on measuring librarians' productivity in relation to KM practice.

The competitive information dissemination environment calls for a robust model for IT-related information application, dissemination, and retrieval and processing mechanism, which leads to the successful dissemination of knowledge. Factor analysis was used to develop and verify the proposed innovative KM process model provided a framework for using the KM process to improve productivity, increase innovation, reduce risk, and enhance competitiveness among librarians. By adopting KM perspectives, libraries can reduce the time spent searching for information and make better decisions.

OBJECTIVES OF THE STUDY

The main objective of the research is to investigate the relationship between KM processes and the role of innovative practices in predicting librarians' productivity. The study set to achieve this broad objective through the following specific objectives:

1. To identify the factors of innovative KM practices that influence librarians' productivity;
2. To assess the perception of librarians towards implementing Knowledge Management Process
3. To investigate the relationship between knowledge management (KM) processes and librarians' productivity towards producing a standardised KM research instrument.

4. To identify the challenges associated with the implementation of KM Technologies in Nigerian libraries
5. To create a conceptual framework reflecting the context and practices of knowledge management in libraries.

RESEARCH HYPOTHESIS

The hypotheses of the study are:

H_a1: Knowledge Management Processes statistically influence the productivity of librarians in Libraries in Nigeria.

H_a2: Innovative Practices statistically influence the productivity of librarians in Libraries in Nigeria.

LITERATURE REVIEW

The literature review presents the academic discourse on knowledge management (KM) procedures, innovative techniques, and the productivity of librarians in libraries and information centers. The productivity of a library is intricately linked to the efficacy of information services, the proficiency of workers, the organisational culture, and its capacity for innovation. This study emphasises the significance of knowledge management strategies, such as knowledge production, sharing, acquisition, and use, in enhancing organisational performance and competitive advantage. Nonetheless, a consensus about the optimal knowledge management models for libraries is lacking, and there is insufficient empirical evidence concerning the correlation between knowledge management attributes and librarians' productivity. This literature review examines the significant theories, models, empirical studies, and factor analysis methodologies that underpin the research.

Chicana-Huanca et al. (2022); Cruthaka's (2019) studies established that identifying KM factors is the first step necessary for KM instrument development. Exploratory and confirmatory factor analysis were carried out to validate the structural model. The results revealed that the most influential factors in the application of knowledge is the TAM's perceived ease of use on knowledge sharing and perceived utility. This finding is in line with Gnawali's (2020) investigation that knowledge management practices influence organizational performance in various ways, including knowledgeable employees and improved service offering to clients, which leads to developing a culture of knowledge sharing and improved organizational competitiveness.

Rezaei, Khalilzadeh & Soleimani (2021); Saied et al. (2021); Li et al. (2020) supported that KM practices are positively related to performance. Abdul-Rauf, Jabar & Mansor (2020) extracted eight constructs, including work coordination, communication, information system, knowledge sharing culture, MIS functionality, networking facilities, IT integration, and network capability, using Exploratory Factor Analysis (EFA). These constructs were established as valid and reliable variables to be adopted on research instruments for measuring knowledge management process components. Alijanzadeh, Razavi & Limuni (2020) opined that components of knowledge management have a direct influence on job performance with a predicted strength of over 37.6% for a competitive advantage in organizations.

The implication of the reviewed studies on the current investigation is that the use and application of KM processes should be considered to measure technology experience in knowledge creation, collection, and access to knowledge sharing and transmission and dissemination of knowledge. From the knowledge gaps identified in the literature, the study will use the variables of KM practices for the knowledge value chain, which include: Knowledge Generation/Creation, Knowledge Codification/Storage (capturing tacit knowledge, analysis, and structuring), Knowledge Sharing/Dissemination (right information to the right people), and Knowledge Evaluation as factors that influence productivity. Based on these variables identified in the literature, the study proposes a framework model supporting KM practice for enhancing librarians' productivity

THEORETICAL FRAMEWORK

The study was structured on the variables of the KM process and innovative practices influencing the productivity of librarians. The conceptual framework is related to Rogers' (2003) Innovation Diffusion Theory

(IDT), which was originally Rogers' (1962) Diffusion of Innovation (DOI) Theory. The conceptual model will show the diffusion of innovative KM practices of librarians through adopting new ideas and behavior that will enhance their productivity.

Four KM processes were used to be guided by four constructs of Rogers' (2003) Innovation Diffusion Theory (IDT). These include the variables of knowledge creation characterized as developing new competencies (knowledge, abilities, and skills) and expertise of librarians, to be guided by the "Relative Advantage Construct", which refers to the degree to which a new practice is perceived to be better than the already existing ones. Knowledge codification/storage (capturing tacit knowledge, analysis, and structuring) is to be guided by "Complexity Construct' which refers to the degree to which a practice is perceived to be challenging to comprehend and practice. Knowledge dissemination (the right information to the right people) is to be guided by the "Observability Construct", which stands for the degree to which the outcomes of KM and innovative practices are visible to others. The last KM process is the knowledge evaluation as a factor that influences productivity, which will be guided by the "Trialability Construct", which refers to the degree to which an innovation can be experimented with before adoption.

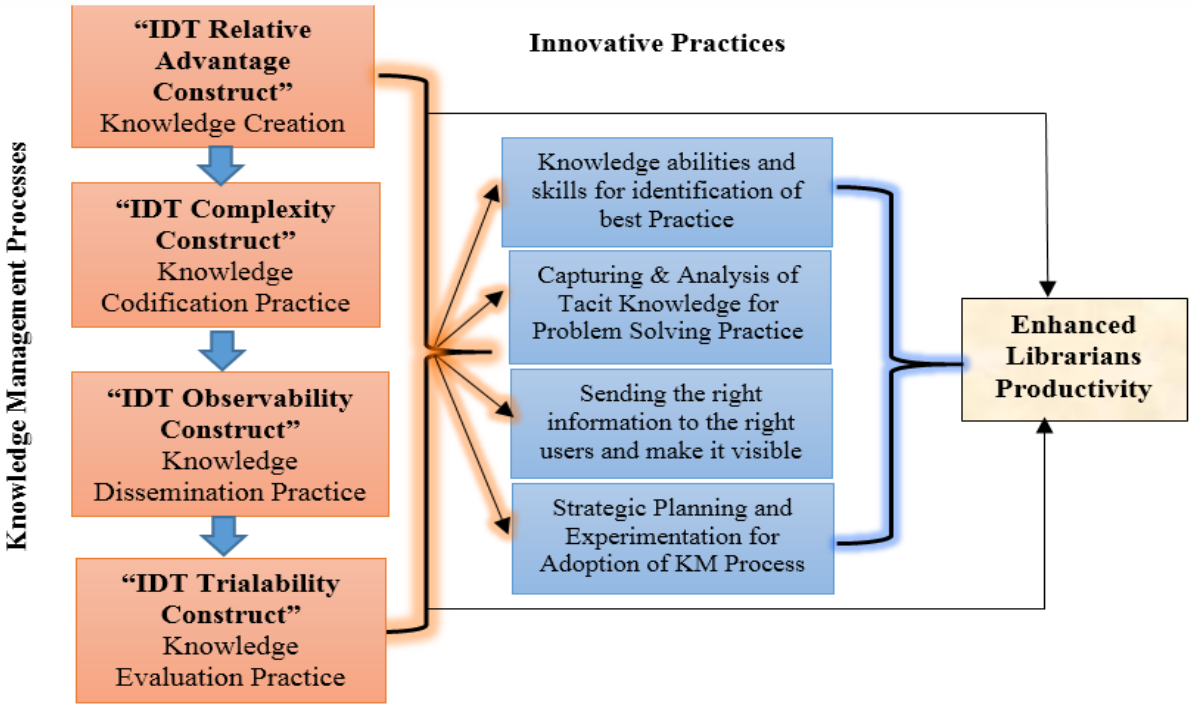

Figure 1: Conceptual Framework of the Study

The study assumed that the productivity of librarians will be enhanced through adopting KM process, which improves librarians' innovation, uniqueness, and competencies that lead to achieving a sound knowledge strategy for overall organizational productivity. However, for deep socialization to occur among librarians, there must be a culture of willingness and readiness to share, which may not be automatic. This model assumes that unless the owner of the knowledge has the culture of knowledge sharing, the idea of deep socialization and externalization of knowledge may not be attained, which ultimately translates into an effective Knowledge Management Process that creates a value chain.

METHODOLOGY

To provide a comprehensive understanding of knowledge management (KM) practices among librarians, the study adopted a concurrent explanatory mixed-methods research design, employing both quantitative and qualitative approaches concurrently. Structured questionnaires were used to gather quantitative data to investigate connections and variables affecting the productivity of librarians and the data collected was analyzed using correlation research design. Qualitative information was acquired through in-depth interviews to supplement the quantitative findings using thematic data analysis technique. The self-administered survey questionnaire and a structured interview instrument were used for data collection.

Questionnaire was instrument used for data collection adapted from studies of Abdul-Rauf, Jabar & and Mansor (2020), modified to fit with the variable scope of the current research. The instrument was pretested in JD Amin Library, Federal University Dutse to for internal consistency, 20 copies of the questionnaire was used and the data collected was computed to obtain the Cronbach's Alpha which revealed an acceptable internal consistency of the items (α = 0.879); KM practice α = 0.870, Innovative practice α = 0.746, and KM productivity α = 0.875 while the Analysis of Variance (ANOVA) revealed P-value is < α (*f* = 101.161, *df* = 206, *p* < 0.001). Three hundred and eighty-four (384) librarians who attended the 60th national conference of the Nigerian Library Association (NLA) held in Abuja from 3rd – 8th July 2022 at Bolton Events Centre Wuse-Abuja, on the Theme: "Library and Information Services in the Development of Nigeria: 1962-2022" were used as the population of the study. Descriptive statistics and measure of dispersion were used to summarize the data and multiple regression analysis was used to analyze the research hypotheses. IBM SPSS Amos was used for the multivariate structural analysis to draw conclusions employing the exploratory factor analysis (EFA) technique to identify latent constructs for theory building and a confirmatory factor analysis (CFA) to assess the goodness-of-fit for the measurement model.

RESULTS

Out of the 384 questionnaires distributed to the respondents, 207 copies were fully filled and found useful for the analysis. The number was enough for running factor analysis to examine underlying factors and their unidimensional attributes (Abdul-Rauf, Jabar & Mansor, 2020; Cruthaka, 2019; Awang, Lim and Zainudin, 2018). Descriptive analysis of research variables includes a basic explanation of the mean and standard deviation of the constructs of the 3 variables (Knowledge Management Processes, Innovative Practices, and Librarians' Productivity).

Response Rate

Since the NLA (2022) Abuja Conference comprises librarians across all different types of libraries in Nigeria, the study analyzed the return rate based on types of libraries to ensure objective generalization.

Table 2: Response Rate

S/No	Libraries of the Respondents	Valid Returned Instrument	%
1	Academic and School Libraries	109	52.66%
2	Special Libraries	32	15.46%
3	Public Libraries	66	31.88%
	Total	**207**	**100.00%**

The results showed that 207 of the 384 questionnaires distributed were filled out and relevant for the analysis of the study. According to types of library distribution of responses, academic and school library librarians participated at the highest rate (109 responses, or 52.66%), followed by public libraries (66 responses, or 31.88%), and special libraries (32 responses, or 15.46%). This suggests that academic librarians participated in the conference and in the study, more actively, perhaps as a result of their greater involvement in knowledge management and research-related activities. The response distribution shows that the data collection comprises viewpoints from the general variety of library environments in Nigeria, which increased the findings' representativeness.

Table 2: Descriptive and Regression Analysis

Coefficients[a]			Unstandardized Coefficients		Standardized Coefficients	T	Sig.
Model	**Mean**	**Std. Deviation**	**B**	**Std. Error**	**Beta**		
(Constant)			.783	.099		7.897	.000
KM Process	4.3982	1.47085	.346	.059	.348	5.899	.001

Innovative Practices	4.3239	1.67134	.542	.052	.620	10.496	.001
N	207						
a. Dependent Variable: Librarians' Productivity							

Out of the 207 valid questionnaires, the independent variables of KM process (KM creation, codification, dissemination, and evaluation) have a mean of 4.39, SD=1.47, innovative practices have a mean of 4.32, SD=1.67 while the dependent variable of librarians' productivity has a mean of 4.64, SD=1.46. This shows that there is a high level of KM practice by librarians, which enhances their productivity. The regression analysis revealed that the knowledge management process (KM creation, codification, dissemination, and evaluation) (β=0.348, t=5.899, r^2=0.909, $p < .01$, N = 207), as well as the innovative practices (community of practice (CoP), institutional repositories, and sharing platforms and technologies) (β=0.620, t=10.496, r^2=0.909, $p < .01$, N = 207), were found to be strongly correlated with librarians' productivity. The correlation coefficient measures and reveals a strong and positive linear relationship between the KM and innovative practices variables on the dependent variable of enhancing librarians' productivity. Ugwu & Ejikeme (2023) supported this finding that knowledge management has a direct influence on organizational culture and significantly contributes to job performance.

The Beta coefficient of the KM process is 0.348, which shows that a 34.8 % change in librarians' productivity is caused by KM practices and the rest by external factors. The Beta coefficient for innovative practices is 0.620, which indicates that 62.0% of changes in librarians' productivity are caused by innovative practices and the rest by external factors. This study found out that librarians' productivity has a significant relationship with the knowledge management process (KM creation, codification, dissemination, and evaluation) and innovative practices such as community of practice (CoP), institutional repositories, and sharing platforms. This finding is in line with Alijanzadeh, Razavi & Limuni (2020), and Gnawali (2020), who revealed that KM practices influence job and organizational performance.

The descriptive analysis revealed the following:

1. The knowledge management process practices by the librarians include: KM creation, KM codification, KM dissemination, and KM evaluation.
2. The librarians engage in innovative practices such as community of practice (CoP), institutional repositories, and sharing platforms which improve their decision-making process, created more efficient problem-solving ways through creative practices.

QUALITATIVE FINDINGS

Twenty-two (22) respondents were purposefully chosen to take part in the qualitative phase based on their expertise and suitability for the study. Deeper understanding of librarians' perspectives towards KM practices in various library settings was made possible by the qualitative responses.

Perception of Librarians towards Implementing KM Process

The qualitative findings revealed that librarians generally perceived Knowledge Management (KM) processes as important for improving information service delivery, enhancing collaboration, and supporting organizational learning in libraries. The responses from the 22 participants were grouped into the following themes:

Theme 1: KM Enhances Service Delivery

Most respondents believed that KM practices improve efficiency in information dissemination and user services. The respondents noted that knowledge sharing among librarians promotes quicker access to institutional knowledge and improves decision-making.

"KM helps librarians to share experiences and improve the quality of services provided to users." (KM_R1)

"Through KM practices, libraries can preserve staff knowledge and reduce duplication of effort." (KM_R4, KM_R12, KM_R13, KM_R14)

"The process improves access to information resources and supports research activities." (KM_R7, KM_R11, KM_R12)

The findings on perception of librarians suggest that librarians recognize KM as a strategic tool for improving productivity and effective information services in Nigerian libraries (Academic, school, special, and public libraries).

Theme 2: Attitude towards Knowledge Sharing

The respondents expressed willingness to collaborate and share professional knowledge with colleagues through meetings and digital platforms.

"Most librarians are willing to share knowledge when there is a supportive environment." (KM_R1, KM_R2, KM_R6, KM_R7, KM_R11, KM_R12)

"Collaboration among staff encourages innovation and learning." (KM_R5 and KM_R8)

"Social media and digital communication tools have strengthened knowledge sharing." (All respondents)

This indicate that librarians maintain positive attitudes towards professional collaboration through the emerging digital technologies.

Theme 3: Innovation and Professional Development

The respondents emphasized that KM processes contribute to creativity and innovation.

"KM exposes librarians to new ideas and how to adopt AI technologies." (KM_R2, KM_R5, KM_R13)

"Training and knowledge exchange improve librarians' competencies." (KM_R9, KM_R22)

Innovative practices in libraries are driven by effective knowledge management." (KM_R12)

This finding implies that KM processes are perceived as mechanisms for enhancing innovative capabilities.

Challenges Associated with the Implementation of KM Technologies

The respondents identified several barriers affecting the successful implementation of KM technologies in Nigerian libraries:

Theme 1: Inadequate ICT Infrastructure

Most participants identified poor technological infrastructure as a major challenge affecting KM implementation.

"Some libraries lack adequate computers, internet facilities, and digital systems." (All respondents)

"Frequent network failure affects the use of KM technologies." (All respondents)

"Limited access to modern ICT facilities slows down knowledge sharing." (KM_R6, KM_R7, KM_R11, KM_R12)

This finding indicates that insufficient ICT infrastructure remains a major obstacle to effective KM practices in libraries.

Theme 2: Inadequate Funding

Respondents explained that inadequate financial support limits the acquisition and maintenance of KM technologies.

"Libraries do not receive enough funds to implement advanced KM systems." (All respondents)

"Management support is sometimes weak in technology-related projects." (KM_R7, KM_R11, KM_R12, KM_R19, KM_R21)

"Budget limitations affect staff training and system upgrades." (All respondents)

The findings demonstrate that financial constraints hinder the sustainability of KM initiatives.

Theme 3: Inadequate Training

The respondents also highlighted insufficient ICT skills and limited training opportunities among librarians.

"There are limited training programs on emerging KM technologies." (All respondents)

"Some librarians lack adequate technical knowledge to operate KM systems." (KM_R2)

"Continuous professional development is needed for effective KM implementation." (All respondents)

This suggests that capacity-building programs are necessary to strengthen librarians' competencies in managing KM technologies.

Theme 4: Resistance to Change

The respondents noted that organizational culture and resistance to technological change negatively affect KM implementation.

"Some staff members are reluctant to adopt new technologies." (KM_R1, KM_R2, KM_R6, KM_R7, KM_R11, KM_R12)

"Traditional work practices sometimes discourage innovation." (All respondents)

The finding implies that organizational resistance affects the successful adoption of KM technologies in libraries.

FACTOR ANALYSIS

The Factor Analysis were performed using SPSS and AMOS statistical software packages. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy with an absolute value of factor loading greater than 0.5 and Bartlett's Test of Sphericity was used to assess the suitability of the data with Promax rotation and enforcing the 40 items grouped under 4-factor of KM practice, innovative practices, predictors of KM practices, influencing KM and innovative practices on improved productivity of librarians to reach a simpler factor structure to test the theoretical structure and instrument development. CFA was then performed to investigate the model's goodness of fit.

The analysis and findings from the EFA suggested that the first four factors have cumulative variance of 92.9% of The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.959, indicating that the sample was adequate. The study conducted a parallel analysis to compare the eigenvalues from the data with those from randomly generated data to determine the number of factors to retain. The analysis used a web-based parallel analysis engine presented by Patil et al. (2017) that calculates eigenvalues from randomly generated correlation matrices.

Table 3: Parallel Analysis

Component or Factor	Randomly Generated Eigenvalues (Patil et al., 2017)	The Study's Eigenvalues
Factor 1	1.825028	15.549
Factor 2	1.710500	7.791
Factor 3	1.621765	4.134
Factor 4	1.547273	2.261

Factor 5	1.483161	.960
Factor 6	1.424142	.165
Factor 7	1.366463	.161
Factor 8	1.313147	.121
Factor 9	1.263967	.095
Factor 10	1.217437	.086

The study's eigenvalue in Factor 1 (15.549), Factor 2 (7.791), Factor 3 (4.134), and Factor 4 (2.261) is significantly greater than the randomly generated eigenvalue of the corresponding factors, confirming the importance of the factors to the study. The study's eigenvalue of Factor 5 (0.960) is less than the randomly generated eigenvalue for the corresponding factors (1.483161), indicating that the remaining factors do not contribute significantly to reducing the number of underlying latent factors (or constructs) as hypothesized by the study and therefore, should not be retained. The four factors were retained for the analysis.

Table 4: Kaiser-Meyer-Olkin Measure of Sampling Adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.960
Bartlett's Test of Sphericity	Approx. Chi-Square	17045.343
	Df	465
	Sig.	.000

The results of the Kaiser-Meyer-Olkin measure the sampling adequacy of the analysis revealed .960 KMO above the threshold value of 0.6 (Collier, 2020; Ullman, 2001), indicating that the sample size adopted by the study (207 respondents) was adequate and suitable for factor analysis.

Table 5: Factor Loading among the Four Variables and their Correlation

Item Codes	Items on the Instrument	Factor 1	Factor 2	Factor 3	Factor 4
Predictor47	Access to Technology and Digital Tools	.993			
Predictor45	Availability of Financial and Infrastructural Resources	.992			
Predictor38	Change Management Support	.990			
Predictor49	Leadership Support and Vision	.988			
Predictor48	Training and Professional Development	.986			
Predictor44	Collaboration and Teamwork.	.986			
Predictor39	Effective Communication Channels	.985			
Predictor43	User-Centered Approach	.981			
Predictor40	Institutional KM Strategy and Policies	.979			
Predictor46	Motivation and Incentives for Innovation	.974			
Predictor37	Cross-Disciplinary Knowledge Integration	.974			
Predictor41	Organizational Culture of Learning and Innovation	.968	**Factor 1: Predictors of KM Practice (12 Items)**		
KM11	Capturing Tacit Knowledge through Mentorship and Collaboration		.986		
KM4	Knowledge Mapping and Expertise Location Systems		.977		
KM17	Content Curation and Personalized Resource Recommendations		.975		
KM18	Implementation of Document and Content Management Systems		.965		

Item Codes	Items on the Instrument	Factor 1	Factor 2	Factor 3	Factor 4
KM6	Knowledge Audits and Gap Analysis		.960		
KM9	Fostering Knowledge Sharing Communities of Practice		.959		
KM12	Knowledge Taxonomy Development and Metadata Standardization		.957		
KM3	Embedded Librarianship in Research Teams		.956		
KM7	Use of Collaborative Wikis and Knowledge Portals		.944		
KM10	Knowledge Sharing through Peer Review and Feedback Loops		.930	**Factor 2: KM Processes (10 Items)**	
Innovate24	Adopting Artificial Intelligence for Personalized Services			.973	
Innovate23	Facilitating Knowledge Transfer through Collaborative Platforms			.972	
Innovate25	Developing and Managing Digital Literacy Programs			.972	
Innovate27	Web Portal Services, Blogging Skills, and Gamification of Literacy Programs			.966	
Innovate22	Knowledge Sharing through Creation of Subject-Based Library Guides	**Factor 3: Innovative Practices (5 Items)**		.964	
Product28	Availability of advanced digital tools facilitates effective KM and innovation, improving librarians' ability to manage and share information				.991
Product33	Continuous learning and openness to change encourages librarians to adopt KM practices and innovative solutions				.989
Product31	Sharing ideas and expertise through teamwork foster innovation and improve the collective performance of library staff				.982
Product32	KM strategies and policies that align with organizational goals encourage the use of KM processes and innovation	**Factor 4: Productivity of Librarians as a Result of Practising KM (4 Items)**			.980
Extraction Method: Principal Axis Factoring. **Rotation Method:** Promax with Kaiser Normalization.					
a. Rotation converged in 6 iterations.					

The relationship between KM processes, creative practices, and librarian productivity is revealed by the pattern mix of the EFA as shown in Table 5. The factor loading matrix reveals underlying patterns that account for the variance in the data by displaying how various items (predictors) cluster under various factors.

Factors including collaboration, leadership support, training, and technological access are among the predictors of knowledge management practices. Factor 1, which represents the primary predictors of knowledge management techniques, is strongly correlated with these items, as indicated by their high factor loadings (above.960). The effectiveness with which KM processes are applied in the library setting is largely determined by these predictors.

Specialized knowledge management practices like content curation, knowledge mapping, and community building are correlated with Factor 2, which represents the major KM processes. The high factor loadings suggest that these processes work together to provide a coherent system for efficiently managing knowledge in a library environment.

Innovative practice factors, adopting artificial intelligence (AI), overseeing digital literacy initiatives, and utilizing subject-based library guides, emphasize the importance of innovation. The loadings in this component imply that these cutting-edge methods are essential for improving the exchange and management of knowledge within the library.

The direct effect of KM and innovative approaches on librarians' productivity is shown in Factor 4, which represents the productivity of librarians. Items such as continuous learning, availability of digital tools, and sharing ideas through teamwork with strong factor loadings suggest that librarians who are innovative perform efficiently with quality of service.

This reflects the real-world interdependence between innovative KM processes and librarians' productivity. Access to technology (Factor 1) can influence innovative practices (Factor 3), and the successful application of these factors results in higher productivity (Factor 4). A strong knowledge management system reinforced by creativity greatly improves the performance of a librarian.

Confirmatory Factor Analysis (CFA) Results

The ratio between $\chi 2$ and degrees of freedom, the comparative fit index (CFI), the goodness-of-fit index (GFI), the root mean square residual (RMR) fit, and the mean square error of approximation (RMSEA) was considered, following the criteria for the goodness of fit proposed by Hair et al. (1998); Barbara & Byrne (2001); Bentler (1995; West et al., 2012).

Table 6: Goodness-of-Fit Indices for Factor Models

Name of Index	Index Full Name	Accepted Fit	Model Indices Value
$\chi 2$/df	Normed chi-square (CMIN/DF)	≤ 3 it indicates an acceptable fit ≤ 5 it indicates a reasonable fit	**1.389**
CFI	Comparative Fit Index	≥ 0,90 indicates an acceptable fit ≥ 0,95 is considered an excellent fit	**0.991**
TLI	Tucker Lewis Index	≥ 0,9 indicates a reasonable fit ≥ 0,95 is considered an excellent fit	**0.990**
PCFI	Comparative Fixed Parsimony Index	PCFI value of 0.6 or higher indicates an acceptable model fit	**0.901**
RMSEA	Root Mean Square Error of Approximation	≤ 0,05 are considered excellent ≤ 0,08 are considered acceptable	**0.043**
PGFI	Parsimony Goodness of Fit Index /	≥ 0.5 indicates a reasonable fit = 1 is considered a perfect fit	**0.832**

The χ^2/df ratio of 1.389 is below the threshold of 3, indicating good fit indices between the observed data and the proposed model. This suggests that the model explains the variance in innovative KM practices effectively without being overly complex. The TLI (Tucker Lewis Index) value of 0.990 also indicates an excellent fit, suggesting that the model is well-specified and reflects the structure of innovative KM practices effectively.

RMSEA (Root Mean Square Error of Approximation) value of 0.043 indicates an excellent fit. This means that the model has minimal approximation error and confirms the appropriateness of the proposed model. All indices in this analysis point to a well-fitting model, suggesting that the proposed model for innovative KM practices in academic libraries effectively captures the key variables and their interrelationships. The confirmatory factor

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analysis results confirm that the proposed model on innovative KM practices is robust and well-aligned with the observed data.

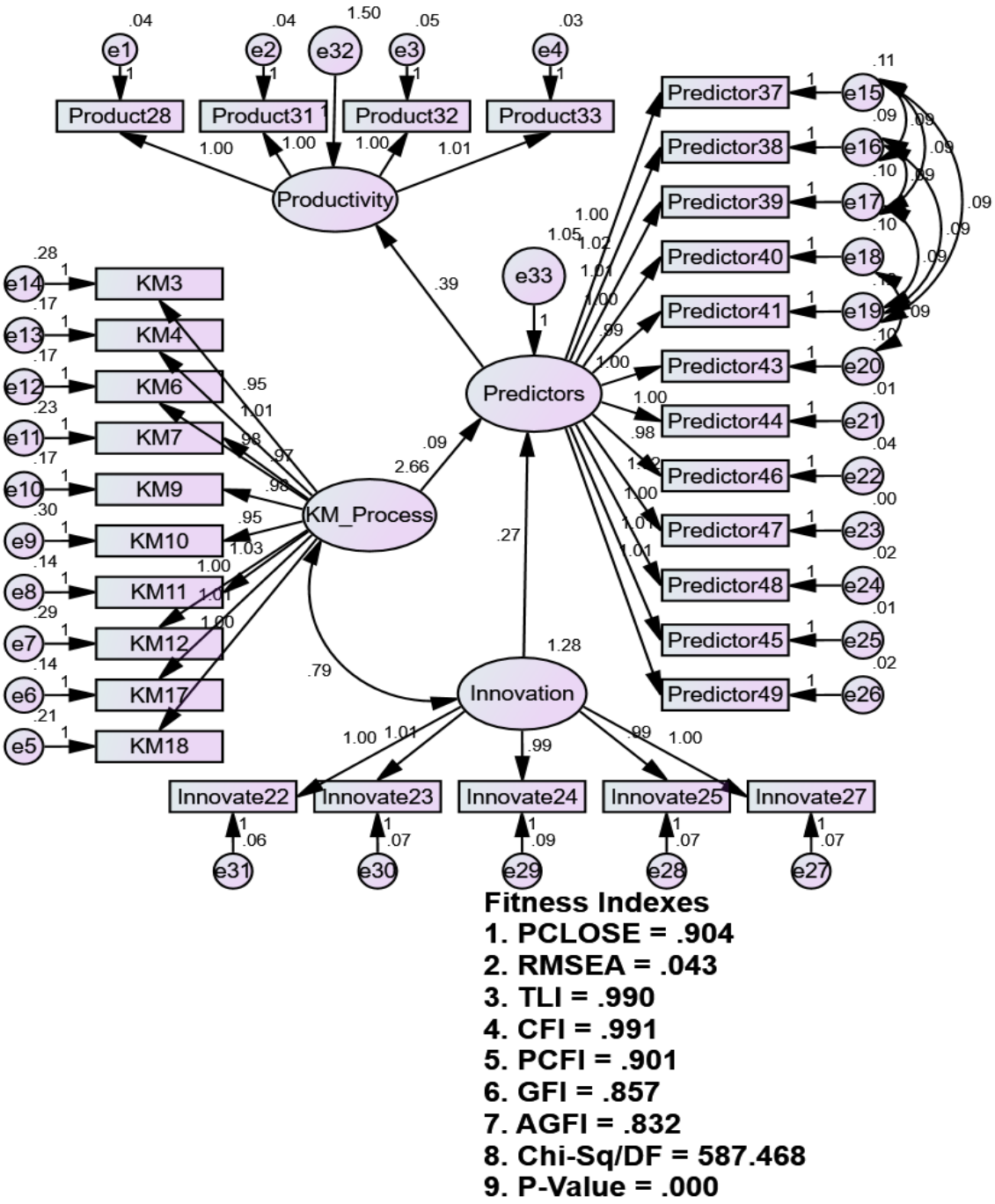

Figure 2: Path Analysis

In line with the findings of the current investigation and the factor analysis, the major innovative KM practices include the following:

1. **Knowledge Sharing through Social-Media and Blogs**: By sharing resources, trends, and advancements in a variety of subjects through blogs, webinars, and social media platforms, librarians promote the diffusion of knowledge outside of the library.

2. **Implementing Cloud-Based and Creation of Subject-Based Library Systems:** The process of converting conventional Integrated Library Systems (ILS) to cloud-based platforms allows patrons and library employees to access library materials and services remotely, improving accessibility. Additionally, it gives users rapid access to important information and resources for study and research needs.

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3. **Facilitating Knowledge Transfer through Collaborative Platforms**: Utilizing institutional intranets, Microsoft Teams, Slack, and other collaborative tools to encourage in-the-moment knowledge exchange and cooperation between library personnel and users.

4. **Developing and Managing Digital Literacy Programs**: To give people the skills they need to navigate the ever-expanding digital information ecosystem, librarians offer training in digital literacy and information literacy.

5. **Adopting Artificial Intelligence for Personalized Services**: providing library patrons with individualized search help, research support, and resource discovery through the use of AI-driven chatbots or other recommended systems.

6. **Data Curation and Research Data Management Services**: providing data curation services that improve the usability and lifespan of academic data for future research, such as organizing, conserving, and making research data available.

7. **Gamification of Information Literacy Programs**: employing gamification strategies to engage users and enhance their information-seeking and knowledge-management abilities, such as interactive modules, quizzes, and prizes.

THE PROPOSED FRAMEWORK

This framework showed that the proposed four factors can enhance librarians' productivity. The findings of the study revealed that knowledge is a fluid mix of regular experiences, values, and conceptual information that provides a framework for evaluation and decision-making. To enhance the provision of the knowledge inventory using strategic objectives, a distinction was made between organizational and shared knowledge. The needed knowledge is then compared with the available knowledge to make clear the 'knowledge gap'. The knowledge gap will be used to identify what knowledge development is needed in the libraries to be shared to create knowledge value. Librarians should familiarize themselves with the available information, experiences, and skills. At the end of each process, an evaluation is required, which will enable knowledge development and possible adjustments.

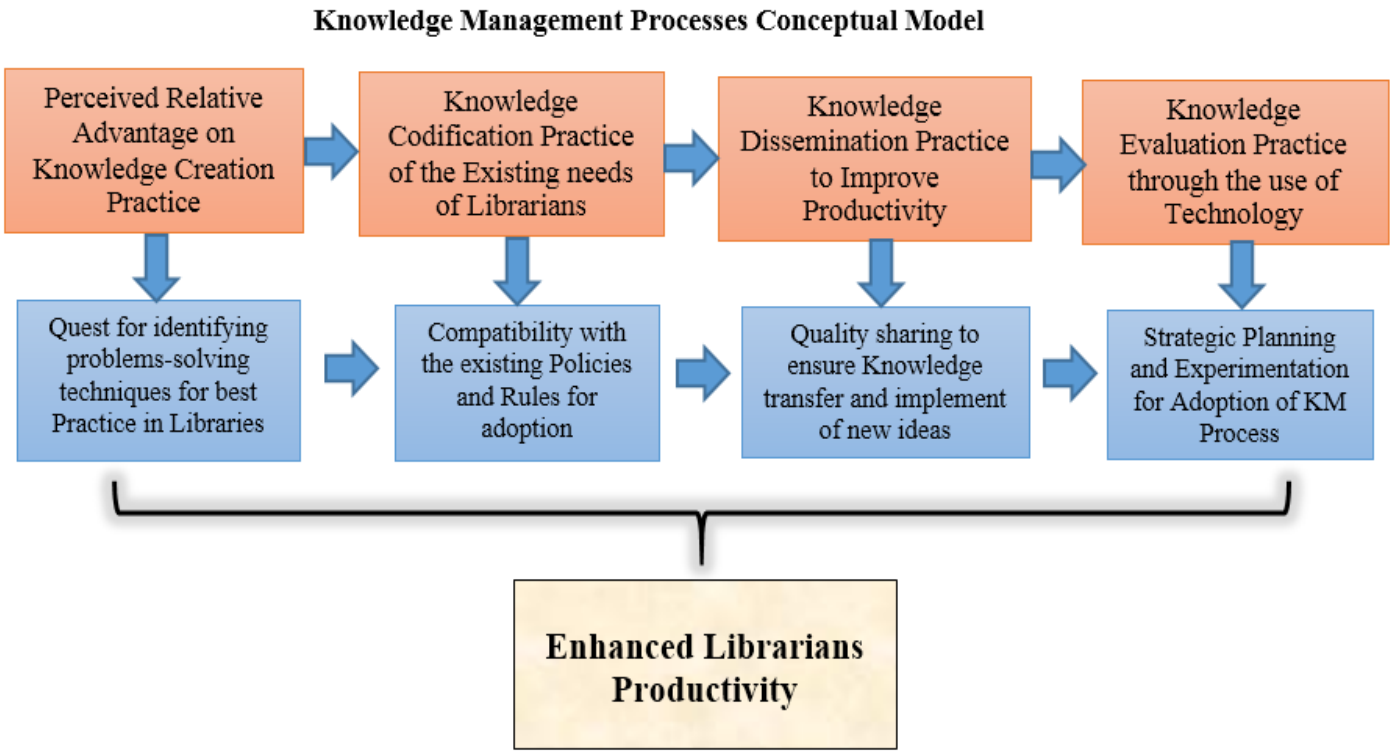

Figure 3: Innovative KM Process Conceptual Framework (Source: The Researchers)

The perceived relative advantage of knowledge creation for solving a practical problem can influence the adoption of the KM process, characterized by the development of new knowledge, abilities, and skills of librarians. The codification of the existing values, needs, and experiences of librarians to ensure their compatibility with the existing policies or rules in the library influences the processes and practices of KM in libraries. The dissemination process, as the outcomes of these innovations improve productivity and librarians' performance, while knowledge evaluation is a factor that influences productivity, which can be experimented with the use of technological advancements. This framework provides an all-inclusive understanding of the adoption of KM and innovative practices in Nigerian libraries.

PRACTICAL IMPLICATIONS

Factor analysis is used to answer research questions involving direct or indirect observation of one or more independent variables to validate the cause-and-effect relationship. Therefore, the findings improve the understanding of innovative and KM practices and align them to improvement in the productivity of librarians, thus contributing to the existing literature. The study confirmed that organizational structure must be sufficiently flexible and dynamic, so that communication is not limited to a team or departmental boundaries, but rather penetrates the outside environment. These relationships will inform library administration, innovators, and project managers about the appropriate investment in KM practices in their daily transactions.

The study explores constructs for the development of KM research instruments from the library's perspective. This presents a practical implication for KM researchers in the library domain to pretest the instrument for validation. Innovative capabilities and knowledge management practice capabilities, when coherently aligned, will allow librarians and other information practitioners to have cohesive strategies, optimize information resource utilization, avoid redundancy of effort, and improve access to highly scarce and skilled IT. The identified variables have the latent to serve as the basis for establishing perceptions of assessment strategies and informing KM practices and policies which maximize these capacities in extension services.

THEORETICAL IMPLICATIONS

The findings conceptualize dimensions of knowledge management via social interaction. While various studies have been conducted to analyze the KM capacity networks, the current study introduces exploratory results for KM instruments and model development to discretely quantify perceptions of KM and innovative practice capacity in libraries in Nigeria

LIMITATIONS FOR FURTHER STUDIES

Although the sample size adopted by the study was acceptable, the potential bias existed of not including all categories of librarians, which was a possibility to limitation of the study. This research was conducted at a specific time frame during a conference, which may yield different results at other times since other settings might have different cultures and structures; thus, its generalizability is limited to other similar contexts.

CONCLUSIONS AND RECOMMENDATIONS

This study aimed to explore the influence of the knowledge management process and innovative practice on the productivity of librarians. Knowledge Management is seen as a multifaceted area that functions as a tool for identifying appropriate solutions to organizational problems from an available pool of knowledge items. Especially for libraries that must create and manage vast knowledge resources, different categories of users, and a competitive IT environment. The findings from this study developed a KM research instrument within the library context, which will address the shortcomings of the lack of a comprehensive instrument for conducting the KM process and innovative practice research within the library context.

The study concludes that organizational resistance affects the successful adoption of KM technologies in Nigerian libraries. It also concludes that librarians have positive perceptions towards the implementation of KM processes. However, the implementation of KM technologies in Nigerian libraries is constrained by inadequate ICT infrastructure, insufficient funding, and resistance to change.

The proposed framework can enhance the performance of librarians significantly through well-planned innovative KM research in generating and implementing new empirical ideas. Thus, KM practice is an important mechanism for increasing the productivity of librarians and increasing the effectiveness of libraries in the era of rapid technological development. Libraries with vibrant knowledge management strategies can achieve better administrative capacity and the adaptation of technical skills to increase productivity and organize human resources to strengthen connections with innovation.

The following are recommendations arising from the study:

1. Improve the capabilities of KM practice through the involvement of library management and strengthen organizational culture for a transformative change management.
2. library management should champion the implementation of innovative KM practices to enhance librarians' productivity
3. KM practice should be aligned with the appropriate innovative practices, using their order of importance to prioritize implementation.
4. Further research should be conducted to test the proposed Innovative KM Process Conceptual Framework in different library settings to evaluate its practical applicability and effectiveness.

Conflicts Of Interest

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