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The Role Of Knowledge Management In Curriculum Development Among Higher Education Institutions.

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Abstract:
In the dynamic landscape of education, Knowledge Management (KM) has become a transformative force, reshaping educational systems for greater efficiency and foresight. This study focuses on the role of KM in Higher Educational Institutions (HEIs), specifically addressing the impact of knowledge creation, storage, sharing, analyses, and application on curriculum development. The research employs a quantitative approach, utilizing a questionnaire-based survey with a sample of 300 teaching staff from three prominent Indian universities. The study establishes a conceptual model based on Zack's KM Model, testing the relationships between KM practices and curriculum development. Results indicate significant positive relationships, emphasizing the crucial role of KM in shaping effective curriculum development. The study recommends a dynamic approach to curriculum design, aligning with the evolving KM landscape within educational institutions.

Keywords: *Knowledge Management, Curriculum Development, Higher Education Institutions, Knowledge Creation, Knowledge Storage, Knowledge Sharing, Knowledge Analyses, Knowledge Application, Smart PLS.*

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I. Introduction:

In this continuously evolving world, Knowledge management has revolutionized the education systems. As modern education system is much more efficiency-oriented and planned than in past times. Continuous efforts are needed to look forward to futuristic transitions, present scenarios, and past experiences. This will set the base for a need-oriented knowledge management system that could adhere to the sustainability of Higher Educational Institutions. Enkhbaigali (2004) defines knowledge management as "deliberate measures undertaken to better manage an organization's resources to improve its performance." For any educational institution, some areas of work in which performance is sought include the achievements of their students and sometimes the economic well-being of the institution as well. The current study is focused on the teaching aspect, which leads to students' achievements in educational Institutions.

According to Lau and Al-Hawamdeh (2002), "Curriculum development poses many challenges and one among these is determining the ideal combination of courses from multiple disciplines that best achieves the goal of developing the necessary professional capabilities of knowledge professionals." Because organizational knowledge management is a new profession, some educational experts contend that incorporating it into education is a novel idea and practice rather than a standard practice. As a result, there have been few studies and conversations regarding how to strategically employ knowledge management in educational institutions and universities to enhance organizational practice, curriculum implementation, and the teaching and learning process (Fullan, 2001). The scenario is the same in the Indian educational sector.

II. Literature Review:

Knowledge Creation: The very first stage in the Knowledge management process is creating the required knowledge. It can be done out of research, experimenting, and satisfying the old knowledge to current or future considerations. Universities and educational institutions are continuously producing new information by the means of their students and experts (Thani & Mirkamali, 2018; Eraut, 1985). All of this information goes through a lot of scrutinizing and synthesizing so as to get the desired and relevant knowledge. Although there are many other focused institutions like research stations and laboratories which are actively and keenly focused towards creating knowledge (Metaxiotis & Psarras, 2003). Without creating knowledge, the whole knowledge system will fail to grow as well as sustain it as it will ultimately obsolete (Metaxiotis & Psarras, 2003). So, it is one necessary and pioneer stage of the process of Knowledge Management.

Knowledge Storage: Keeping knowledge in its true form is always challenging as knowledge storage has seen a great shift from contemporary means to advanced digital databases (Biasutti, & Heba, 2012). The gradual shift has made it possible for institutions to shift their offline databases to digital and virtual grounds so that the lifespan of knowledge storage can be increased (Eraut, 1985). Multiple methods and tools from offline digital databases to virtual online databases are used to store the knowledge for futuristic uses (Eid, & Al-Jabri, 2016).

Knowledge Sharing: It can be denoted as communicating and commuting knowledge and knowledge resources to people within and beyond any boundaries (Farrukh et al., 2019). Sharing knowledge is one of the prime tasks of educational institutions as they are basically obliged to teach students Al-Kurdi, El-Haddadeh, & Eldabi, 2018; Sohail, & Daud, 2009). Modern institutions are aligned towards spreading knowledge beyond their geographical boundaries so that more and more of the pupils could be enlightened. Some methods of facilitating include having online classrooms, Online libraries, ERP systems, Database management systems (DBMS), etc. (Annansingh et.al., 2018).

Knowledge Analyses: The future is always uncertain and it brings forward the numerous opportunities and challenges which are directly associated with the scenarios. Thus, the information and knowledge base also evolve with the changes in scenarios, if not then it becomes history (García & de Figuerola Jose, 2010). Henceforth, managing knowledge demands continuous and rigorous analyses so that the required updates and alterations can be made to make the knowledge base updated and prevalent regarding the current and future implications (Rowley, 2000). Educational Institutions are one of the building blocks of any system as they are the primary human resource builders. Equipping the upcoming generations with the olden knowledge and skills will not do any good to them but withhold serious intricacies towards their professional life as well as towards the world's economy as well (García & de Figuerola Jose, 2010). Hence, they need to continuously analyze and assess their current knowledge bases to make the future-oriented.

Knowledge Application: Here begins the fun part, where all the created, stored and analyzed knowledge is put into application. Knowledge is one of the vital resources for any institution, and for an organization to perform effectively, it is a must that they are making use of all of their resources to the fullest. In educational institutions, the product is knowledge and for any institution to be efficient it should be effectively applying and making use of its knowledge base (Songsangyos, 2012). Although all of the

Knowledge Management: Altogether, they all constitute a centralized phenomenon i.e., Knowledge Management, which is depicted as the overall measures taken to create analyses, store, share and apply the knowledge to achieve the final goals of the organization. Knowledge management is vital, hence cannot be neglected (Zack, McKeen, & Singh, 2009). So, the focus of institutions is not on knowledge management but its effective and efficient management (Songsangyos, 2012). Several tools and software like Database Management Systems, Enterprise resource planning systems, Learning Management Systems, etc. are put to use so as to effectively manage the knowledge flow in the institution (Laal, 2011).

Hypotheses Development:

To test the impact and role of different knowledge management practices in the curriculum development process, the following hypotheses were developed:

H1	Knowledge Creation has a significant positive role in Knowledge Management.
H2	Knowledge Storage has a significant positive role in Knowledge Management.
H3	Knowledge Sharing has a significant positive role in Knowledge Management.
H4	Knowledge Analyses have a significant positive role in Knowledge Management.
H5	Knowledge Application has a significant positive role in Knowledge Management.
H6	Knowledge Management has a significant positive role in Curriculum Development.

Conceptual Model Building:

Knowledge Management at the universities is done through following several practices namely Knowledge creation, Knowledge Storage, Knowledge Sharing, Knowledge Analyses, and knowledge Application, which are tested in the first order of the model where all of these five exogenous are tested for their role upon endogenous variable Knowledge Management among universities which is adopted from the Zack's Knowledge Management Model (Zack, McKeen, & Singh, 2009). While in the second-order construct of the model, the exogenous variable is Knowledge management which is tested against the endogenous variable Curriculum Development. Hence, fig 2.1 depicts the conceptual model for the study.

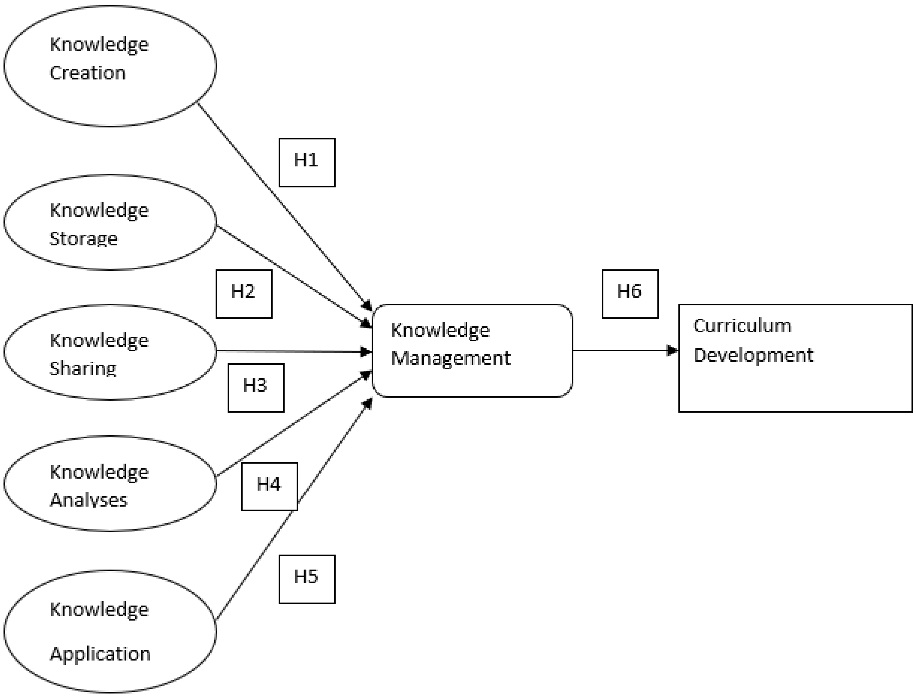

Figure 1: Conceptual Model

III. Methodology:

Research Design:

Quantitative methods were used for the study to measure the role of knowledge management in curriculum development among universities. Data was collected using a questionnaire-based out on a 5-point Likert scale. The quantitative method is described as one way of running a mathematical approach to data collection and analysis. As the result, the quantitative approach was applied to achieve the objectives to test factors influencing students (Aliaga and Gunderson, 2000). Two phased conceptual models were drawn out to understand the influence of five knowledge management practices on combined effect being endogenous variable i.e., Knowledge Management. However, in the second stage, the role of Knowledge management is measured in the process of curriculum development among the universities.

Sample and Survey:

Data were collected using the questionnaire survey method from the time period September 2021 to March 2022 using online (Google forms) as well as offline means. A sample of 300 respondents was selected from the teaching staff of three prominent universities of India were selected from which one was a private university i.e., Lovely Professional University, Jalandhar with a faculty size of 1020; the second was Public University i.e., Punjabi University, Patiala with the faculty size of 492; and last was deemed to be a university i.e., Thapar University, Patiala with the faculty size of 384. Structured Equation Modelling (SEM) using the Smart PLS 14 software was used to analyze the data in order to find the role and relationship among the exogenous and endogenous variables.

IV. Result/Findings:

Reliability:

Cronbach's Alpha, a measure of internal consistency, Composite reliability (rho a), Composite reliability (rho c), and Average variance extracted (AVE) values were computed and displayed in Table 2.1 to examine Construct reliability. Cronbach's Alpha greater than 0.7 is considered acceptable for any construct, and the value of Cronbach's Alpha for all constructs, namely Knowledge Creation (KC), Knowledge Storage (KST), Knowledge Sharing (KSR), Knowledge Analyses (KA), Knowledge Application (KAPP), Knowledge Management (KM), and Curriculum Development, came out to be greater than 0.7 (Henseler et al., 2014), indicating that all seven constructs are reliable according to Cronbach's Alpha.

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Curriculum Development	0.842	0.845	0.881	0.515
Knowledge Analyses	0.809	0.811	0.863	0.512
Knowledge Application	0.808	0.810	0.862	0.511
Knowledge Creation	0.810	0.811	0.863	0.513
Knowledge Management	0.925	0.926	0.944	0.770
Knowledge Sharing	0.803	0.806	0.859	0.504
Knowledge Storage	0.807	0.809	0.861	0.509

Table 1: Reliability of data (Smart PLS-4 output).

Validity:

Values of Composite reliability (rho a) and Composite reliability (rho c) were also computed, and all of the values came out higher than the allowed limit of 0.7, implying that the standards of composite reliability are likewise satisfied for all of the constructs. However, to measure the convergent reliability, the values of Average variance extracted (AVE) are computed for all seven constructs, and for any construct to meet the requirements of convergent validity the values of AVE should be more than 0.5, which is clearly passed by the seven constructs (Henseler et al., 2014; Hair et al., 2017).

The HTMT values were computed to examine the data's discriminant validity, or how effectively the constructs can measure the concept. Although there are numerous techniques to compute discriminate validity HTMT values were picked for the current study as they are the better and newer approach than the Fornell-Larcker criterion, which does the calculations based on the multitrait-multimethod matrix (Henseler, Ringle, and Sarstedt, 2015). The HTMT value must be less than 0.9 in order to have the requisite discriminant validity (Hair et al., 2014; Henseler, Ringle, and Sarstedt, 2015). As a result, the computed HTMT values of the construct are smaller than the needed value of 0.9, which meets the criterion for valid HTMT values and hence displays the requisite discriminant validity of the data.

	Curriculum Development	Knowledge Analyses	Knowledge Application	Knowledge Creation	Knowledge Management	Knowledge Sharing	Knowledge Storage
Curriculum Development	0	0	0	0	0	0	0
Knowledge Analyses	**0.860**	0	0	0	0	0	0
Knowledge Application	0.753	**0.874**	0	0	0	0	0
Knowledge Creation	0.659	0.763	0.697	0	0	0	0
Knowledge Management	**0.852**	**0.826**	0.545	0.746	0	0	0
Knowledge Sharing	0.754	0.663	0.701	0.676	0.545	0	0
Knowledge Storage	0.642	0.755	0.578	0.601	0.525	0.808	0

Table 2: Heterotrait-monotrait ratio (HTMT) – Matrix (Smart PLS-4 output)

Model Testing:

Further, the model is tested for its fitness and ability to measure the construct, using the PLS-SEM Algorithm, where the values of Standardised Root Mean Square Residual (SRMR), Chi-Square, and Normed Fit Index (NFI) were computed and presented over in Table 2.5. According to Lohmöller (1989), in order for a model to be a good fit, it must represent the NFI value to be greater than the minimum threshold value of 0.9, as it provides a much clear picture rather than the implicative one being presented by the chi-square value (Hair et al., 2017; Hu and Bentler, 1998). So, from Table 2.5 it can be seen that the computed NFI value for the model is 0.919 which is greater than the minimum threshold level of 0.9 describing a good model fitness.

	Estimated model
SRMR	0.052
d_ULS	2.413
d_G	2.498
Chi-square	2777.569
NFI	0.919

Table 3: Model Fit Statistics (Smart PLS-4 output)

However, for the Standardised Root Mean Square Residual (SRMR) value the model should have a value of <0.5 to be the great fit while a value of <0.8 represents the good fit. From above Table 2.5, it can be seen that the Standardised Root Mean Square Residual (SRMR) value of the model is 0.052 which lies in the range of <0.8 proving the model to be a good fit (Hu and Bentler, 1998; Hair et al., 2017). Hence the model fitness is tested and proven positive, which means that the model could be tested for further computations.

Final Results:

Smart PLS Bootstrapping was run using Smart PLS 14 software so as to test the hypotheses by comprehending the path coefficients, and T statistics alongside the P values for the different relationships made between the constructs in the estimated model to be tested. Where path coefficients denote the direct effect of the variable onto the other variable so as to understand the relationship among them. Whereas T- Statistic and p values denote the significance of the relationship in the estimated model. If the value of the t statistic is > 1.96 the relationship is said to be significant and we tend to reject the null hypotheses and select the alternative hypotheses stating the significant relationship (Hair et al., 2014).

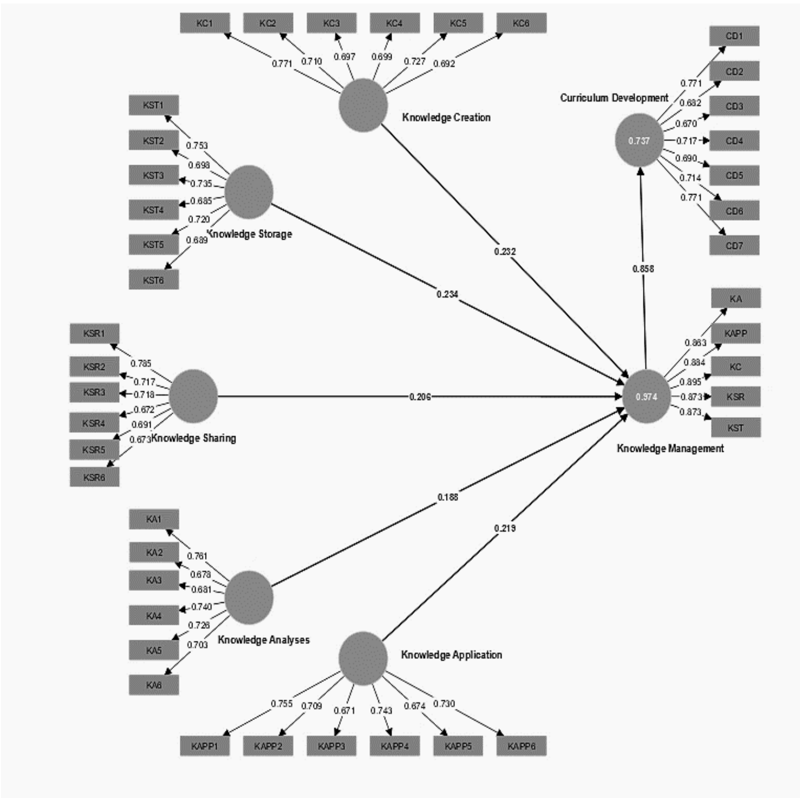

Figure 2: Calculated Model (Smart PLS-4 output)

However, p-values can be analysed to check the intensity of the significance as well if the p-value <0.10 the relationship among variables is said to be significant if the p-value <0.05 the construct denotes a strong relationship among them where as if the p<0.01 the relationship among the constructs is said to be highly significant. Hence the above-sated model in Fig 5.1 is tested against the following hypotheses to check for significant interrelationships.

Hypothesis	Path	Path Coefficient	T statistics (|O/STDEV|)	P values	Hypotheses Decision
H1	Knowledge Creation -> Knowledge Management	0.232	12.239	0.000***	Accepted
H2	Knowledge Storage -> Knowledge Management	0.234	11.954	0.000***	Accepted
H3	Knowledge Sharing -> Knowledge Management	0.206	10.087	0.000***	Accepted
H4	Knowledge Analyses -> Knowledge Management	0.188	10.875	0.000***	Accepted
H5	Knowledge Application -> Knowledge Management	0.219	11.103	0.000***	Accepted

H6	Knowledge Management -> Curriculum Development	0.858	59.210	0.000***	Accepted

*p<0.10,**p<0.05, ***p<0.01

Table 4: Significance Testing Results of the Structural Model Path Coefficients

Knowledge Creation:
H1: Knowledge Creation has a significant positive role in Knowledge Management.

The path coefficients, T statistic, and p-value are used to test the interrelationship between knowledge generation and knowledge management. To examine the influence of knowledge production on knowledge management, the Path coefficient, also known as the Beta value, was calculated, and it came out to be 0.232, indicating that there is a 23% positive relationship between knowledge creation and knowledge management. Furthermore, the significance of the link was checked by computing the value of the T statistic, which came out to be 12.239, which is greater than 1.96, indicating that the relationship is significant. The computed p-value of 0.000, on the other hand, falls into the highly significant category and demonstrates the considerable association between the two-knowledge generation and knowledge management (Henseler et al., 2014; Hair et al., 2017). As a result, Hypothesis H1 was accepted, and the large positive influence of knowledge production on knowledge management in universities was demonstrated (Zack, McKeen, & Singh, 2009; Metaxiotis & Psarras, 2003).

Knowledge Storage:
H2: Knowledge Storage has a significant positive role in Knowledge Management.

To test the interrelationship between Knowledge storage and Knowledge Management, the path coefficient was calculated to be 0.234, indicating that Knowledge storage has a positive 23.4% effect on Knowledge management, which is good and within the acceptable range of -1 to 1, whereas the significance of the relationship is tested with the help of the T statistic (ideally should be >1.96), and the computed value for the T statistic came out to be 11.954, which is greater than 1.96, indicating that Knowledge storage (Henseler et al., 2014; Hair et al., 2017). However, the significance of information storage in knowledge management is quantified using P values, which came out to be 0.000, indicating a very significant link (Zack, McKeen, & Singh, 2009). As a result, knowledge storage plays a key beneficial function in university knowledge management.

Knowledge Sharing:
H3: Knowledge Sharing has a significant positive role in Knowledge Management.

In order to test the role of knowledge sharing in knowledge management among Indian universities, the path coefficients were computed, as shown in Table 2.7. The path coefficient value between knowledge sharing and knowledge management is 0.206, indicating that knowledge sharing has a 20% positive effect on knowledge management. To assess the association's additional significance, the T statistics and p-value were computed, and Table 2.7 shows that the T statistic was 10.087, which is greater than the minimal threshold value of 1.96, confirming the link to be significant (Henseler et al., 2014; Hair et al., 2017). While testing the role of knowledge sharing in knowledge management, the p-value was computed and found to be highly significant, i.e. 0.00, as shown in Table 2.7. As a result, Hypothesis H3 is accepted, and the significant role of knowledge sharing in knowledge management is demonstrated by the data (Zack, McKeen, & Singh, 2009).

Knowledge Analyses:
H4: Knowledge Analyses have a significant positive role in Knowledge Management.

The next step is to determine if Knowledge Analyses play a significant role in knowledge management among colleges. The value of the path coefficient was 0.188, demonstrating a positive 19% effect of knowledge Analyses on knowledge management, whereas the value of the t statistic was 10.875, which is greater than the minimum threshold value of 1.96, demonstrating a significant relationship between knowledge Analyses and knowledge management (Henseler et al., 2014; Hair et al., 2017). However, the computed p-value was 0.000, indicating a highly significant p-value highlighting the important importance of Knowledge Analyses in Knowledge Management across universities and leading to acceptance of hypothesis H4 (Zack, McKeen, & Singh, 2009).

Knowledge Application:
H5: Knowledge Application has a significant positive role in Knowledge Management.

Finally, the knowledge management model across institutions was tested by examining the link between Knowledge Application and Knowledge Management. The computed path coefficient value for the path flowing from Knowledge Application to Knowledge Management was 0.219 (Fig 2.2), indicating that Knowledge Application has a positive influence on Knowledge Management by 22%. Furthermore, the estimated value for T Statistic was 11.103, which is larger than the minimum needed value of 1.96, demonstrating the significance of the association. The p-value was also calculated, and it came out to be 0.000, demonstrating the critical importance of Knowledge Application in knowledge management across institutions (Henseler et al., 2014; Hair et al., 2017). As a result, Hypothesis H5 is likewise accepted (Zack, McKeen, & Singh, 2009).

Knowledge Management:

H6: Knowledge Management has a significant positive role in Curriculum Development.

The impact of overall knowledge management on curriculum development at universities is quantified using the second-order construct, which is tested using Smart PLS 14 software to provide values for the path coefficient, T statistic, and p-value. After conducting Bootstrapping, the path coefficient was 0.858, demonstrating that Knowledge Management in universities has a strong positive influence of roughly 86% on curriculum development in universities. The significance of the association was assessed using the T statistics value, which was 59.210, which is pretty excellent and more than the minimum threshold value of 1.96. Furthermore, the p-value was computed to measure the intensity of the significance of the association, which came out to be 0.000, describing a very significant link (Henseler et al., 2014; Hair et al., 2017). As a result, hypothesis H6 may be accepted (Songsangyos, 2012), and it can be concluded that Knowledge Management plays an important beneficial role in university curriculum creation.

V. Limitations and suggestions for further research:

The current research is limited to measuring the roles of several knowledge management practices in the curriculum development in the universities in one state of the country only. Henceforth, future studies can consider taking up the data from different universities and from different states. Furthermore, the sample size of future studies can also be increased to take enhance the generalisability of the results. Moving on to the conceptual limitations the current study is limited to measuring the role and impact of knowledge management practices on the curriculum development process in the universities. However, other aspects like satisfaction levels and perception of faculty members can be included to get a comprehensive idea about the different factors impacting curriculum development and their respective impact.

VI. Conclusion and recommendations:

From the systematic analyses of the data, it can be concluded that Knowledge management plays a significant positive role in curriculum development among higher educational institutions. However, from the analyses, it was proved that Knowledge management in any educational institution can be constituted of five major practices Knowledge Creation, Knowledge Storage, Knowledge Sharing, Knowledge Analyses, and Knowledge Application. Because, higher education institutions are involved in knowledge generation, dissemination, and learning, hence they are considered to be in the knowledge business (Rowley, 2000).

After analyses of the results of the study following recommendations could be made. Curriculum development in universities should be conducted by taking into consideration the current knowledge management scenario of the university and the current level of knowledge management practices being followed by the university, rather going vice versa. Another thing to be taken into conservation is that as the knowledge management scenario among educational institutions is continuously evolving with respect to the different technological and other environmental factors henceforth the curriculum of the institutions should also be revised after set intervals of time like every 5 years or 10 years so that the curriculum of the institutions is in line with the knowledge management practice being followed by that institution.

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