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The Role of Digitalisation in Knowledge Management Among Higher Education Administrative Staff

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Abstract

The current study analyses the role of digitalization on knowledge management within administrative personnel of higher education institutions. The paper is based on the final year research project and the Python-based analysis prepared from the cleaned survey dataset. The study uses a final analytical sample of 201 respondents and tests three core relationships: the effect of digital knowledge management systems on administrative efficiency, the role of digital knowledge management and regular training in improving morale and performance, and the influence of digital communication and collaboration on knowledge-sharing practices. Results reveal that digitalization has a positive impact on administrative tasks. In regard to Hypothesis 1, the relationship between the two variables was measured using Pearson correlation (0.275) and Spearman correlation (0.392), which shows that good digital knowledge management leads to effective administration. Hypothesis 2 emerged as the strongest relationship, with Pearson and Spearman values of 0.323 and 0.388, showing that training and organisational support strengthen morale and work performance. Hypothesis 3 also showed a positive relationship, with Pearson and Spearman values of 0.183 and 0.250, but the result must be interpreted with caution because the communication-collaboration construct had low reliability with Cronbach's alpha of 0.299. According to the current paper, digitalisation is believed to have a positive impact on the accessibility and continuity of knowledge management. However, at the same time, the level of training, technical support, and documentation will determine the extent of its implementation.

Keywords: Digitalisation, Knowledge Management, Higher Education Administration, Administrative Efficiency, Staff Training, Communication and Collaboration

1. Introduction

Knowledge management has been a significant administrative issue in organizations working within information-intensive contexts. Educational institutions require constant flows of documentation, communications, approvals, scheduling, student data, financial statements, and process-related information. In situations where knowledge stays distributed among individuals, hard-copy files, or different digital technologies, the administrative processes become slower, prone to mistakes, and overly reliant on a small number of employees who are well-versed in their jobs. This is why the issue of digitalization becomes critical for higher education administration, which requires timely and accurate processing of everyday activities.

The digitalisation process has changed the process of creating, storing, accessing and disseminating knowledge through departments. The use of shared drives, enterprise solutions, Google Workspace tools, communication channels and digital documents has lowered reliance on physical storage, and at the same time has expanded access to information

throughout organizational environments. This is critical in administrative environments, where most of the time decisions need to be made urgently, and require access to accurate information. When the relevant information can be accessed easily, administrative activities become easier, and continuity is maintained regardless of changes within personnel.

This paper derives from the final year research project concerning the impact of digitalisation on knowledge management within higher education administrative personnel. This paper seeks to examine whether digital knowledge management enhances administrative efficiency, employee morale, and knowledge-sharing processes. Also, this paper will explore whether communication using digital means can become a medium for collaboration and institutional learning. The focus of this paper shall remain on higher education administrative personnel as this category of employees always handles process knowledge required for institutional sustainability.

The theory behind this paper will focus on knowledge management, organizational learning, and digital transformation theories. Knowledge management should not only be viewed as a means of storing information, but it should be regarded as a process of extracting, sharing, and utilising information. Organisational learning explains how organisations store and utilise experience gained, whereas digital transformation explains how technological shifts affect workflow and communication. Knowledge management, organisational learning, and digital transformation offer a fitting perspective for analysing administrative functions within higher education institutions, where digitalisation should help in documenting formal knowledge and applying informal knowledge (Gavrilova, 2018) [1], (Mårtensson, 2000) [2], (Nonaka and Takeuchi, 1995) [3].

The objective of the present paper includes two aspects. Firstly, the paper aims to translate the findings of the thesis into a research paper form. Secondly, the paper provides a presentation of the key findings in such a way that the information can be used for academic presentation and discussion in particular, concerning the three hypotheses tested using the data analyzed with the help of Python.

2. Review of Literature

In the existing literature review, it can be seen that knowledge management has evolved from an approach to the preservation of knowledge towards understanding the value generation through knowledge management. Gavrilova pointed out that modern knowledge management assumes that institutions need to produce, preserve, share and utilise knowledge in a manner that would lead to the increase in the value added and decision-making processes [1].

Knowledge management was described by Mårtensson as a multidimensional process where technology, humans and organisation processes interact with one another. The importance of this theory in relation to administration in higher education institutions lies in the assumption that not only technological tools but also the understanding of how to apply these tools is important for providing services. In the same vein, Nonaka and Takeuchi made a distinction between explicit knowledge and tacit knowledge. While the former could be captured in manuals, circulars, procedures and digital data storage, the latter is rooted in experience. In office administration, a large part of work still revolves around tacit knowledge and its digitalisation and transfer become especially important.

Scholarship on universities and other higher education establishments has found that digital knowledge management systems are particularly important in cases where administrative tasks are spread across different units. Faldesiani pointed out that universities and colleges consist of various knowledge areas, and the effective functioning of the institution requires the coordination of these areas. With the help of process documentation and digitization, institutions can reduce their reliance on informal methods and individual knowledge [4]. In his research, Vyas stressed that the effectiveness of administrative activity increases when repetitive processes are documented and utilized throughout cycles [5].

Moreover, research about the use of digital technology indicates the need for enabling factors. As indicated by Garg and Kumar, there is usually a lot of investment in the deployment of the technology in institutions, yet little consideration is taken into account when it comes to creating commitment and training of leaders concerning the process of digitalisation. In addition, Ihejirika and Chauhan and Thangavelu state that the deployment of technology is normally restricted due to the absence of training, lack of skills, poor infrastructure, and cultural resistance [6], [7], [8].

Thus, it is evident that the use of digitalisation can improve access, efficiency, and cooperation; however, its effectiveness will be dependent on how well the system is interconnected with capability and institutional support. This paper has been built on the literature review, where three hypotheses about efficiency, motivation, and performance, and information sharing through communication amongst the administrative personnel at higher educational institutions have been formulated [4], [6], [9].

3. Objectives of the Study and Hypotheses

The research was anchored on the overall goal of examining the contribution of digitalisation towards knowledge management within the administrative officers at higher institutions of learning. More precisely, the study sought to determine whether digital knowledge management increased efficiency among administrative officers, whether training enhanced digital knowledge management resulting in improved performance, and whether digital communication and collaboration improved knowledge sharing.

In light of the dissertation structure, the following hypotheses were tested.

H1: Digital knowledge management systems significantly improve administrative efficiency and performance in higher education institutions.

H2: Digital knowledge management and regular training boost the morale of administrative staff for better performance.

H3: Communication and collaboration through digital platforms positively impact knowledge-sharing practices among higher education administrative staff.

Nevertheless, the hypotheses formulated in this paper were not just technical problems. Each of them was a real problem to deal with. Hypothesis 1 (H1) will examine work efficiency and the quality of administrative services. Hypothesis 2 (H2) will address the human factor related to digitalisation and find out how support and training help people become more competent and reduce their anxiety, therefore making them more productive. Hypothesis 3 (H3) will involve cooperation in digital knowledge management and determine whether knowledge exchange takes place through communication software.

4. Research Methodology

Descriptive Quantitative Methodology was adopted. The selection of this type of methodology was appropriate since there would be no need for intervention during this research exercise. The purpose of the study involved only the investigation of digital knowledge management perception and experience of the participants. The data collection tool included the Google Form containing questions related to

demographic information, digital competency level, barrier experience, practice of digital knowledge sharing, training provision, and administrative outcomes.

The total number of observations included in the data set was 201 observations. The procedure of normalization of the data set was performed with the help of the Python program involving renaming of columns, label normalization, ordinal recoding of the questions and reversing of negative-barrier questions. After the stage of data cleansing was complete, measurement of constructs for required variables was carried out in order to test the hypotheses.

In terms of demographics, an equal distribution of the number of males and females (102 and 99 respectively) was

identified. Most respondents were within the age range of 25-35 and had lower to moderate work experience. In regard to department, most representation was seen from the administrative department, accountancy department, examination cell, and student support service departments. It is important to discuss these departments since they are deeply involved in knowledge circulation and process management in the organisation.

Reliability of constructs was also analyzed prior to interpretation. The reliability of the administrative efficiency construct proved very good, as did the reliability of the morale and performance constructs. Nevertheless, the reliability of the communication and cooperation construct needed for Hypothesis 3 proved poor, demanding more cautious interpretation. Such reliability results make it possible to discuss the results not only in terms of their significance but also in terms of their reliability.

Table 1: Demographic Profile of Respondents (N = 201)

Variable	**Category**	**n (%)**
Gender	Male	102 (50.7%)
Gender	Female	99 (49.3%)
Age Group	25-35	130 (64.7%)
Age Group	36-45	34 (16.9%)
Age Group	46-55	25 (12.4%)
Age Group	Above 55	12 (6.0%)
Work Experience	Less than 1 year	66 (32.8%)
Work Experience	1-3 years	58 (28.9%)
Work Experience	3-5 years	29 (14.4%)
Work Experience	More than 5 years	42 (20.9%)

The analysis above shows that the data sample contained both gender equality and a good number of young people or relatively inexperienced people. The reason why this factor is crucial is that information technologies are likely to play an essential role when institutions try to cut down their reliance on individual memory.

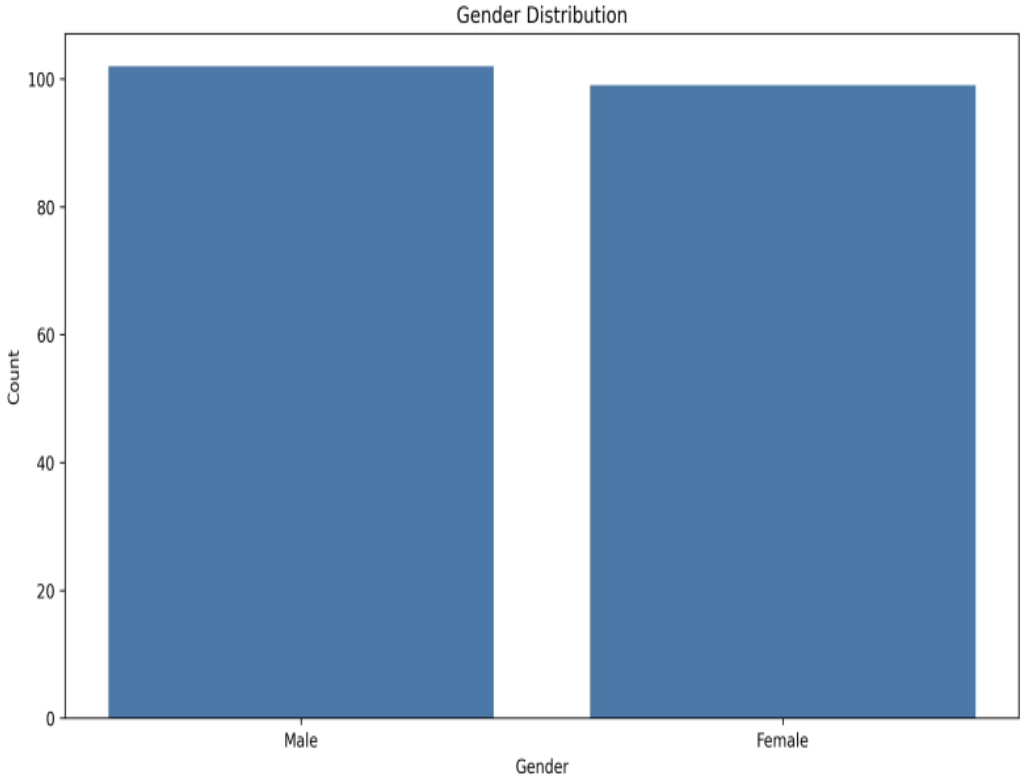
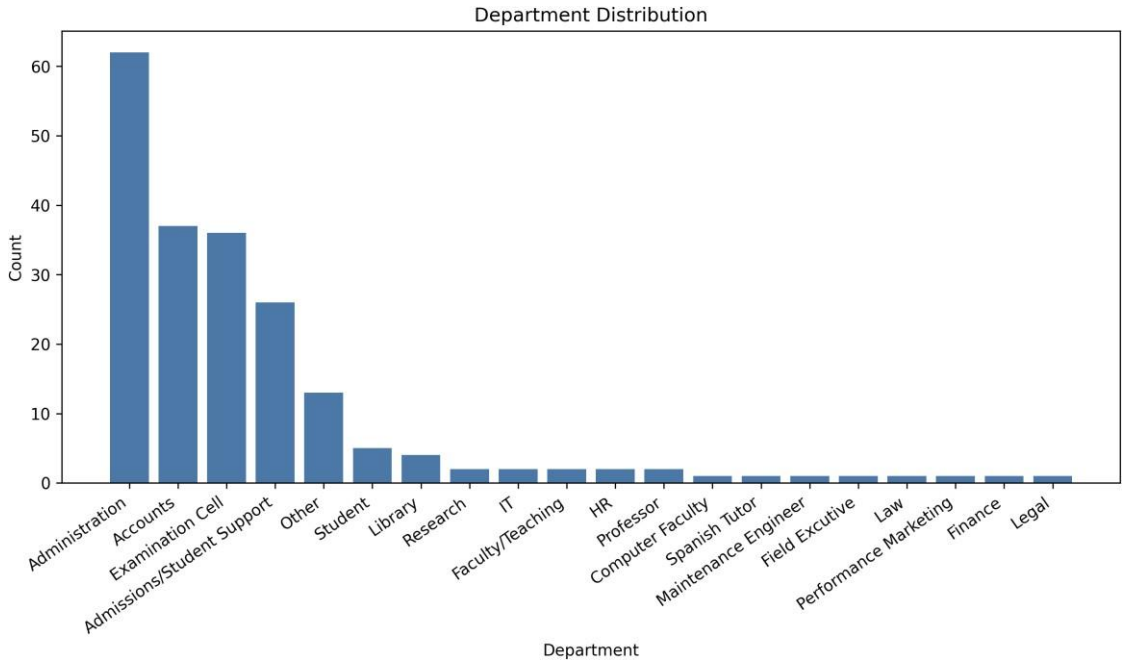


Figure 1: Gender Distribution of Respondents

Figure 2: Department-wise Distribution of Respondents



There are two useful trends in these demographic graphs. Firstly, there is an almost even distribution of men and women in the sample, which helps ensure that results will not be based on just one gender category. Secondly, the departmental graph also proves that most of the answers have been obtained in departments where all the activity depends on computers, since their use is crucial for their performance. This makes the results more realistic

.

5. Results and Discussion

Based on the results obtained from the research study, it is clear that there exists an obvious positive correlation between digitalization and knowledge management in the administration of universities. This can be attributed to the fact that all the hypotheses tested in this research were statistically significant, although to varying degrees.

As for statistical significance, Hypothesis 2 proved to be more significant than the other two hypotheses, followed by Hypothesis 1 and then Hypothesis 3.

Even though statistical significance alone may suffice to make a claim, there are other considerations regarding the relationship between variables that should not be neglected. It is equally essential to take into account both the strength of the relationship and its reliability in measurement.

This is the reason why Hypothesis 3 needs to be carefully analyzed and not treated equally with Hypothesis 1 and 2.

Table 2: Summary of Hypothesis Testing Results

Hypothesis	**Relationship Tested**	**Pearson r**	**Pearson p**	**Spearman r**	**Spearman p**
H1	DKM system score → Administrative efficiency score	0.275	0.000078	0.392	0.0000000086
H2	Support/training score → Morale/performance score	0.323	0.00000287	0.388	0.0000000127
H3	Clear Communication → Knowledge sharing	0.183	0.00937	0.250	0.000349

From the results, it is evident that all the three hypotheses had positive and statistically significant results, although their importance differed. Hypothesis two had the highest coefficients, hypothesis one had a relatively lower yet positive result, while hypothesis three had a positive but less impactful coefficient. From this trend, it can be argued that digital transformation is most effective when organizations build staff capabilities instead of investing in software.

5.1 Hypothesis 1: Digital Knowledge Management and Administrative Efficiency

The first hypothesis stated that the application of digital knowledge management systems was significant to the efficiency and effectiveness of administration. This can be seen by analyzing the statistical data, which supports this hypothesis. The coefficient correlation of Pearson between the scores of application of the digital knowledge management system and administrative efficiency stood at 0.275, and the p-value was 0.000078, while for the coefficient correlation of Spearman, these were 0.392 and 0.0000000086 respectively.

From the perspective of practice, this means that one's ability to operate digital knowledge management systems and the corresponding confidence and perception of knowledge sharing among employees can contribute to faster accomplishment of tasks, better time management and, finally, administrative efficiency in general. This outcome is consistent with the scholarly literature, which states that documented and available knowledge decreases the risk of delay, mistakes and inefficiency due to the lack of information, which relies on people's memories [4], [5].

The reliability pattern also assists in understanding this hypothesis. The internal consistency of the administrative efficiency construct was quite high, while the reliability of the digital knowledge management system scale was reasonable. Therefore, it can be argued that the correlation holds both statistical and theoretical relevance. Consequently, one can conclude that digital knowledge management systems lead to increased efficiency, which in itself is cumulative. Information becomes easier to locate, there is better continuity in routine activities, and repetitive search activities become unnecessary.

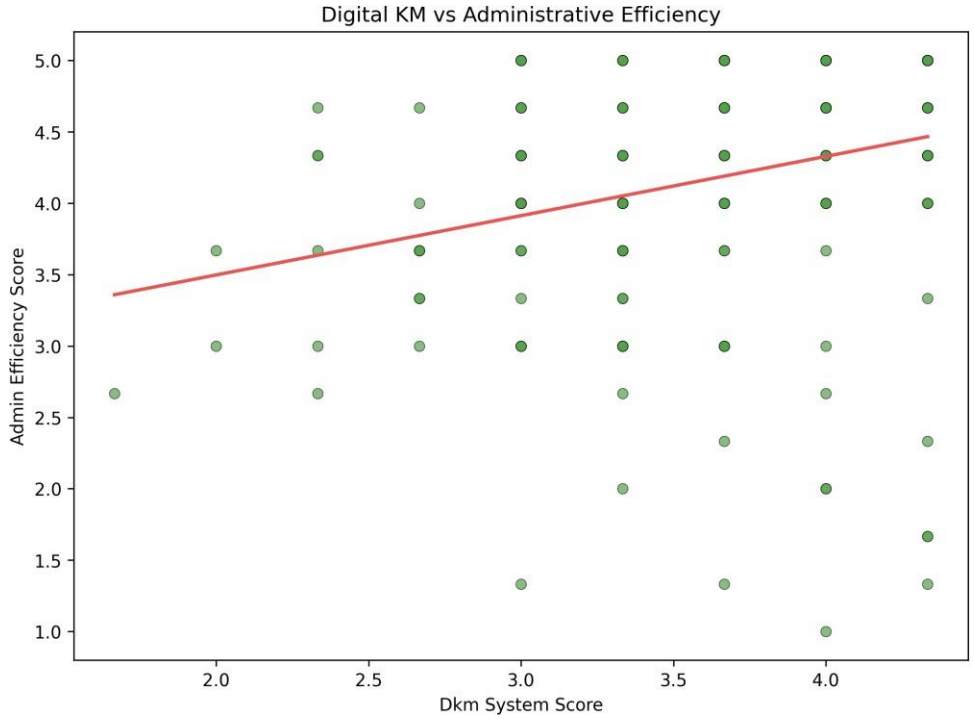


Figure 3: Scatter Plot for Hypothesis 1

The graph above displays the data in such a way that there is an upward trend compared to a random dispersion, and this can be explained in light of the positive correlation between the two variables. It means that although there may be other factors affecting the efficiency, it appears that better digital knowledge practices result in more effective administration.

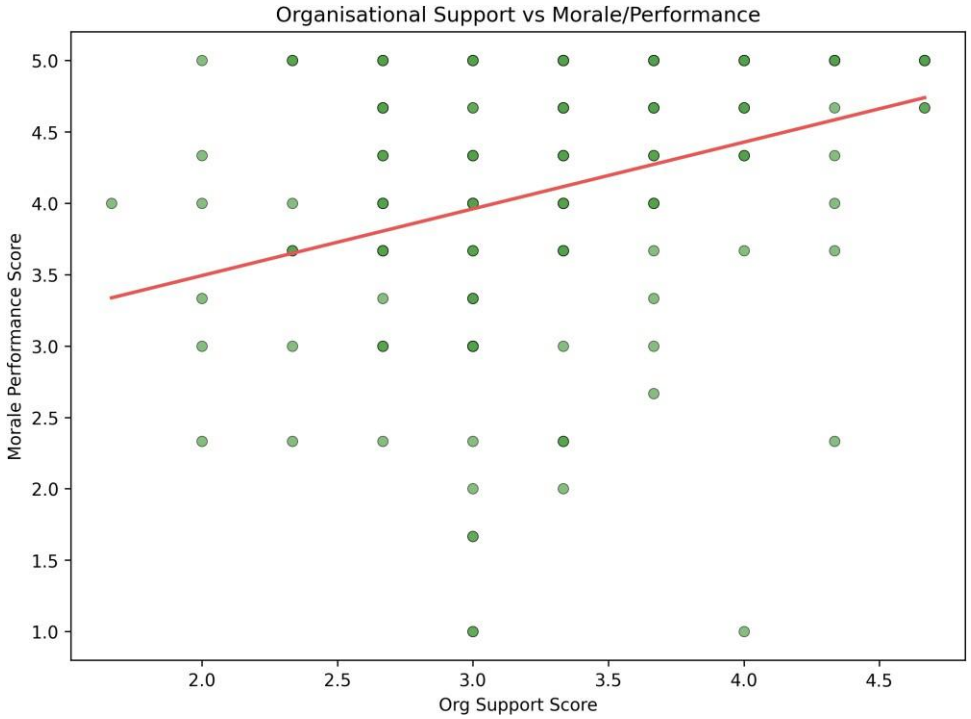
5.2 Hypothesis 2: Digital Knowledge Management, Training and Staff Morale

As mentioned, Hypothesis 2 considered whether digital knowledge management and training have a positive effect on morale/performance. This hypothesis demonstrated the most robust association compared to other hypotheses. Pearson correlation coefficient between organisational support and training-related factors and morale/performance showed the value of 0.323 with a p-value of 0.00000287. In turn, the Spearman correlation revealed the figure of 0.388 with a p-value of 0.0000000127. Thus, these findings imply a statistically significant positive connection slightly more robust than in case of administrative efficiency.

The significance of this finding may be associated with a human factor, which is frequently neglected in discussions regarding digitalisation. Indeed, based on results, digitalisation seems to be helpful in enhancing performance and improving employees' morale only if respondents report enough training and confidence while using new technologies. That is to say, digitalisation per se is not effective since it can be fruitful only when organisations make efforts to develop employees' abilities. As such, the conclusions of this study correspond with previous ones that highlighted the key role of training in successful implementation of digital solutions [6], [7], [8].

The morale and performance construct showed high reliability, which strengthens confidence in this finding. The result suggests that training performs two functions at once. First, it improves the operational side of work by reducing confusion and mistakes. Second, it improves the psychological side of work by reducing stress, increasing confidence and making digital tools feel supportive rather than burdensome. These two factors combined account for the fact that Hypothesis 2 turned out to be the strongest hypothesis.

Figure 4: Scatter Plot for Hypothesis 2



Secondly, in relation to the scatter plot, the plot represents the most positive concentration of the three relationships under consideration. Even though there exists some spread on the plot, the positive concentration pattern on the plot is clearly visible compared to that of H1.

5.3 Hypothesis 3: Digital Communication, Collaboration and Knowledge Sharing

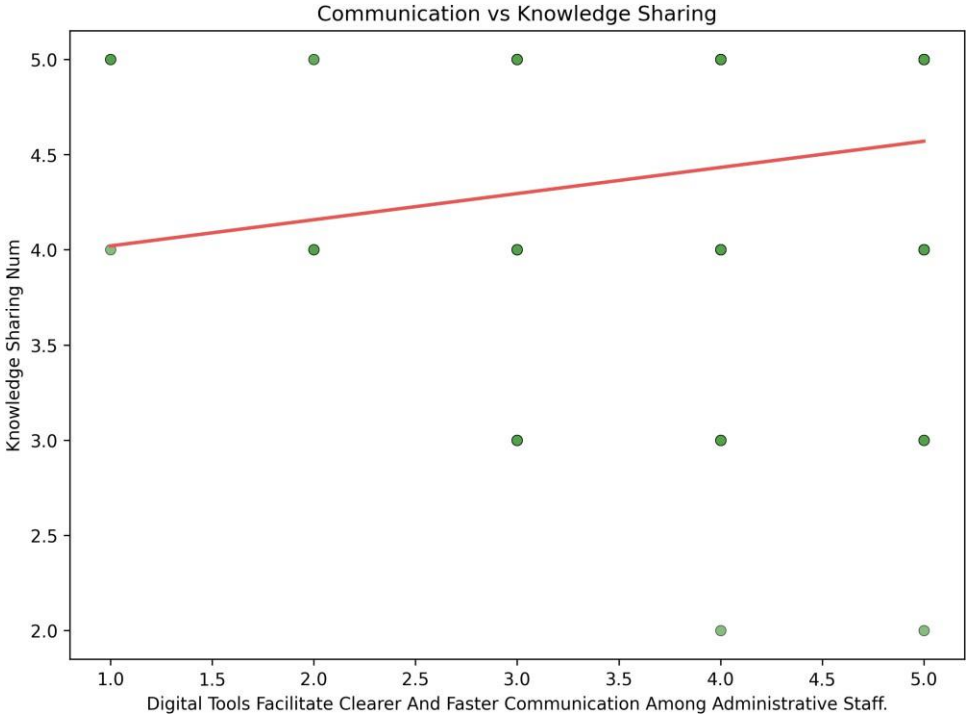
Hypothesis 3 was about the positive impact of communication and collaboration through digital media on knowledge sharing practices. Indeed, a positive and statistically significant correlation between these two variables can be observed. However, its size is not as high as in the first two hypotheses. For example, the Pearson coefficient equals 0.183 with a p-value of 0.00937, while the Spearman coefficient equals 0.250 with a p-value of 0.000349. Therefore, it could be argued

that better digital communication entails effective knowledge sharing activities, even though the strength of correlation is relatively weak.

In this situation, one would want to consider the reliability of the used measurement. In fact, the Cronbach's Alpha value of the construct under consideration and associated with hypothesis 3 equals 0.298781. Thus, one can argue that there is low internal consistency of the scale in question. Consequently, the researcher would recommend accepting the statistical correlation mentioned above, though with some caution.

In regard to this matter, according to the research finding, while it can aid in the sharing of knowledge through technology, it does not guarantee that the information will be documented and retained for future use. This means that the message is disseminated quickly, but not necessarily put in the documentation section of the institution. This point should be taken seriously in the bureaucratic environment, where the process of knowledge sharing should not just involve discussion but documentation as well.

Figure 5: Scatter Plot for Hypothesis 3



The scatter plot for H3 is more dispersed than the earlier two. This is expected due to the fact that the lower correlation coefficients and reliability imply the need for more careful interpretations.
The plot does still show a trend going up, meaning that the relationship between the variables is still positive but requires some additional caution. Communication tools seem to be effective, while better documentation might help further stabilize communications.

5.4 Comparative Interpretation of the Three Hypotheses

Comparison of the three tested hypotheses can reveal how the results are organized. Digitalization demonstrates its maximum benefits in combination with training, support, and confidence-building activities. Digitalization's contribution to administrative efficiency can be also considered highly positive, although somewhat less impressive than above. Communication and collaboration are other positive factors, although low quality of the construct implies some conceptual deficiencies at this stage. The comparative chart below represents this hierarchy graphically.

As seen from the comparison chart, Hypothesis 2 ranks first, followed by Hypothesis 1, which stays highly positive. Hypothesis 3 ranks last, yet still demonstrates a positive relationship between the variables in question. Such hierarchy is meaningful for practice since training and support cannot be viewed as secondary components of digitalization process.

6. Practical Implications

The conclusions reached by the research are directly applicable for practice at higher education institutions. Firstly, HEIs need to see digital knowledge management as an infrastructural element of workflow efficiency. Provided that digital processes are created with emphasis on retrievability, process transparency and accessibility, administrative processes at universities may become more efficient in a tangible sense. Secondly, the most pronounced conclusion made as per the results of the research proves that training is an essential component. By means of proper training, employees will be able to use digital systems more proficiently; otherwise, technologies might be seen as an extra source of stress.

Thirdly, communication channels ought to be linked to knowledge management systems. Weak yet positive conclusions regarding Hypothesis 3 indicate the necessity of transforming communication into reusable knowledge. This task can be accomplished by keeping digital manuals and checklists at universities along with approval templates and digital archive of information. Lastly, managers need to be aware of the fact that digital knowledge management is an organizational and technological task. It involves not only technology itself but also supportive policies, managerial roles and collaboration practices.

7. Limitations

The study is founded on survey data provided by participants themselves, hence, meaning that the outcomes are shaped by perceptions of respondents rather than any log of the system itself or an audit. It should be noted that despite the importance of such perceptions in reflecting personal experience of working with the system, they may still involve certain bias. The second limitation refers to the degree of measurement validity. Even though constructs used in Hypotheses 1 and 2 were reliable, the one in Hypothesis 3 proved to be poor.

A third limitation lies in a particular setting in which the results have been found. They are certainly useful for the current study with its limited number of respondents, but they cannot serve as universal evidence until they are further explored in different contexts.

8. Conclusion

Therefore, the conclusion of this paper is that digitalisation helps knowledge management for administrative staff at higher education institutions. According to the findings obtained from the analysis conducted with a sample of 201 respondents, it can be argued that digital knowledge management has positive influence on the administrative efficiency, which influence is increased when training programs are conducted regularly. It is also found that the morale and performance pathway was the most reliable, followed by the efficiency pathway. At the same time, digital communication and collaboration made contribution to knowledge sharing, yet it had relatively weak impact.

In terms of the significance of the results, it is important to mention that digital knowledge management is seen as a matter not only of technology but also of people. Digitalisation of knowledge management processes allows gaining easier and better access to necessary information and facilitates collaboration between administrative staff. However, successful implementation and functioning of a system largely depend on willingness and ability of personnel to use the digital platform effectively. Therefore, higher education institutions should focus their efforts not only on investing in new technologies but also on developing process knowledge and conducting regular trainings.

9. Conflict of Interest

There are no conflicts of interest in this research paper. The research paper has been compiled using the final year research project of the student along with the statistical outputs generated by the use of Python software.

10. Acknowledgement

The authors would like to express their sincere thanks to Dr. Sirtaj Kaur for her support during the course of research. Gratitude is expressed to the Department of Commerce; Mata Sundri College for Women, University of Delhi; and all those who participated in the survey.

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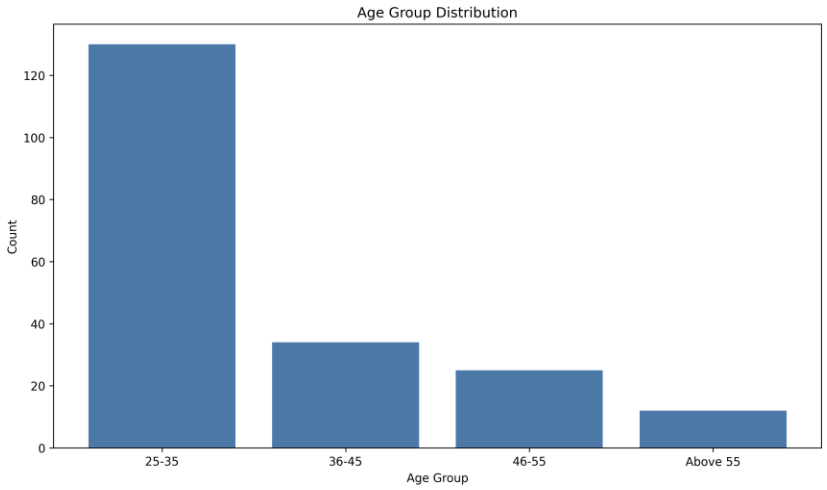
12. Appendix: Additional Graphical Evidence

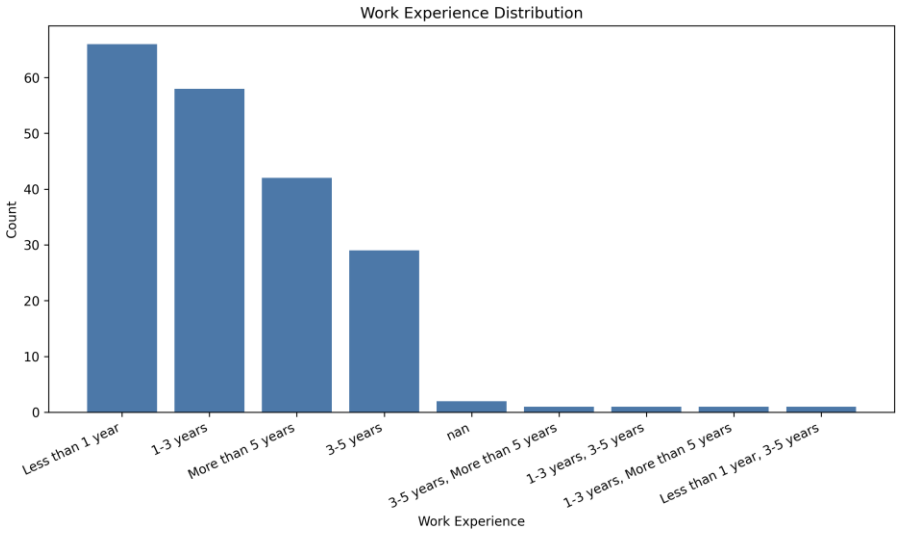
The Appendix contains extra visual representations of data obtained during the Python analysis. While these visualizations cannot be viewed as replacements of hypothesis tests conducted in this paper, they make the analysis more effective by presenting the information on how the sample is represented and how the constructs under consideration change. The fact that there are mostly young, early-career respondents in the sample helps to validate the choice of the constructs for continuity and institutional memory. The heatmap at the level of constructs is also helpful since it proves that there is a dense network of relationships around support, confidence, morale and administrative outcomes.

Figure 7: Age Group Distribution of Respondents



From the analysis of the age distribution diagram, it is clear that the age group of 25 to 35 years comprises the dominant majority among the sample. The information is good to have because the fact that the majority of the people surveyed are of an age where adapting to, learning, and becoming confident with technology becomes extremely relevant.

Figure 8: Work Experience Distribution of Respondents



From the above distribution, it can be seen that most people within the sample have less than five years of experience. This serves to confirm yet another of the practical reasons mentioned in the paper as a reason for using digital knowledge management. In this case, the reason is that digital knowledge management will be necessary if organisations want to reduce dependence on personal memory.