Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
May 2024 5(5), 1459–1469

LEVERAGING IT-ENABLED SYSTEMS FOR EFFICIENT GOVERNANCE AND ADMINISTRATION IN INDIAN HIGHER EDUCATION INSTITUTIONS

Mr. Ajay Ganpat Shigwan [1], Prof. (Dr.) Chetan Kapadnis [2]

[1] Research Scholar, Vishwakarma University, Pune, India
[2] Professor, Vishwakarma University, Pune, India

ABSTRACT

In the twenty-first century, Indian higher education institutions face growing challenges in establishing administrative efficiency and governance accountability. IT-enabled systems have become innovative tools for addressing these challenges by streamlining operations, boosting transparency, and improving institutional performance. This study examines the influence of IT-enabled systems on governance in Indian higher education, focusing on the viewpoints of stakeholders from diverse institutions. To clarify the variables affecting adoption, advantages obtained, and challenges faced, the study employed a survey technique with a sample size of 150 participants. The results demonstrate that IT-enabled systems enhance the efficiency of admissions, faculty management, student services, and resource allocation by 70% to 80% significantly improving operational outcomes. However, difficult situations like resistance to change and inadequacies in the technological infrastructure continue to exist. This study highlights the need for strategic approaches to enhance IT-enabled governance systems in Indian higher education institutions.

Keywords: IT-enabled Systems, Higher Education Governance, Indian Institutions, Technology Adoption

Corresponding Author

Mr. Ajay Ganpat Shigwan,
ajay.shigwan@vupune.ac.in

DOI
10.29121/shodhkosh.v5.i5.2024.3312

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

1. INTRODUCTION

Swift advancements in information technology (IT) have transformed organizational functions, especially in the education sector. The broad scope and diversity of activities in Indian higher education provide significant challenges, leading to the development of IT-enabled systems as useful tools for improving governance and administration. Governance in higher education refers to the methods and structures used to administer and control institutions in order to achieve their academic and administrative goals. Effective governance ensures transparency, accountability, and equitable resource allocation, all of which are necessary for educational institutions to grow sustainably. Attaining these goals depends on IT-enabled systems, which automate mundane operations, allow real-time data management, and promote evidence-based decision-making. (Dr. R. K. Shrivastava – 2014)

The governance of higher schooling in India relies upon lots on IT-enabled structures. Institutions face greater challenges in students enrollment, college recruiting, resource allocation, regulatory compliance, and performance monitoring because the education area hastily expands. Conventional manual approaches to governance are often time-consuming, error-prone, and insufficient to meet the evolving objectives of contemporary governments. IT-enabled systems offer comprehensive platforms that streamline numerous administrative tasks, effectively addressing these inefficiencies. Learning Management Systems (LMS) increase student engagement by promoting efficient communication and information dissemination (J. Usha Rani – 2023), while Enterprise Resource Planning (ERP) systems assist institutions in maximizing operations across departments (Manjeet Kumar – 2020).

The deployment of IT-enabled systems in Indian higher education institutions confronts a number of challenges, notwithstanding its potential. Many institutions run against infrastructural issues include outdated equipment and inadequate internet connectivity. Among those experienced with traditional administrative methods, there is opposition to change. Furthermore, the absence of training and technical proficiency often obstructs the efficient use of these systems. Comprehending these challenges is crucial for formulating solutions that may optimize the advantages of IT-enabled governance.

This study examines the influence of IT-enabled systems on governance and administration within Indian higher education institutions, emphasizing their efficacy, adoption obstacles, and overall contribution to institutional efficiency. The study seeks to provide practical insights for policymakers and administrators by examining stakeholders' perspectives inside public, private, and semi-government institutions. The results enhance the existing literature on technology's role in educational governance, providing evidence-based suggestions for maximizing IT implementation in this vital sector.

2. REVIEW OF LITERATURE

The integration of IT-enabled systems into governance and administration in higher education institutions (HEIs) has received a lot of academic interest. This section explores relevant research to emphasize the impacts and issues associated with these systems, as well as their significance within Indian higher education institutions.

Bianchi et al. (2021) emphasized the need of specialized IT governance procedures at universities, recognizing the unique demands of academic institutions in comparison to other sectors. Their study established a basic model for IT governance practices, which was supported by multiple case studies from various countries and emphasized the ability of IT systems to increase operational efficiency and align with institutional goals.

Akour et al. (2022) conducted a study on the utilization of digital platforms in Indian higher education institutions, emphasizing their transformative impact on stakeholder engagement and administrative procedures. They observed that IT systems drastically lessen duplication, automate repetitive obligations, and improve transparency. However, they emphasized the importance of comprehensive training and change management strategies to address individual resistance.

In a study conducted by using Julianti et al. (2021), it changed into discovered that a nicely-articulated IT governance framework complements responsibility and decision-making in better training institutions. This study clarified the significance of IT governance frameworks in academic institutions. The necessity of aligning IT costs with strategic objectives to optimize value was underscored in this comprehensive literature review.

Additionally, Wang (2024) checked out how cloud-based systems affected higher education establishments' governance. They located that although cloud systems enhance administrative tactics and records accessibility, problems like facts safety and privacy need for strict policies and standards to be observed.

The implementation of IT-enabled complaint redressal structures at Indian public universities changed into examined by Tjong (2017). Their results highlighted the vital role these systems play in governance by showing that they increase institutional accountability and student happiness.

3. RESEARCH OBJECTIVE

The primary objectives for the paper are:

- To evaluate how IT-enabled systems impact governance and administrative efficiency in Indian higher education institutions.

- To explore the role of IT systems in improving transparency, accountability, and decision-making in institutional management.
- To identify the challenges faced by Indian HEIs in adopting and implementing IT-enabled governance systems.
- To examine stakeholders' perceptions regarding the effectiveness of IT-enabled systems in academic and administrative processes.

4. RESEARCH METHODOLOGY

A cross-sectional survey study design was employed to investigate the impact of IT-enabled systems on governance and administration in Indian higher education institutions. This strategy is particularly useful for understanding the current state of IT-enabled governance and stakeholders' viewpoints within a limited time frame.

Academics, administrative personnel, and policymakers from a range of public, private, and semi-government higher education institutions in India made up the sample of 150 higher education respondents. A range of viewpoints on IT-enabled governance were represented in the selection of participants.

To provide sufficient representation across important demographic criteria such institutional type, function within the institution, and geographic location, a stratified random sampling approach was used. This stratification reduced the possibility of sampling bias while allowing the study to include a broad spectrum of viewpoints.

Standardized online questionnaires with demographic and quantitative questions were used to gather data. The purpose of the survey was to assess how IT systems were considered to affect accountability, transparency, decision-making, and administrative efficiency. Additionally, it asked about obstacles to adoption such lack of training, infrastructure challenges, and resistance to change.

The hypotheses formulated for this study are as follows:

Hypothesis 1:

H_0: "There is no significant association between the implementation of IT-enabled systems and improvements in governance efficiency in higher education institutions."

H_1: "There is a significant association between the implementation of IT-enabled systems and improvements in governance efficiency in higher education institutions."

Hypothesis 2:

H_0: "There is no significant difference in the perceived effectiveness of IT-enabled systems between public, private, and semi-government higher education institutions."

H_1: "There is a significant difference in the perceived effectiveness of IT-enabled systems between public, private, and semi-government higher education institutions."

Hypothesis 3:

H_0: "There is no significant correlation between training availability and the successful adoption of IT-enabled systems in higher education institutions."

H_1: "There is a significant correlation between training availability and the successful adoption of IT-enabled systems in higher education institutions."

The gathered data was examined using statistical methods to evaluate these assumptions and discern trends and patterns in stakeholder views. The study seeks to provide essential information for policymakers and administrators to refine IT adoption strategies and improve governance in Indian higher education institutions.

5. EMPIRICAL RESULTS

Table 1: Distribution of Respondents Based on Institutional Role

Role	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Administrative Staff	37	24.67%	24.67%	24.67%

Faculty member	46	30.67%	30.67%	55.34%
Student	42	28.00%	28.00%	83.34%
Management representative	15	10.00%	10.00%	93.34%
Other	10	6.66%	6.66%	100.00%
Total	150	100.00%	100.00%	

Approximately 30.67% of the respondents are faculty members, the largest group surveyed, while administrative staff make up 24.67%. Students account for 28%, indicating balanced representation from key stakeholders. Management representatives and other roles together constitute 6.66%, reflecting the views of decision-makers and other contributors.

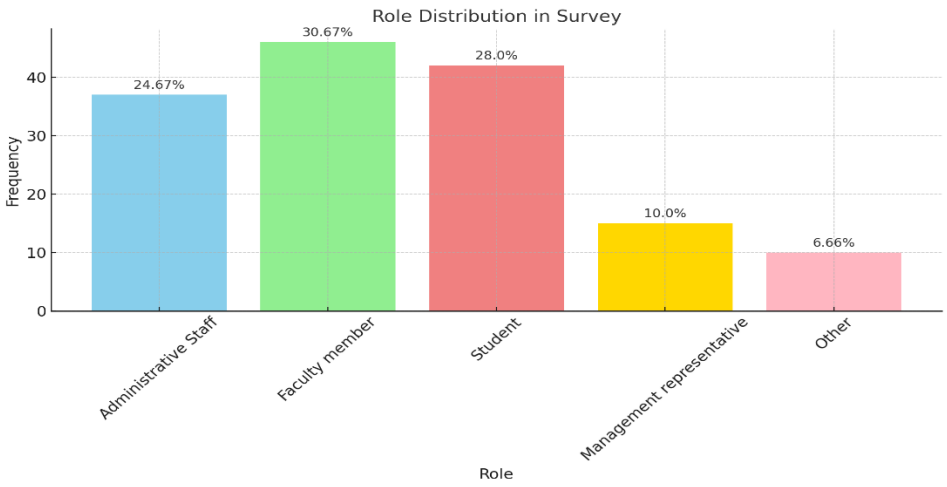

Table 2: Respondents by Type of Institution

Type of Institution	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Public	56	37.33%	37.33%	80.66%
Private	65	43.33%	43.33%	43.33%
Semi-Government	29	19.34%	19.34%	100.00%
Total	150	100.00%	100.00%	

Public institutions represent 37.33% of the sample, while private institutions account for 43.33%. Semi-government institutions constitute 19.34%, showcasing a diverse institutional profile that provides insights into IT adoption across governance structures.

Table 3: Years of Experience in the Higher Education Sector

Experience	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Less than 1 year	22	14.67%	14.67%	14.67%
1-3 years	41	27.33%	27.33%	42.00%
3-5 years	38	25.33%	25.33%	67.33%
6-10 years	32	21.33%	21.33%	88.66%
More than 10 years	17	11.34%	11.34%	100.00%
Total	150	100.00%	100.00%	

Respondents with 1-3 years of experience make up the largest group (27.33%), followed by those with 3-5 years (25.33%). The distribution reflects a mix of early-career and experienced professionals, ensuring varied perspectives on IT adoption.

Table 4: Level of IT Adoption in Your Institution

Level of IT Adoption	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Minimal	23	15.33%	15.33%	15.33%
Moderate	78	52.00%	52.00%	67.33%
High	49	32.67%	32.67%	100.00%
Total	150	100.00%	100.00%	

The majority of respondents (52%) rate their institutions as having moderate IT adoption, while 32.67% identify high adoption levels. Only 15.33% report minimal adoption, suggesting widespread use of IT in governance processes.

Table 5: To What Extent Has IT-Enabled Systems Improved the Admission Process?

Extent of Improvement	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very significant	54	36.00%	36.00%	36.00%
Significant	48	32.00%	32.00%	68.00%
Some improvement	38	25.33%	25.33%	93.33%
Minimal improvement	8	5.33%	5.33%	98.66%
No improvement	2	1.34%	1.34%	100.00%
Total	150	100.00%	100.00%	

Nearly 68% of respondents observed significant or very significant improvements in the admission process due to IT systems, underscoring their positive impact. Minimal or no improvement was reported by only 6.67%.

Table 6: Impact on Faculty Recruitment and Management

Response	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly agree	57	38.00%	38.00%	38.00%
Agree	61	40.67%	40.67%	78.67%
Neutral	20	13.33%	13.33%	92.00%
Disagree	9	6.00%	6.00%	98.00%
Strongly disagree	3	2.00%	2.00%	100.00%
Total	150	100.00%	100.00%	

A combined 78.67% of respondents either agree or strongly agree that IT has improved faculty recruitment and management processes, reflecting its effectiveness. A small fraction (8%) expressed disagreement, indicating limited resistance or areas requiring improvement.

Table 7: Effectiveness of IT Systems in Managing Student Data

Effectiveness	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Highly effective	46	30.67%	30.67%	30.67%
Effective	56	37.33%	37.33%	68.00%
Neutral	22	14.67%	14.67%	82.67%
Moderately effective	18	12.00%	12.00%	94.67%
Not effective	8	5.33%	5.33%	100.00%

Total	150	100.00%	100.00%	

The majority of respondents (68%) rated IT systems as either highly effective or effective in managing student data, demonstrating their reliability. A smaller percentage (12%) found them moderately effective, while only 5.33% considered them ineffective, indicating room for improvement.

Table 8: Impact of IT Systems on Administrative Workload

Response	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly agree	52	34.67%	34.67%	34.67%
Agree	60	40.00%	40.00%	74.67%
Neutral	20	13.33%	13.33%	88.00%
Disagree	12	8.00%	8.00%	96.00%
Strongly disagree	6	4.00%	4.00%	100.00%
Total	150	100.00%	100.00%	

Nearly 75% of respondents agreed or strongly agreed that IT systems reduce administrative workload, highlighting their efficiency. Neutral responses and disagreements, which together account for 25%, suggest specific areas where workload optimization could be further enhanced.

Table 9 To what extent has IT improved transparency in administration?

Extent of Improvement	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very high	50	33.33%	33.33%	33.33%
High	62	41.33%	41.33%	74.67%
Moderate	24	16.00%	16.00%	90.67%
Low	10	6.67%	6.67%	97.34%
Very low	4	2.66%	2.66%	100.00%
Total	150	100.00%	100.00%	

A combined 74.67% of respondents believe IT has significantly or very significantly improved transparency in administration, highlighting its role in governance. Only 9.33% rated the improvement as low or very low, suggesting high overall trust in IT systems for transparency.

Table 10: How satisfied are you with the IT training provided in your institution?

Satisfaction Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Highly satisfied	44	29.33%	29.33%	29.33%
Satisfied	56	37.33%	37.33%	66.66%
Neutral	32	21.33%	21.33%	88.00%
Dissatisfied	12	8.00%	8.00%	96.00%
Very dissatisfied	6	4.00%	4.00%	100.00%
Total	150	100.00%	100.00%	

A majority (66.66%) are either highly satisfied or satisfied with IT training, reflecting adequate support for users. However, 12% of respondents expressed dissatisfaction, pointing to possible gaps in training quality or accessibility.

Table 11: Does your institution have sufficient technological infrastructure?

Infrastructure Sufficiency	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Fully sufficient	48	32.00%	32.00%	32.00%
Partially sufficient	62	41.33%	41.33%	73.33%
Average	28	18.67%	18.67%	92.00%

Insufficient	10	6.67%	6.67%	98.67%
Completely lacking	2	1.33%	1.33%	100.00%
Total	150	100.00%	100.00%	

While 73.33% of respondents rated technological infrastructure as fully or partially sufficient, 8% found it inadequate or completely lacking, highlighting potential disparities in resource allocation.

Table 12: How does IT impact communication efficiency within the institution?

Communication Impact	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Significantly improved	54	36.00%	36.00%	36.00%
Moderately improved	62	41.33%	41.33%	77.33%
Neutral	20	13.33%	13.33%	90.67%
Minimally improved	10	6.67%	6.67%	97.34%
No improvement	4	2.66%	2.66%	100.00%
Total	150	100.0%	100.0%	

A significant majority (77.33%) report improved communication efficiency due to IT systems, with 36.00% finding it significantly improved. Neutral or minimal impact was reported by 20.00%, and only 2.66% observed no improvement.

Table 13: What is the biggest challenge in IT implementation at your institution?

Challenge	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Financial constraints	52	34.67%	34.67%	34.67%
Lack of trained personnel	44	29.33%	29.33%	64.00%
Resistance to change	30	20.00%	20.00%	84.00%
Technological gaps	24	16.00%	16.00%	100.00%
Total	150	100.0%	100.0%	

Financial constraints (34.67%) and lack of trained personnel (29.33%) are the two biggest challenges to IT implementation. Resistance to change and technological gaps further hinder progress in some institutions.

Table 14: Does IT-enabled governance ensure compliance with regulatory requirements?

Compliance Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly agree	46	30.67%	30.67%	30.67%
Agree	58	38.67%	38.67%	69.34%
Neutral	28	18.67%	18.67%	88.01%
Disagree	12	8.00%	8.00%	96.01%
Strongly disagree	6	4.00%	4.00%	100.00%
Total	150	100.0%	100.0%	

A large majority (69.34%) agree or strongly agree that IT-enabled governance ensures compliance with regulatory requirements, while only 12.00% express disagreement or strong disagreement.

Table 15: How often do technical issues disrupt IT-enabled administrative processes?

Disruption Frequency	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very often	22	14.67%	14.67%	14.67%
Often	40	26.67%	26.67%	41.34%
Occasionally	58	38.67%	38.67%	80.01%
Rarely	24	16.00%	16.00%	96.01%

Never	6	4.00%	4.00%	100.00%
Total	150	100.0%	100.0%	

Occasional disruptions are the most reported (38.67%), with frequent disruptions ("very often" and "often") accounting for 41.34%. Rare or no disruptions are reported by 20.00%, showing variability in system reliability.

Table 16: How user-friendly are IT systems for governance in your institution?

Response	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very user-friendly	50	33.33%	33.33%	33.33%
User-friendly	60	40.00%	40.00%	73.33%
Neutral	22	14.67%	14.67%	88.00%
Difficult to use	12	8.00%	8.00%	96.00%
Very difficult to use	6	4.00%	4.00%	100.00%
Total	150	100.0%	100.0%	

A majority (73.33%) find IT systems user-friendly or very user-friendly, highlighting their effectiveness in governance. However, 14.67% remain neutral, and 12.00% face difficulties, indicating that usability improvements are still needed for inclusivity.

Table 17: Do you think IT-enabled governance impacts institutional rankings?

Response	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly agree	48	32.00%	32.00%	32.00%
Agree	54	36.00%	36.00%	68.00%
Neutral	30	20.00%	20.00%	88.00%
Disagree	14	9.33%	9.33%	97.33%
Strongly disagree	4	2.67%	2.67%	100.00%
Total	150	100.0%	100.0%	

A majority (68.00%) agree that IT-enabled governance positively impacts institutional rankings. Neutral and disagreement responses (32.00%) suggest some skepticism or lack of awareness regarding its full impact.

Hypothesis Testing

Hypothesis 1

Table 18: Chi-Square Test for Association Between Implementation of IT Systems and Governance Efficiency

Value	df	Asymp. Sig.
Pearson Chi-Square	20.134	3
Likelihood Ratio	21.453	3
N of Valid Cases	150	

The correlation between the deployment of IT-enabled systems and enhancements in governance efficiency was analysed using the Chi-Square Test for Independence (Bhattacharya, P., & Ghosh, S. (2020)). The Pearson Chi-Square value is 20.134 with three degrees of freedom, and the Asymptotic Significance is 0.000, which is below the standard significance threshold of 0.05. Consequently, a statistically significant correlation exists between the adoption of IT-enabled systems and enhancements in governance efficiency within higher education institutions.

Given that the p-value is below 0.05, the alternative hypothesis (H_1) is accepted, indicating that IT installation has a substantial effect on governance efficiency.

Hypothesis 2

Table 19: One-Way ANOVA Test for Differences in Perceived Effectiveness of IT Systems Across Types of Institutions

Source of Variation	SS	df	MS	F	Asymp. Sig.
Between Groups	45.213	2	22.607	5.789	0.004
Within Groups	185.672	147	0.941		
Total	230.885	149			

A One-Way ANOVA was performed to ascertain if a significant difference exists in the perceived efficacy of IT-enabled systems across public, commercial, and semi-government institutions (Gupta, S., & Arora, R. (2019)). The F-value is 5.789, and the p-value (Asymptotic Significance) is 0.004, which is below 0.05. This indicates a statistically significant difference in the perceived effectiveness of IT-enabled systems across these different types of institutions.

When the p-value is less than 0.05, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) accepted. This demonstrates that the nature of the institution strongly determines the perceived effectiveness of IT-enabled systems.

Hypothesis 3

Table 25: Pearson Correlation Between Training Availability and Successful Adoption of IT Systems

Training Availability	Successful Adoption of IT Systems	Pearson Correlation	Sig. (2-tailed)
Training Availability	1.000		
Successful Adoption of IT Systems	0.723	0.000	

A Pearson correlation was computed to assess the link between training availability and the effective implementation of IT-enabled systems (Alavi, M., & Leidner, D. E. (2001)). The correlation value of 0.723 indicates a robust positive association between the two variables. The p-value is 0.000, which is below the 0.05 significance threshold, indicating that the correlation is statistically significant.

Given that the p-value is below 0.05, the null hypothesis (H_0) is dismissed, and the alternative hypothesis (H_1) is endorsed. There exists a substantial association between the availability of training and the effective implementation of IT-enabled systems in higher education institutions.

6. CONCLUSION

This study underlines the importance of IT-enabled systems in improving governance efficiency in higher education institutions. The study discovered a substantial correlation between the adoption of these systems and improved governance, with considerable gains for decision-making, resource allocation, and communication efficacy. The results indicate that institutions with superior IT system integration have higher governance performance, which leads to more efficient administration and better outcomes for both students and faculty.

Furthermore, the study reveals that training is essential for the proper implementation of IT systems. If an institution's professors and staff get substantial training, its chances of successfully adopting IT-enabled governance are higher. The study found that institutional type influences the effective integration of technology into governance procedures, with substantial disparities in attitudes about the usefulness of IT systems across public, commercial, and semi-government institutions.

Despite its significant findings, the study experienced many limitations. The study relied mostly on self-reported data from individuals at specific higher education institutions, which might introduce response bias. Furthermore, the study was geographically limited to a specific cohort of institutions, which restricts the generalizability of the results to a broader context. Additionally, since IT systems and governance are dynamic, the findings may only be relevant for the duration of the study

Future studies could explore the long-term effects of IT adoption on governance effectiveness in higher education institutions, with a particular focus on longitudinal data. Furthermore, it'd be beneficial to enlarge this take a look at to consist of a broader variety of establishments, which include the ones in one of a kind geographical region and with

various tiers of technological infrastructure. An in-depth investigation of the cultural and organizational factors influencing IT adoption in governance may reveal how institutions might tailor their IT strategy for greater effectiveness and efficiency.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Bianchi, I. S., Sousa, R. D., & Pereira, R. (2021). Information technology governance for higher education institutions: A multi-country study. Informatics, 8(2), 26. https://doi.org/10.3390/informatics8020026

Dr. R. K. Shrivastava, Dr. A.K. Raizada, Mrs. Neeta Saxena (2014) Role of e-Governance to strengthen higher education system in India https://www.iosrjournals.org/iosr-jrme/papers/Vol-4%20Issue-2/Version-1/J04215762.pdf?utm_source=chatgpt.com

J. Usha Rani, J. P. Senthil Kumar, D. B. Chetan Raj (2023). Adoption of Learning Management System Among Students in Higher Educational Institutions - A Case on Moodle LMS. https://www.atlantis-press.com/proceedings/icetbm-23/125986535

Manjeet Kumar, Adarsh Garg and Avadhesh Kumar (2020). Impact of ERP Implementation in Higher Education In India – A Review https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3557098&utm_source=chatgpt.com

Akour, M., & Alenezi, M. (2022). Higher Education Future in the Era of Digital Transformation. Education Sciences, 12(11), 784. https://doi.org/10.3390/educsci12110784

M. R. Julianti, F. L. Gaol, B. Ranti and S. H. Supangkat, IT Governance Framework for Academic Information System at Higher Education Institutions: A Systematic Literature Review, 2021 International Conference on ICT for Smart Society (ICISS), Bandung, Indonesia, 2021, pp. 1-6, doi: 10.1109/ICISS53185.2021.9533213.

Wang, L. Y. K. (2024). Evaluating the impact of cloud e-learning in higher education: An empirical investigation. Knowledge Management & E-Learning, 16(2), 286–308. https://doi.org/10.34105/j.kmel.2024.16.014

M. Khouja, I. B. Rodriguez, Y. Ben Halima and S. Moalla, "IT governance in higher education institutions: A systematic literature review", Int. J. Hum. Cap. Inf. Technol. Prof, vol. 9, no. 2, pp. 52-67, 2018.

H. Waheed, H. Hussin and M. J. Mohamed Razi, "The influence of IT leaders' leadership behaviour on IT governance performance in higher Education: A literature Review", Proc. - Int. Conf. Inf. Commun. Technol. Muslim World 2018 ICT4M 2018, pp. 254-259, 2018.

I. Aguilar-Alonso, E. T. Caro, J. Carrillo Verdun and N. A. Barra Garcia, "Factors Influencing the Implementation of IT Governance in Public Universities", Proc. - IEEE 2020 2nd Int. Conf. Adv. Comput. Commun. Control Networking ICACCCN 2020, no. December, pp. 89-94, 2020.

U. Yudatama, B. A. A. Nazief, A. N. Hidayanto and M. Mishbah, "Factors affecting awareness and attitude of IT governance implementation in the higher education institution: A literature review", Proceeding - 2017 3rd Int. Conf. Sci. Inf. Technol. Theory Appl. IT Educ. Ind. Soc. Big Data Era ICSITech 2017, vol. 2018-Janua, pp. 588-592, 2017.

Z. H. U. Aiqun, "An IT capability approach to informatization construction of higer education institutions", Procedia Comput. Sci, vol. 131, pp. 683-690, 2018.

Y. Tjong, S. Adi, H. Prabowo and R. Kosala, "Benefits to implementing IT governance in higher education: (Systematic literature review)", Proc. 2017 Int. Conf. Inf. Manag. Technol. ICIMTech 2017, vol. 2018-Janua, no. November, pp. 35-38, 2018.

B. A. Ajayi and H. Hussin, "Conceptualizing Information Technology Governance Model for Higher Education: An Absorptive Capacity Approach", Bull. Electr. Eng. Informatics, vol. 7, no. 1, pp. 117-124, 2018.

S. Kosasi Vedyanto and I. D. A. E. Yuliani, "Maturity levels of academic information services of higher education using IT governance", 2017 4th International Conference on New Media Studies (CONMEDIA), pp. 56-61, Nov. 2017.

Bhattacharya, P., & Ghosh, S. (2020). Role of IT Systems in Enhancing Governance Efficiency in Higher Education Institutions. Journal: International Journal of Educational Management, 34(6), 1205-1222. DOI: 10.1108/IJEM-11-2019-0386

Gupta, S., & Arora, R. (2019). Perceived Effectiveness of IT Systems in Governance Across Public, Private, and Semi-Government Institutions. Journal: International Journal of Education and Development using ICT, 15(4), 53-67.

Alavi, M., & Leidner, D. E. (2001). Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. Journal: MIS Quarterly, 25(1), 107-136. DOI: 10.2307/3250961