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Digital Leadership and AI-Enabled Organizational Transformation in Higher Education Institutions

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Abstract - **The digital transformation is reshaping Higher Education Institutions (HEIs) and institutions must be effectively managed by good leadership and smart technologies to boost the performance and competitiveness of their institutions. There has been little empirical evidence available to investigate the role of digital leadership in the adoption of artificial intelligence (AI) and in organizational change in higher education systems, however. It aims to discuss the interdependencies of digital leadership, Artificial Intelligence and organizational transformation and institutional competitiveness in HEIs. This study employed the cross-sectional survey quantitative research design and collected its data from 65 respondents from the higher education institutions in India including faculty members, academic administrators, academic leaders and IT employees. The proposed conceptual model was tested using the software of Partial Least Squares Structural Equation Modeling (PLS-SEM) available in the SmartPLS 4 software. The results show that digital leadership has a significant impact on AI adoption (β = 0.565, p < 0.001) and organizational transformation (β = 0.426, p < 0.001). The adoption of AI also has a significant effect on organization transformation (β = 0.388, p < 0.001), whereas organization transformation has a strong impact on the institutional competitiveness (β = 0.578, p < 0.001). The mediation effect of AI use in the digital leadership-organizational transformation linkage was confirmed in the mediation analysis as well. The study fills the gaps of the studies on information science and digital transformation because of the integration of leadership capability, intelligent technology adoption and organizational transformation. The findings provide practical suggestions to education leaders and policy makers to improve their institutions through digital leadership and AI.**

Keywords: **Digital Leadership, Artificial Intelligence Adoption, Organizational Transformation, Institutional Competitiveness, Higher Education Institutions, Digital Transformation, PLS-SEM**

I. INTRODUCTION

Higher education is rapidly changing in an era of digital technologies, artificial intelligence (AI), and greater global competition. In an era of technological advancements, universities are increasingly required to adopt new technologies in teaching, research, and administration to achieve better institutional efficiency and competitiveness (Dwivedi et al., 2021; Kovacevic et al., 2025). Digital leadership is crucial for initiating technological change and for cultivating organizational cultures that are innovative (Khairullah et al., 2025). It is the capacity of leaders to adopt and execute digital transformation initiatives as well as foster technology adoption and innovation within institutional processes (Adewale & Ndwandwe, 2025; Hojeij, 2025).

Though India's higher education system is one of the largest in the world, it is facing problems such as lack of quality, competitiveness, and technology adoption (Joshi & Ahir, 2019). The National Education Policy (NEP) 2020 has highlighted digital learning, interdisciplinary education, international cooperation, and research innovation as key policy priorities to bolster India's place in the global knowledge economy (Joshi, 2023). Meanwhile, internationalization has emerged as vital to improve research cooperation, mobility of students and institutional competitiveness. The use of AI technologies in learning analytics, personalized learning, decision support, and administrative automation is on the rise, enhancing institutional efficiency and engagement with students (Dwivedi et al., 2021; Shahzad et al., 2025). Many institutions, however, still have challenges in leadership and technological preparedness. Thus, this study will explore the role of digital leadership in the adoption of AI and organizational transformation in HEIs.

Digital technologies are becoming more and more embedded in leadership roles and practices, and digital leadership is a key factor in the leadership of a transformation and innovation in an organization (Sposato & Dittmar, 2026). Digital leadership is the capacity of leaders to carry out digital transformation strategies, to embrace new technologies and to promote collaborative innovation cultures. Higher education institutions must adapt to shifts in technology and pedagogy by embedding digital tools in learning, research and governance; and fostering faculty learning and digital infrastructure (Gkanatsiou et al., 2025; Bond et al., 2018; Ting & Xing'an, 2026). Digital leadership is gaining significance in India for bolstering research ecosystems, technological integration, and institutional

competitiveness, as highlighted in this previous study (Nnaji et al., 2026).

AI has emerged as one of the disruptive technologies used in universities to aid personalized learning, predictive analysis, student services, and decision making (Dwivedi et al., 2021). AI contributes to efficiency, better engagement of learners, and evidence-based policy (Purnomo, 2026). Adoption of AI is successful if an institution is ready to adopt it, there is support from leadership, and technological capabilities exist (Saman et al., 2024). The importance of AI for Indian universities is increasing since the use of technology and innovation will ensure competitiveness (Joshi, 2023).

Digital transformation has greatly influenced the structure, processes, and strategies within organizations across industries, among which is education. Organizational transformation encompasses the remodeling of an organization's structure, process, and culture in order to react to technology-based environmental changes. In universities, these involve digital learning platforms, data analytics, interdisciplinarity of research, and governance through technology. Universities are now employing digital transformation strategies in order to increase efficiency, research output, and global collaboration while remaining flexible enough to be able to respond to fast-changing technology (Shata & Hartley, 2025). Leadership plays a great role in coordinating organizational strategies in response to technology. In India, transformation can be facilitated by policies that encourage multidisciplinary and digital technology use (Joshi, 2023).

Global Competitiveness and Internationalization of Higher Education

The phenomenon of globalization has transformed the higher education sector in terms of increasing competition over international student enrollment, research grant funding, and international prestige. Internationalization involves embedding the global, intercultural, and cross-border aspects into learning, research, and organizational processes to enhance collaboration and sharing of knowledge. In India, it remains an important approach to enhance competitiveness and attract international students, with policy changes that encourage international linkages and research collaborations (Joshi, 2023). Nevertheless, attaining global competitiveness necessitates digital infrastructures, adoption of digital technologies, and good leadership skills. Digital leadership and adoption of artificial intelligence thus remain important.

This paper advances the information science and digital transformation literature in three important ways. This study proposes, in the context of higher education institutions, an integrated theoretical model that relates digital leadership, the use of AI, organizational transformation and institutional competitiveness. Second, with the proposed framework in mind, the mediating role of AI adoption is empirically tested using the partial least squares structural equation modeling (PLS-SEM) approach. Third, the results obtained from this study will be relevant to the managers and policy makers in the third level of education.

The structure of this study is presented as follows: This paper is structured as follows: The conceptual framework of this study is presented in section 2. The theory behind the framework developed is outlined in Section 3. The hypotheses of this research are formulated in section 4. The research methodology employed is covered in Section 5 which includes research design, sample, measurement of variables, and data analyses. The empirical results for this study are presented in section 6. Section 7 discusses the results of this study. The paper ends with a summary of its findings in Section 8 and some suggestions for further studies.

II. Conceptual Framework

Higher education institutions are facing a transformation era brought by the digital age and its impact on the knowledge economy. The universities are expected to introduce a new technology, new pedagogical models and a new digital governance model to enhance their performance and competitiveness at the global level. In this process of transformation, leadership is a crucial factor in the direction of institutions in adopting technology and changing their organization. Digital leadership is a skill that is increasingly recognized as being necessary for organizations to understand how to navigate a changing technology environment and adopt new technologies such as AI. Digital competent leaders can imagine how to solve a problem using digital technology, encourage innovation and facilitate the application of digital technology in organizational processes. Digital leadership can contribute to the development of digital learning systems, improvement of research capacities and technology-based administration systems in higher education institutions. The use of artificial intelligence (AI) in higher education institutions (HWI) is one of the most dynamic technological advances that is likely to influence the field of higher education (Dwivedi et al., 2021). The present time, the adaptability of AI in different areas, such as adaptive learning system, analysis of student performances, research data management, and automation of administration is being explored (Dwivedi et al., 2021). However, for the successful adoption of AI technologies, leadership, organizational readiness, and adequate digital infrastructure are essential.

Digital leadership is thus essential in helping institutions to embrace AI technologies and incorporate them into their academic and administrative operations. Leaders who encourage digital innovation can pave the way for institutional preparedness to embrace technology and inspire the use of cutting-edge technology. AI technologies can then facilitate a transformation in the organization in higher institutions of learning. Organizational transformation is the process of which institutions are changing their processes, structures and strategies based on technological and environmental changes (Carmo et al., 2025). In universities, this transformation could involve the adoption of electronic learning platforms, decision-making systems that rely on

data, and governance frameworks that integrate technology. Within the Indian context, recently technology integration and innovation have been highlighted in policy changes and in institutional reports as the key areas to boost the higher education ecosystem. The use of emerging technologies, upgrading digital infrastructure and fostering research innovation are encouraged to increase institutional competitiveness. In addition, internationalization efforts through national policy documents emphasize the need to join forces internationally, innovate with technology and engage in interdisciplinary education to enhance the international position of Indian universities (Joshi, 2023).

Therefore, the digital technologies and AI systems play a crucial role in enhancing the competitiveness of institutions and in enabling their engagement in global knowledge networks. Based on these academic and empirical results, this research proposes a conceptual model between digital leadership, the use of AI in HEIs, organizational change, and institutional competitiveness. Based on the reviewed literature, the study develops a conceptual framework to illustrate how the four variables DLoL, AI adoption, organisational transformation and institutional competitiveness will relate to each other. The conceptual framework of the study is illustrated in the following fig. 1, which shows the relationships hypothesized in the study in terms of digital leadership, use of artificial intelligence, organizational transformation and institutional competitiveness in HEIs.

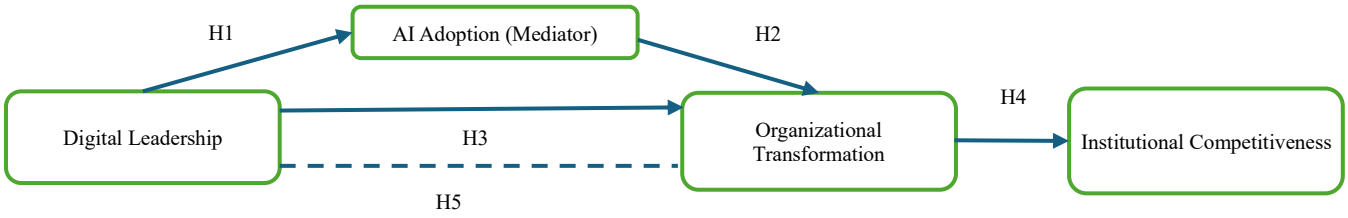

Fig. 1 Conceptual Framework and Hypothesized Relationships Among Digital Leadership, AI Adoption, Organizational Transformation, and Institutional Competitiveness

The suggested framework states that through digital leadership, an institution acquires AI-based technology, which in turn results in organizational transformation and makes the higher education institution more competitive on a global level.

III. Theoretical Foundations Supporting the Framework

The proposed framework is supported by two major theoretical perspectives.

3.1 Dynamic Capability Theory

Dynamic capability theory describes how organizations acquire the ability to adjust to fast changing environment through integration, configuration, and reconfiguration of the internal and external resources (Teece, 2018). Digital leadership can be regarded as a dynamic capability that allows institutions to embrace new technologies based on artificial intelligence and bring about organizational transformation.

3.2 Technology–Organization–Environment (TOE) Framework

TOE framework explains the technological adoption process within an organization in light of three aspects, namely technological readiness, organizational attributes, and environment (Baker, 2011). Leadership capabilities in higher education institutions can be seen as an organizational aspect influencing technological adoption.

IV. Hypothesis Development

Digital leadership is essential for organizations to embrace and leverage new technologies, as it drives innovation, technology resource mobilisation and strategic technological vision. In higher education, digitally competent leaders help to implement AI-powered systems, predictive analytics, and automated administrative procedures. This type of leadership, therefore, is expected to positively affect the implementation of AI in higher education institutions (H1). AI technologies improve the efficiency of institutions by automating processes, making data-driven decisions and developing customized learning systems (Dwivedi et al., 2021). It has applications in higher education to support adaptive learning, student analytics, and research management. The technological shifts frequently need a reorganization of the organization processes and governance systems. The National Education Policy also is focused on digital transformation for increased educational achievements and research productivity (Joshi, 2023). In this context, it is expected that the use of AI will have a positive impact on organizational transformation (H2).

Digital leadership also has a direct impact on organizational transformation through the promotion of interdisciplinary collaboration, digital integration in institutional processes, and innovation (H3). Additionally, organizational transformation enhances institutional competitiveness through research capacity development, building partnerships with global institutions, and institutional internationalization (Joshi, 2023), which contributes to H4. Lastly, AI use could be a mediating process that links digital leadership to organizational transformation, where the use of technology creates structural and operational changes within the organization, supporting H5.

H1: Digital leadership positively influences AI adoption in higher education institutions.

H2: AI adoption positively influences organizational transformation in higher education institutions.

H3: Digital leadership positively influences organizational transformation in higher education institutions.

H4: Organizational transformation positively influences the global competitiveness of higher education institutions.

H5: AI adoption mediates the relationship between digital leadership and organizational transformation.

V. RESEARCH METHODOLOGY

5.1 Research Design

The research methodology used in this research study involves quantitative research approach to investigate the connection between digital leadership, use of AI and organizational transformation in the context of higher education institutions and organizational competitiveness. Research studies related to technology adoption and organizational transformation have always been done using quantitative approaches because it facilitates use of statistics to empirically examine the relationship between various theoretical concepts. Data was collected through a cross-sectional survey method that involved collecting information from respondents in one instance only. This method can be applied to examine attitudes about digital transformation and technology adoption within an organization. In order to analyze the proposed model, structural equation modeling based partial least squares approach was adopted as it was appropriate for exploratory study involving complex models and relatively small sample size.

5.2 Target Population and Sampling

The study focused on faculty members, higher education academic administrators, organization's leadership and head of the IT and digital transformation team in higher education institutions in India. These were considered appropriate because it was part of the immediate sphere of activity in institutional management, teaching and technologic implementation. Data was collected between March and April 2026. A total of 65 valid responses were received from Higher education professionals of University & Colleges in India. This data set contains 20 measures under the following constructs: digital leadership (5 items), AI adoption (5 items), organizational transformation (5 items) and institutional competitiveness (5 items). The respondents were selected using purposive sampling technique in order to have knowledge about digital technologies and institutional transformation process. Subjects were recruited through professional academic networks, institutional email lists and faculty research groups. The respondents were chosen because of their involvement in institutional governance, digital projects, teaching or governing in higher education institutions, and the involvement was voluntary. The relatively small sample size does not affect the applicability of using PLS-SEM, as PLS-SEM allows reliable parameter estimates and predictive results even for small to medium-sized studies. The minimum sample size was also calculated based on the 10-time rule, which is the maximum number of structural paths that lead to a latent construct in the model multiplied by 10. This model has a maximum of 2 arrows pointing to a construct, and a minimum of 20 is needed to examine in this model, which can be obtained with a sample size of 65.

5.3 Ethical Considerations

Data gathering was conducted in line with ethical considerations. Respondents were ensured anonymity since it was free to opt out and were also informed about the nature of the survey being academic and aimed at gathering data. No personal information was sought since the answers given were to be anonymous to ensure confidentiality. Data gathered were stored safely and only used for scholarly purposes. Additionally, the respondents were made aware of their rights to exit the survey at will without being penalized for opting to do so. This was done to ensure that standard ethical considerations in social sciences are met. Social sciences studies with human subjects adhere to ethical considerations.

5.4 Data Analysis Technique

The conceptual framework of the study was modeled using the software that uses partial least squares structural equation modeling (PLS-SEM). The reason why PLS-SEM is extensively used in the field of management and technology adoption research is due to its suitability when dealing with multiple constructs and relationships in the model and its capability of producing good results even with a relatively small sample size. To perform PLS-SEM on the conceptual framework of the study, the following parameter settings were applied using SmartPLS 4 software: path weighting scheme, maximum iteration of 300, stop criterion of $1\times10\text{-}7$ and bootstrapping with 5000 samples.

The analysis that was conducted was of the two-step analysis as recommended by the authors, which consisted of an evaluation of the measurement model followed by an assessment of the structural model. First, the measurement model was evaluated to assess the reliability and validity of the constructs. Internal consistency reliability was tested using Cronbach's Alpha and Composite Reliability while convergent validity was determined using the Average Variance Extracted (AVE) technique. In addition, the discriminant validity was checked using the heterotrait-monotrait ratio (HTMT). The next phase involved testing the structural model and verifying the hypothesis relationships between the constructs. Path coefficients' values were estimated using bootstrapping, which entails conducting resampling 5000 times. This helps to obtain accurate values for standard error and confidence interval

estimations. The predictive ability of the model was evaluated using coefficient of determination and the effect size while the model fit was estimated using Standardized Root Mean Square Residual (SRMR). This is one way to evaluate construct properties and construct relationships in the research model.

5.5 Measurement of Constructs

Measuring instruments employed in this study were multi-item scales provided with the arrangement of the contents in accordance to the previous studies to obtain the content validity and reliability. Each item of measurement was rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree. The items of measurement were slightly adapted to the context of the higher education institutions.

Digital Leadership

Digital leadership is the degree to which institutional leaders foster digital innovation, digital integration and digital capability development in the institution. Digital transformation involves leadership, and it is crucial to realize that leadership is about vision, technological experimentation and resource allocation for digital initiatives.

Sample items include:

- The use of digital technologies is promoted in teaching and research in the institution by its leaders.
- Leaders of institutions are supportive of digital innovation programmes.
- Leadership encourages the building of digital skills in the institution.

This is adapted from the digital leadership scale from previous study.

Artificial Intelligence Adoption

The AI adoption rate is the degree to which HEIs are using AI-based technologies in educational and administrative functions. AI adoption can help institutions make better decisions, automate repetitive tasks, and optimize their operations using intelligent systems.

Sample items include:

- Use AI tools in institution for study or office purposes.
- Physical and chemical properties are measured, and the main movements in the institution are supported by AI technologies.
- AI enhances the efficiency of operations.

The measurement items were adopted from previous studies on AI adoption in organisations and digital technology in organisations (Dwivedi et al., 2021).

Organizational Transformation

Organizational transformation: Structural and/or operational changes resulting from the integration of digital technologies in the institutional processes. Digital transformation initiatives allow institutions to be agile in the face of technology change, to be more efficient at the institutional level, and to rethink institutional processes.

Sample items include:

- Digital technologies have made a significant impact on institutional processes.
- People are regularly updating institution to meet the changes in technology.
- Institutional efficiency has been enhanced through digital transformation initiatives.

The scale for organizational transformation was adapted from previous studies. The sources of constructs and measurement items are provided in table I.

TABLE I SOURCE OF CONSTRUCTS

S. No	Construct	Items	Source
1	AI Adoption	AI1–AI5	Dwivedi et al., (2021)
2	Organizational Transformation	OT1–OT5	Elia et al., (2024)
3	Institutional Competitiveness	IC1–IC5	Joshi & Ahir, (2019)

Institutional Competitiveness

Institutional competitiveness is the capacity of higher education institutions to increase their international boundaries and make better progress with technological innovation and digital transformation to improve their global reputation, research productivity and international cooperation.

Sample items include:

- The use of digital technologies has enhanced institution's global reputation.
- The school is working with foreign partners on line.
- Widespread use of technology has increased research productivity.

The items were based on the idea of internationalization and institutional competitiveness in higher education that was proposed.

5.6 Data Analysis Techniques

The collected data will be analyzed in this study by means of Structural Equation Modeling (SEM) which is used to examine the relationship between the study variables.

The analysis will include the following steps:

- Descriptive statistics summarising characteristics of the respondents.
- Reliability analysis was conducted to test internal consistency of the items of the questionnaire by Cronbach's alpha.
- Confirmatory factor analysis (CFA) for assess construct validity.
- Structural equation modeling (SEM) testing the hypotheses proposed.

Theoretical testing of multiple relations between latent constructs and testing of multiple theoretical models, make SEM a particularly suitable tool for this study for the data analysis.

5.7 Performance Metrics and Evaluation Criteria

In order to test the measurement and structure models, various performance metrics have been used that are commonly applied in the context of PLS-SEM based analysis. These metrics include Cronbach's Alpha, Composite Reliability, Average Variance Extracted (AVE), Coefficient of Determination (R^2), and Effect Size (f^2).

Cronbach's Alpha

$$\alpha = \frac{k}{k-1}\left(1-\frac{\sum\sigma_i^2}{\sigma_t^2}\right) \qquad (1)$$

Internal consistency of reliability is determined by Cronbach's Alpha (α) (Equation 1). Internal consistency reliability is considered reliable when its value exceeds 0.70.

Composite Reliability (CR)

Equation 2 used to measure construct reliability in **PLS-SEM**.

$$CR = \frac{(\sum\lambda)^2}{(\sum\lambda)^2+\sum(1-\lambda^2)} \qquad (2)$$

Where,

λ = factor loading.

Composite Reliability is determined from equation (2). Composite Reliability determines the consistency reliability of constructs in Structural Equation Modeling. Composite Reliability exceeding 0.70 is regarded as reliable.

Average Variance Extracted (AVE)

Used for convergent validity.

$$AVE = \frac{\sum\lambda_i^2}{n} \qquad (3)$$

Average variance extracted (AVE) tests convergent validity through determining the proportion of variance accounted for by the construct compared to measurement errors. Values higher than 0.50 signify good convergent validity. Average Variance Extracted (AVE) is determined using equation (3).

Coefficient of Determination (R^2)

This measures predictive power of the model.

$$R^2 = 1 - \frac{SS_{res}}{SS_{tot}} \qquad (4)$$

Where,

SS_{res} = residual sum of squares

SS_{tot} = total sum of squares.

Coefficient of determination (R^2) determines the variance in the endogenous constructs accounted for by exogenous variables. The higher the value, the better the predictive power of the model. Coefficient of Determination (R2) is determined using equation (4).

Effect Size (f^2)

Used to measure strength of relationships between constructs. Equation (5) is used to calculate the effect size (f^2).

$$f^2 = \frac{R^2_{included}-R^2_{excluded}}{1-R^2_{included}} \qquad (5)$$

In Structural Equation Modeling, the strength of impact of independent variable with dependent variable is measured using the term effect size (f^2). The traditional interpretation of an f^2value of 0.02 is a small effect, which means that the predictor has relatively little influence on the outcome variable. $f^2$of 0.15 indicates a moderate effect, or level of influence. When $f^2 \geq 0.35$, there is a large effect, meaning that the predictor has a significant effect on the dependent variable.

Standardized Root Mean Square Residual (SRMR)

Model fit indicator.

$$SRMR = \sqrt{\frac{\sum(r_{ij}-\hat{r}_{ij})^2}{k}} \qquad (6)$$

The standardized root mean square residual (SRMR) is a measure of the difference between the observed and the expected correlation. SRMR values less than 0.10 show that the model fits well. Equation (6) is used for determining the standardized root mean square residual (SRMR).

5.8 Analytical Workflow

The analysis process was carried out through six sequential processes:

1. Data screening and coding of data collected from the survey instrument.
2. Descriptive analysis of the demographics of the respondents.
3. Reliability analysis based on the alpha coefficients and composite reliability.
4. Convergent validity analysis based on Average Variance Extracted (AVE).
5. Discriminant validity analysis based on HTMT ratio.
6. Structural model analysis through bootstrapping.

VI. Data Analysis and Results

Analysis of the suggested research model was done using Partial Least Squares Structural Equation Modelling (PLS-SEM) through SmartPLS Version 4. This research is done in the two phases that included measurement model and structural model analysis.

6.1 Respondent Profile

Descriptive Statistics was used to give a description of the demographic profile of the respondents of the questionnaire. The respondents of this study include Faculty Members, Academic Managers, Institutional Heads, Research Scholars and Staff members who have been involved in the activities of IT or Digital Transformation in higher education institutes. The demographic characteristics considered for this study include gender of respondent, professional role, years of experience in profession and nature of institute. The following table II presents the demographic profile of the survey respondents.

TABLE II RESPONDENT PROFILE OF SURVEY PARTICIPANTS (N = 65)

Variable	Category	Frequency	Percentage
Gender	Male	34	52.3%
	Female	31	47.7%
Current Role	Faculty member	45	69.2%
	Academic administrator	4	6.2%
	Institutional leader	2	3.1%
	Research scholar	4	6.2%
	IT / Digital transformation staff	2	3.1%
	Other professional roles	8	12.2%
Years of Professional Experience	Less than 5 years	10	15.4%
	5–10 years	20	30.8%
	11–20 years	22	33.8%
	Above 20 years	13	20.0%
Type of Institution	Public university	15	23.1%
	Private university	21	32.3%
	Deemed university	10	15.4%
	Autonomous college	19	29.2%

According to the profile of the respondents, most of the respondents are the university faculty members, accounting for 69.2%. This is because play an important role as educators, researchers, and administrators in terms of digital innovation in higher education institutions. As far as the distribution of gender is concerned, the males form the majority of the respondents, representing 52.3%, while the females make up 47.7% of the total number of the respondents. The majority of respondents had between 5 and 20 years of professional experience; therefore, it have a good knowledge about how the process of institutional governance works in technology.

6.2 Measurement Model Assessment

The test for reliability analysis and construct validity was done to ascertain the reliability and validity of the constructs used in this study. Reliability was tested using Cronbach's alpha and composite reliability, while convergent validity was determined through the calculation of average variance extracted (AVE). From the results generated, the level of reliability in terms of internal consistency of all the constructs is satisfactory. This is indicated by a range of Cronbach's alpha of 0.862 to 0.941, higher than the conventional benchmark value of 0.70. Also, a range of composite reliability of 0.900 to 0.955 indicates internal consistency of the constructs.

Convergent validity of the constructs was assessed through computation of AVE. The value of AVE for all constructs ranges from 0.643 to 0.811, more than the minimum value of 0.50. This implies that each construct explains a variance of at least 50% of its indicator. Table III presents the results of test of reliability and convergent validity for measurement model.

TABLE III MEASUREMENT MODEL RELIABILITY AND VALIDITY

Construct	Cronbach's Alpha	Composite Reliability	AVE
Digital Leadership	0.941	0.955	0.811
AI Adoption	0.862	0.900	0.643
Organizational Transformation	0.908	0.931	0.729
Institutional Competitiveness	0.927	0.945	0.774

The findings above are evidence that the measurement model conforms to the standards set for reliability and convergent validity

6.3 Discriminant Validity

The test for discriminant validity involved heterotrait – monotrait ratio (HTMT). As per the standards established, it is expected that discriminant validity values must be below 0.85. From the results above, it is evident that all the HTMT values are below the established threshold, and hence all the constructs can be empirically distinguished from each other. Table IV shows discriminant validity using heterotrait-monomethod ratio (HTMT).

TABLE IV DISCRIMINANT VALIDITY (HTMT)

Constructs	Value
AI Adoption – Organizational Transformation	0.699
AI Adoption – Digital Leadership	0.608
AI Adoption – Institutional Competitiveness	0.564
Organizational Transformation – Digital Leadership	0.688
Organizational Transformation – Institutional Competitiveness	0.606
Digital Leadership – Institutional Competitiveness	0.466

These findings confirm that discriminant validity is established.

6.4 Structural Model Assessment

Path coefficients, t-values, p-values, coefficient of determination R^2, and effect sizes were used in estimating the structural model.

A bootstrapping analysis was carried out with the help of 5000 samples to establish whether any form of significance exists between the hypotheses tested. The output of the structural model analysis using the path coefficients and t-values is given below in table V.

TABLE V STRUCTURAL MODEL RESULTS

Hypothesis	Path	β	T value	P value	Result
H1	Digital Leadership → AI Adoption	0.565	5.131	0.000	Supported
H2	AI Adoption → Organizational Transformation	0.388	3.532	0.000	Supported
H3	Digital Leadership → Organizational Transformation	0.426	3.726	0.000	Supported
H4	Organizational Transformation → Institutional Competitiveness	0.578	6.400	0.000	Supported

The findings suggest that all hypothesized relationships are statistically significant. Digital leadership is found to have a significant impact on AI and organizational transformation. Also, AI has a significant effect on organizational transformation, and organizational transformation positively impacts organizational competitiveness. Fig. 2 shows the structural model with path coefficients derived through PLS-SEM analysis.

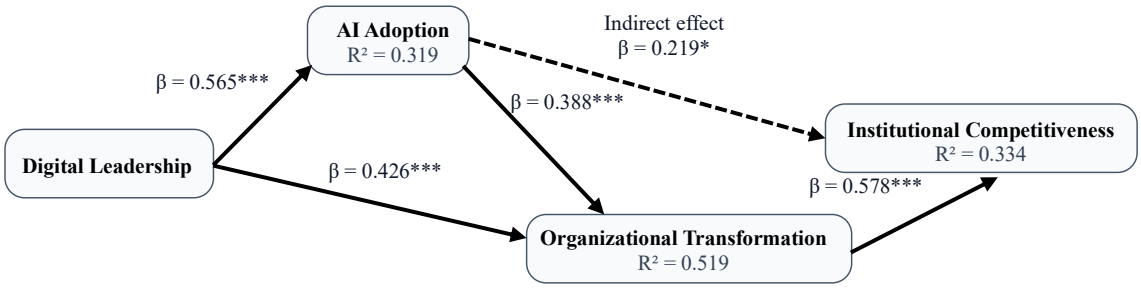

Fig. 2 Structural Model with Path Coefficients

Fig. 2 highlights the structural relations among digital leadership, AI implementation, organizational transformation, and institutional competitiveness. The values shown on the arrows denote the standardized path coefficients (β) calculated through PLS-SEM, whereas the R^2 values in the constructs show the amount of variance explained by the proposed model. From the findings, it is clear that digital leadership has a significant effect on AI implementation and organizational transformation, while AI implementation also positively impacts organizational transformation. Organizational transformation plays an important role in boosting institutional competitiveness. Also, AI implementation acts as a mediator between digital leadership and organizational transformation.

Note: β = standardized path coefficient; R^2 = coefficient of determination. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Results obtained using PLS-SEM with bootstrapping (5000 subsamples). Fig. 3 illustrates the strength of the relationships between digital leadership, AI adoption, organizational transformation, and institutional competitiveness based on the standardized path coefficients obtained from the PLS-SEM analysis.

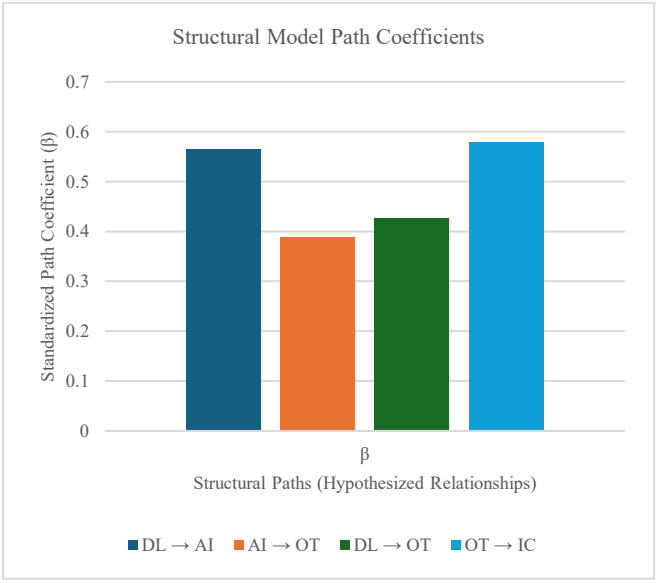

Fig. 3 Structural Path Coefficients

Note: β = standardized path coefficient. Results obtained using PLS-SEM with bootstrapping (5000 subsamples).

6.5 Coefficient of Determination (R^2)

The accuracy of prediction of the model was done through the coefficient of determination (R^2). Table VI contains the coefficient of determination (R^2) showing the predictive ability of the structural model.

TABLE VI COEFFICIENT OF DETERMINATION

Construct	R^2	Adjusted R^2
AI Adoption	0.319	0.308
Organizational Transformation	0.519	0.503
Institutional Competitiveness	0.334	0.324

Results show that digital leadership accounts for 31.9% of variation in AI adoption. Moreover, digital leadership and AI adoption together account for 51.9% of variance in organizational transformation, which suggests considerable explanatory strength. Organizational transformation accounts for 33.4% of variation in institutional competitiveness, implying some predictive strength.

6.6 Mediation Analysis

Mediation effect of AI adoption was established using the bootstrapping method. From the findings, it is evident that AI adoption plays an intermediary role between digital leadership and organizational transformation. The findings of the mediation test showing the mediating effect of AI adoption between digital leadership and organizational transformation are presented in table VII.

TABLE VII MEDIATION RESULTS

Relationship	Indirect Effect	T value	P value	Result
Digital Leadership → AI Adoption → Organizational Transformation	0.219	2.445	0.014	Supported

This finding implies that digital leadership impacts organizational change to some extent through the adoption of AI.

6.7 Effect Size (f^2)

Effect size was computed in order to measure the impact of exogenous variables on the endogenous ones. Table VIII is presented the interpretation of effect size (f^2)

According to Cohen's guidelines:

TABLE VIII EFFECT SIZE (f^2)

S. No	Value	Effect
1.	0.02	Small
2.	0.15	Medium
3.	0.35	Large

The findings reveal that the relationships in the proposed model exhibit small to moderate effect sizes, implying that digital leadership and artificial intelligence adoption have substantial impact on organizational transformation and institutional competitiveness.

6.8 Hypothesis Testing Summary

TABLE IX SUMMARY OF HYPOTHESIS TESTING

Hypothesis	Relationship	Path Coefficient (β)	T value	P value	Decision
H1	Digital Leadership → AI Adoption	0.565	5.131	0.000	Supported
H2	AI Adoption → Organizational Transformation	0.388	3.532	0.000	Supported
H3	Digital Leadership → Organizational Transformation	0.426	3.726	0.000	Supported
H4	Organizational Transformation → Institutional Competitiveness	0.578	6.400	0.000	Supported
H5	Digital Leadership → Organizational Transformation (via AI Adoption)	0.219	2.445	0.014	Supported

Significance of the hypothesized relationships was evaluated using the Bootstrapping approach in SmartPLS using 5000 replications. It is clear from the results that the significance level of all the hypothesized relationships is highly significant. Hypothesis Testing Results table IX.

6.9 Model Fit

The assessment of fit for the model used in the research was carried out through the use of the Standardized Root Mean Square Residual (SRMR). The SRMR score for the model estimated was 0.098, which falls below the criterion score of 0.10, signifying that the model estimated shows fit in the research. The discrepancy index of d_ULS was also considered. The estimated value for the model (2.019) is smaller compared to the bootstrap 95% confidence interval of 2.117.

VII. DISCUSSION

The present study aimed to analyze the role of digital leadership in promoting the integration of AI in the world of higher education and promote organizational change, with the aim of improving the competitiveness of the institution. Results indicate that digital leadership has a positive effect on AI adoption, signifying the leadership's critical role in facilitating the integration of AI. Leaders who are digitally-minded promote experimentation and make resources available for digital projects, while nurturing innovation. Previous research also highlights leadership commitment in promoting technology adoption and digitalization. The use of AI plays a crucial role in the organization's transformation by enhancing decision-making, automating administrative tasks, and implementing data-driven management (Dwivedi et al., 2021). But there are still ethical issues like privacy and algorithmic bias to

consider (Udhubi et al., 2025). Digital leadership also has a direct impact on the transformation of an organization through vision, fostering innovation and establishing digital culture in institutions. Resulting organizational transformation further bolsters institutions' competitiveness in terms of academic excellence, efficiency and international prestige. Internationalization and technological advances continue to be important competitiveness levers (Joshi, 2023). In addition, AI use is linked to organizational transformation via digital leadership, suggesting that digital leadership impacts organizational transformation, in part, by enabling intelligent systems and data-driven processes. The proposed relationships were compared with previous research to validate the relationships and to place the contributions in the context of previous research. Table X shows the comparative analysis of the present study with existing works.

TABLE X COMPARATIVE ANALYSIS OF THE PRESENT STUDY WITH PREVIOUS RESEARCH

Study	Context	Method	Key Findings
Elia et al. (2024)	Digital transformation	Conceptual	Technology adoption drives organizational change
Dwivedi et al. (2021)	AI adoption	Empirical	AI enhances decision-making capability
Present Study	Higher education institutions	PLS-SEM	Digital leadership drives AI adoption and organizational transformation

Generally, the study shows how important it is for universities and higher learning institutions to embrace strategic leadership and technology to secure their future. Higher learning institutions that adopt digital leadership strategies together with artificial intelligence technologies have higher chances of transforming themselves and maintaining competitive advantage in the modern educational system.

7.1 Implications for Higher Education Leadership

These empirical results have a significant influence on how leadership should be practiced in institutions of higher learning. The empirical findings reveal that digital leadership accounts for 31.9% of AI adoption and that 51.9% of organizational transformation is accounted for by the combination of digital leadership and AI adoption. This reveals that leadership-facilitated technology plays a key role in enabling institutions of higher learning to adopt digital transformation. Leaders within institutions that foster innovation and experiment with technology are able to adopt artificial intelligence. The current study contributes to the body of knowledge in the area of digital transformation in higher education through investigation of associations between digital leadership, AI adoption, organizational transformation, and institutional competitiveness as components of an integrated concept. Based on empirical evidence, digital leadership has been found to be an important determinant of AI adoption and organizational transformation. As such, the results emphasize the role played by leaders in technological advancement within an institution. In addition, this research adds to organizational transformation theories through highlighting the need to integrate digitalization processes into management, administration, and academics for increased institutional effectiveness and competitiveness. Practically, the results imply that institutions should focus on enhancing their digital leadership competencies, adopting AI technology, and aligning technology-related activities to institutional policies to foster digitalization. From a policy point of view, policymakers should promote technology-enabled learning and cooperation between industry and academia as mechanisms for enhancing institutional performance, adaptation, and competitiveness. According to the findings, digital leadership accounts for 31.9% of the variance in AI adoption while digital leadership and AI adoption together explain 51.9% of organizational transformation variance.

VIII. CONCLUSION

Digital technologies are advancing quickly, transforming the higher education landscape in the world, and institutions are forced to create new strategies and approaches to improve their institutional performance and competitiveness. The connections between digital leadership, artificial intelligence (AI) adoption, organizational transformation, and institutional competitiveness in HEIs was explored. The empirical results support that digital leadership is important for technological change in HEIs. The results show that digital leadership has a significant impact on AI adoption ($\beta = 0.565, p < 0.001$) and organizational transformation ($\beta = 0.426, p < 0.001$). Furthermore, the use of AI positively affects organizational transformation ($\beta = 0.388, p < 0.001$), and the institutional competitiveness is significantly impacted by organizational transformation ($\beta = 0.578, p < 0.001$). The coefficient of determination results also shows that digital leadership accounts for 31.9% of the variance in the adoption of AI, and digital leadership and AI adoption together account for 51.9% of the variance in organizational transformation. This study underscores the importance of leadership to drive technological adoption as one of the key drivers for digital transformation in HEIs. The study also revealed that digital leadership had a mediating effect between digital transformation and the adoption of AI. The findings indicate that leadership efforts contribute to institutional change in part by the promotion and incorporation of AI-enabled technologies. Organizations that successfully harness technological efforts led by their leaders are therefore more likely to make significant organization change and remain competitive in the increasingly digital academy. The study has a few limitations and can be expanded upon in the future. Longitudinal studies would be useful for future research to investigate the causal relationship between leadership ability and technological adoption over time. It is possible that comparative studies conducted at various countries or institutional environments could yield general conclusions on

digital transformation in higher education. Further, the study could include other factors like the digital culture, readiness of the institutions and technological infrastructure for further understanding the mechanisms affecting the organizational transformation through the use of AI.

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