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DIGITAL TRANSFORMATION AND ADMINISTRATIVE EFFICIENCY IN PERUVIAN PUBLIC UNIVERSITIES

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ABSTRACT

Digital transformation is a strategic element in the modernization of public university management, as it affects the optimization of administrative processes and institutional efficiency. Therefore, the objective of this study was to determine the relationship between digital transformation and administrative efficiency in public universities in Peru. In this sense, the research was developed under a quantitative approach, with a non-experimental design, of a basic type and correlational scope. For this, the sample was made up of administrative staff from public universities, selected through non-probabilistic sampling. A structured questionnaire was applied for data collection, whose validity was determined by expert judgment and whose reliability reached acceptable levels according to Cronbach's alpha coefficient. The results showed the existence of a statistically significant relationship between digital transformation and administrative efficiency (Spearman's Rho 0.764; $p = 0.001$), which indicates that the increase in digital transformation is associated with greater efficiency in administrative processes. It is concluded that digital transformation is positively related to administrative efficiency in public universities in Peru.

Keywords: Digital transformation, university management, administrative efficiency, public innovation, public universities, digital skills.

1 INTRODUCTION

In recent years, digital transformation (DT) has established itself as a relevant process in contemporary public management, particularly in higher education institutions, where increasing administrative complexity requires more efficient management mechanisms.

According to the Economic Commission for Latin America and the Caribbean (2022), the digitalization of public services is associated with improvements in productivity and transparency. Therefore, in public universities, the digitization of administrative processes is presented as a strategy aimed at optimizing the use of resources, reducing service times and improving the quality of institutional service.

In the Peruvian context, Law No. 1412 on Digital Government and the National Digital Transformation Policy for 2030 promote the adoption of information technologies in public entities, including universities. These policies seek to integrate digital tools into public management, promote interoperability, and strengthen the technological skills of public servants (Presidency of the Council of Ministers, 2023).

However, the level of progress of digital transformation in these institutions is heterogeneous, which is reflected in differences in the efficiency of administrative processes and in the institutional capacity to respond to the demands of the university community, due to factors such as limited technological infrastructure, lack of investment in innovation, and the scarce digital culture of administrative workers (Fang and Wei, 2025).

Various studies carried out in the field of public and educational management, such as those by researchers Cueva (2020), Silva et al., (2025), Nita and Gutu (2023), have pointed out the existence of significant associations between the use of digital technologies and administrative efficiency, highlighting that digitalisation is linked to improvements in document management, internal coordination and user service.

However, in the case of public universities in Peru, especially in the recently created ones, it is observed that there is a gap between the design of digital strategies and their practical execution, which has a direct impact on administrative efficiency and user satisfaction. Therefore, according to López (2022) is able to measure digital transformation through its dimensions of digital culture, digital platforms, and digital competence of personnel. Meanwhile, Chiavenato says that administrative efficiency is measured through the optimization of resources, continuous improvement of processes and the measurement of productivity. (1999)

In this sense, it is pertinent to verify the relationship between digital transformation and administrative efficiency in the country's public universities, from a quantitative and correlational approach, which allows scientific evidence to be provided to the debate on the modernization of university institutional management. Therefore, the objective of this study is to determine the relationship between digital transformation and administrative efficiency in public universities in Peru.

Digital Transformation in Public Universities in Peru

In Peruvian public universities, the degree of digital transformation (TD) is uneven and is subject to institutional, budgetary and technological factors. While some institutions have managed to develop integrated management platforms, online services, and administrative automation systems, others still rely on manual or partially digitized processes (Han et al., 2024). This situation is due to the inequitable availability of technological infrastructure, the lack of connectivity outside Lima and the constant low investment in institutional modernization.

The development of TD in these universities depends to a large extent on the national legal framework. Among the regulations, Law No. 1412 on Digital Government, Legislative Decree 1412, the National Policy for Digital Transformation to 2030 and the guidelines of the Ministry of Government and Digital Transformation, which are the guiding framework for public entities to digitize their processes and achieve interoperability between systems, stand out. It is worth mentioning that universities such as UNMSM and UNI are more advanced in digital adoption due to the budget they manage, the trained staff they have access to and the trajectory they have. On the other hand, young universities or universities located in remote areas have greater structural obstacles. These differences show that TD in the Peruvian university system is in an intermediate stage of maturity, with advances, but also with gaps that must be addressed from public policies and institutional management.

Administrative efficiency of administrative staff

Administrative efficiency in public universities is increasingly linked to the correct use of technologies that facilitate the optimization of internal processes and the improvement of user service (Marcos et al., 2024). In this sense, the implementation of digital systems in document management, internal communication, and service processing helps to shorten response times, reduce errors, and raise the

quality of service (Rizzo et al., 2025). In this framework, the administrative team plays a key role, since the efficiency of technological tools depends on their degree of appropriation and digital skills (Mekonnen et al., 2024).

While technology provides obvious opportunities to increase efficiency, its effect varies depending on the ability of employees to adjust to different management scenarios. Indeed, the lack of training, opposition to change and the continuity of traditional bureaucratic practices slow down the process of digital transformation. For this reason, the promotion of digital skills and the creation of an organizational culture focused on innovation are essential to establish effective university management in line with the current demands of the public sphere.(Ombolo, 2025)

Progress and challenges for institutional management

Digitalisation has made it possible for several public universities to improve their administrative services, expand their digital platforms and establish procedures that make communication with students, teachers and citizens easier (Badajoz et al., 2022). These developments constitute a significant step towards the modernization of institutions and the development of management models that are more flexible, transparent and user-centric. However, the institutionalization of fully digital management faces numerous challenges.

The main difficulties include poor interoperability between institutional systems, gaps in technological infrastructure, limited budget to sustain innovation projects, and lack of specialized staff training. In addition, resistance to change and poor coordination between administrative areas hinder the implementation of comprehensive digital strategies. In this situation, it is essential to strengthen institutional leadership, promote change management, and ensure sustainable resources that make it possible to move towards a digital transformation that serves the real needs of the

public university system (Santana et al., 2024).

The conceptual model of the study states that digital transformation, through its dimensions of digital culture, digital platforms and digital competence of personnel, favors the digitization of administrative processes and the use of technological platforms, thus relating to improvements in administrative efficiency in compliance with the stages of the administrative process, reflected in the optimization of time, the management of resources and the quality of institutional service.

2 METHODS

The study adopted a quantitative, basic approach and correlational scope, with a non-experimental cross-sectional design due to temporal and operational constraints. This approach made it possible to analyze the relationship between digital transformation and administrative efficiency in public universities in Peru, without manipulating the study variables (Hernandez et al., 2014).

The population was made up of the public universities of Peru recognized by the National Superintendence of University Higher Education (SUNEDU). The selection of the institutions was carried out through a non-probabilistic sampling of an intentional-criterial type, considering theoretical and contextual criteria relevant to the analysis of digital transformation in university management.

The selection criteria were: (a) geographical diversity, operationalized through the inclusion of universities located in different macro-regions of the country (central coast, north coast and south-Andean highlands); (b) institutional seniority, classified in universities of high seniority (more than 100 years), intermediate seniority (between 40 and 100 years) and recent creation (less than 40 years); and (c) level of technological implementation, determined from the existence of institutional administrative management platforms, virtual processing systems and digital services available to the user, according to public institutional information.

Table 1 Selection criteria for the public universities included in the study

Universities	Geographical diversity (macroregion)	Institutional seniority (category)	Level of technology implementation
UNMSM	Central Coast	High antiquity (creation 1551)	High
UNI	Central Coast	High antiquity (Creation 1876)	High
UNSA	Southern highlands	High antiquity (Creation 1828)	High
UNA-Puno	Southern Andean highlands	High antiquity (created 1856)	Medium
UNP	North Coast	Intermediate seniority (Creation 1961)	Medium
UNAB	North Coast	Recent creation (Created 2010)	Basic-Medium

Note. Own elaboration (2025), based on the University Ranking of the IV Biennial Report 2021-2022 of SUNEDU

Based on these criteria, the National University of San Marcos (UNMSM) was selected for its high

position in institutional standards, the National University of Engineering (UNI) for its technical and

scientific approach; the National University of San Agustín de Arequipa (UNSA), the National University of the Altiplano (UNA-Puno) and the National University of Piura (UNP) to contrast a model of administrative management in a different regional context, and the National University of Barranca (UNAB) for being the first university in the Lima Region to obtain institutional licensing, which allow to capture different levels of institutional and technological development within the public university system Peruvian.(SUNEDU, 2025)

The sample consisted of 230 administrative workers, selected through non-probabilistic sampling for convenience, considering their direct link with institutional administrative processes. Although the sample size is not for statistical generalization purposes, it is suitable for correlational studies of basic scope, allowing the identification of statistically significant associations between the variables analyzed, according to minimum criteria of statistical power reported in the methodological literature.

The participants were characterized according to sociodemographic and labor variables, such as age, administrative position, institutional seniority, functional area and level of digital skills, in order to contextualize the results obtained and facilitate their interpretation.

The technique for collecting information was a structured virtual survey, applied to a group of 230 administrative workers and specialists in digital transformation belonging to the selected universities. The instrument consisted of 24 items on the Likert scale, distributed in two variables: level of digital transformation (digital culture, digital platforms and digital competence of the staff) and administrative efficiency (optimization of resources, improvement of processes and productivity).

The validity of the instrument was established through expert judgment, while reliability was determined through Cronbach's alpha coefficient, obtaining values (0.960) that show adequate internal consistency. For the analysis of the data, descriptive statistics, SPSS v.26 software and Spearman's Rho correlation coefficient were used, considering a significance level of 5%, due to the non-parametric nature of the data.

During the development of the study, the principle of confidentiality, the voluntary participation of the respondents and the protection of personal data were guaranteed, in accordance with Law No. 29733 on the Protection of Personal Data. In addition, the principles of beneficence, justice and scientific transparency were respected, avoiding any conflict of interest or manipulation of results.

3 RESULTS

The results obtained made it possible to identify the progress of digital transformation and its correlation with administrative efficiency in public universities in Peru. For the interpretation of the descriptive statistics, the findings were organized into 3 sections: level of progress of digital transformation, tabulation of variables and level of correlation.

1. Progress of the university's digital transformation

The descriptive results allow us to contextualize the progress of digital transformation in the universities analyzed, however, the central analysis of the study is aimed at identifying statistical relationships between the variables, according to the correlational scope of the research. The interpretation was made based on the results of the survey reported by the administrative collaborators, considering the degree of digital culture, use of digital platforms and administrative digitalization, each item was measured on a 5-point Likert scale (1 = very low, 5 = very high).

Table 2 Progress of digital transformation in public universities

Digital transformation	Operational Description	Number of universities	Percentage (%)
High	Administrative processes that are mostly digitized and integrated through institutional platforms	3	50 %
Intermediate	Coexistence of digital and manual processes, with partial digitization of procedures	3	50 %
Total		6	100%

Note. Prepared by the author according to an institutional survey (2025).

The results in Table 2 show that 50% of the universities analyzed have made high progress in digital transformation, characterized by extensive digitalization of administrative processes and the use of integrated institutional systems. Likewise, 50% are in an intermediate advance, which reflects the coexistence of digital and manual procedures.

The National University of San Marcos (UNMSM) and the National University of Engineering (UNI) lead the group with the greatest advances, due to their investment in integrated management systems (university ERP, online enrollment platforms and digitization of records). In contrast, younger universities such as the National University of Barranca (UNAB) and the National University of the

Altiplano (UNA-Puno) have limitations in infrastructure and regional connectivity, although they show efforts to incorporate virtual service systems for university citizens.

2. Tabulation of variables

As can be seen in Table 3, regarding the presence of

digital transformation in public universities in Peru, respondents indicate that they fully agree (68.1%) with the digital strategy that has been carried out in their institutions, as well as with the use of digital platforms (70.5%) and consider that they have the necessary digital skills (53.5%) to carry out their administrative operations efficiently.

Table 3 Presence of Digital Transformation in Peruvian Public Universities

Dimensions		1 Strongly disagree	2 Disagree	3 Indifferent	4 Okay	5 Totally agree	Total %
Digital Strategy	%	0	0	1,5	30,4	68,1	100,0
Digital platforms	%	0	0	13,1	16,4	70,5	100,0
Digital competence	%	0	0	0	46,5	53,5	100,0

Note. Prepared by the author according to an institutional survey (2025).

On the other hand, it is worth mentioning that SUNEDU, through its virtual program, shows that several public universities in the country have been strengthening their digital capacities. Among them, the Universidad Nacional Mayor de San Marcos stands out, which obtained official registration in Indecopi for Illariy, its virtual presenter based on artificial intelligence, which constitutes a significant advance in technological innovation.(2025)

According to table 4, regarding the administrative efficiency present in public universities in Peru, the respondents indicate that they totally agree (54.6%) with the optimization of resources that has been carried out in their institutions, in addition, they consider that there is a continuous improvement of processes (65.2%) and that there is a positive measurement of productivity (73.1%).

Table 4 Presence of Administrative Efficiency in Peruvian Public Universities

Dimensions		1 Strongly disagree	2 Disagree	3 Indifferent	4 Okay	5 Totally agree	Total %
Resource optimization	%	0	0	0	45,4	54,6	100,0
Process improvement	%	0	0	0	34,8	65,2	100,0
Productivity	%	0	0	0	26,9	73,1	100,0

Note. Prepared by the author according to an institutional survey (2025).

3. Correlation between digital transformation and administrative efficiency

Statistical processing using Spearman's Rho test yielded a coefficient of 0.764 (p = 0.001), as shown in

Table 5, which indicates a high and significant positive correlation between the variables digital transformation and administrative efficiency.

Table 5 Correlation test between variables

		Digital transformation	Administrative efficiency
Spearman's Rho	Digital Transformation	Correlation coefficient	1,000
		Sig. (bilateral)	,001
		N	80
	Administrative Efficiency	Correlation coefficient	,764**
		Sig. (bilateral)	,001
		N	80

Note. **. The correlation is significant at the 0.01 level (bilateral).

This means that universities with a higher degree of digitalisation also have better institutional management indicators: reduced response time, less bureaucratic burden and greater user satisfaction. On the other hand, Table 6 shows that there is a positive correlation between the dimensions of digital culture (r = 0.680), digital platforms (r = 0.775) and digital competence (r = 0.782) with

administrative efficiency.

Table 6 Correlation test between dimensions of digital transformation and administrative efficiency in public universities in Peru

	Dimensions of digital transformation		Dimensions of administrative efficiency
Rho de	Digital	Coefficient of	0,680**

Spearman	culture	correlation	
		Sig. (bilateral)	0,001
		N	230
	Digital platforms	Coefficient of correlation	0,775**
		Sig. (bilateral)	0,001
		N	230
	Digital competence	Coefficient of correlation	0,782**
		Sig. (bilateral)	0,001
		N	230

Note. **. The correlation is significant at the 0.01 level (bilateral).

4. Main findings

Universities with internal innovation policies or digital government areas have greater sustainability of technological projects.

Regional connectivity gaps and limited budget are the main obstacles to digitization in provincial institutions.

There is evidence of cultural resistance to technological change in personnel with more than 15 years of seniority.

Most universities still do not fully integrate their academic, administrative, and financial systems, which limits interoperability.

Overall, the results allow us to affirm that the digital transformation is progressing progressively but unevenly, conditioned by institutional, geographical and cultural factors that have a direct impact on university administrative efficiency.

4 DISCUSSION

The results show that the digital transformation (DT) in public universities in Peru is progressively advancing, although marked by institutional and regional inequalities. This finding coincides with what Dioses et al. (2021) point out, who argue that digital maturity in Latin American public management is limited by structural factors such as lack of technological investment, weak digital culture, and poor inter-institutional coordination. In the Peruvian case, these limitations are reflected in the disparity of resources between universities with a long history, such as the UNMSM or the UNI, and those recently created, such as the UNAB or the UNA Puno, which face lags in infrastructure and connectivity.

According to the National Digital Transformation Policy for 2030 (2023), the digitization of the State seeks to promote the efficiency, transparency, and accessibility of public services. However, its implementation in the university environment faces an additional challenge: the need to reconfigure traditional administrative models towards data-

based management, interoperability and digital leadership. In this sense, the present study confirms what Nita and Gutu (2023) identified: that the digitization of universities requires not only technological platforms, but also processes of cultural change and sustained institutional leadership.

Likewise, the correlation coefficient of 0.764 obtained in this research supports the hypothesis that digital transformation has a significant and positive relationship with administrative efficiency. This result is consistent with the findings of Tuni in the Regional Government of Puno and Hilario y León at the José Faustino Sánchez Carrión University, where it was demonstrated that the adoption of digital platforms allows optimizing management times and improving internal coordination. In this way, it is ratified that Digital Transformation should not be understood as a merely technological process, but as a comprehensive strategy of university public management.(2023)(2023)

Overall, the positive and statistically significant correlation identified between digital transformation and administrative efficiency suggests that a higher level of adoption of digital tools is associated with more favorable perceptions of staff administrative performance. This result is consistent with previous studies that argue that the digitalization of administrative processes is linked to improvements in the organization of work and in the internal management of public institutions, without necessarily implying a direct causal relationship.

On the other hand, the research reveals that universities that implement active innovation and digital training strategies have better levels of administrative efficiency. This agrees with Cueva (2020) who points out that one of the main challenges for university digital transformation is organizational inertia and the absence of training in information technologies, which makes it difficult for institutions to define a clear vision and effective leadership to digitize their processes. In addition, it warns that the lack of leadership, the lack of institutional strategy and cultural resistance represent important obstacles to consolidating a digital university.

International studies, by the OECD (2024) and the Inter-American Development Bank, through Pieterse (2023), argue that the digital transformation of higher education must be accompanied by knowledge management policies, sustained investment, and strengthening of digital skills. This perspective is partially reflected in the Peruvian context, where legislation on digital

government offers a favorable framework, but still insufficient in its practical application within public universities.

In contrast, the differences observed in the magnitude of correlations between the different dimensions of digital transformation and administrative efficiency suggest that not all components of the digitalization process are homogeneously related to administrative performance. This finding highlights the need to analyze digital transformation beyond an instrumental vision, considering organizational, procedural, and management aspects that influence the way technologies are incorporated into administrative practice.

In addition, the results confirm that the technological infrastructure focused on the use of digital platforms is not the only determinant of efficiency, since organizational digital culture and change management play a decisive role. In universities where institutional leadership promotes innovation and collaboration between areas, the indicators of administrative efficiency are notably higher. In contrast, those with rigid hierarchical structures tend to maintain extensive bureaucratic processes and low system interoperability.

In this way, it is shown that digital transformation is associated with administrative efficiency through the optimization of organizational processes. In particular, the digitization of procedures and the electronic management of documents are linked to greater efficiency in university administration, by facilitating the reduction of operational times and improving internal coordination.

Finally, it is important to note that the results should be interpreted with caution, given that the non-experimental design of the study does not allow establishing causal relationships or inferring direct effects between the variables analyzed. However, the associations identified provide relevant empirical evidence on the link between digital transformation and administrative efficiency, contributing to the understanding of the phenomenon in the field of Peruvian public universities and laying the foundations for future research with explanatory or longitudinal approaches.

5 CONCLUSIONS

The results of the statistical analysis allow us to conclude that there is a high positive relationship between digital transformation and administrative efficiency in public universities in Peru ($Rho = 0.764$; $p = 0.000$), between both variables, evidencing that both variables present an associated behavior within

the context of university institutional management.

The global correlational analysis shows that the level of digital transformation is positively associated with the administrative efficiency of the staff, which indicates that as the adoption of digital tools and processes increases, higher levels of perceived administrative efficiency also tend to be observed, without implying a causal relationship.

In this sense, it can be said that, while consolidated institutions such as the UNMSM and UNI show high levels of technological maturity; emerging universities, such as UNAB and UNA Puno, still face connectivity gaps, budget constraints, and delays in digital training. Therefore, this imbalance reflects the need for differentiated policies that address the particularities of each regional context.

At the level of dimensions, it is concluded that digital culture and the digital skills of administrative staff present a moderate correlation with administrative efficiency since it favors the digitization of administrative processes, which suggests that the automation of procedures and electronic document management are associated with better organization and fluidity in university administrative activities.

Likewise, the use of digital platforms shows a statistically significant relationship with administrative efficiency, which shows that the integration and effective use of digital platforms is associated with a more articulated administrative performance within the public universities analyzed. Finally, the results obtained promote future research and confirm the relevance of the correlational approach for the study of digital transformation in the public university environment, providing empirical evidence that contributes to the understanding of the relationship between technology and administrative management, and establishing a basis for future research with explanatory or longitudinal designs.

It is recommended that future research adopt explanatory or longitudinal designs that allow for a deeper understanding of the nature of the relationship between digital transformation and administrative efficiency, incorporating multivariate statistical techniques that contribute to a more comprehensive understanding of the phenomenon.

It is suggested to expand the sampling scope and institutional diversity in subsequent studies, including public and private universities, in order to contrast patterns of association and strengthen the analytical generalization of the results.

Conflict of interest

The author states that there is no conflict of interest

of a personal, academic or financial nature that could have influenced the results of the research.

Shakira Sheila Beltrán Urcuhuaranga (main author): Research, study design, article writing, analysis of results, conclusions and final recommendations (original draft, review and editing).

Authors' contribution

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