International Journal of Research in Human Resource Management

E-ISSN: 2663-3361
P-ISSN: 2663-3213
IJRHRM 2024; 6(1): 24-32
www.humanresourcejournal.com
Received: 16-11-2023
Accepted: 29-12-2023

Vassiliki A Exarchou
Department of Digital Systems, University of Thessaly, Greece

George M Aspridis
Department of Forestry, Wood Sciences and Design, University of Thessaly, Greece

Ilias K Savvas
Department of Digital Systems, University of Thessaly, Greece

Kleanthis Sirakoulis
Department of Business Administration, University of Thessaly, Greece

Georgia Garani
Department of Digital Systems, University of Thessaly, Greece

Corresponding Author:
Vassiliki A Exarchou
Department of Digital Systems, University of Thessaly, Greece

The impact of digital transformation on human resource management: A case study in higher education in Greece

Vassiliki A Exarchou, George M Aspridis, Ilias K Savvas, Kleanthis Sirakoulis and Georgia Garani

DOI: https://doi.org/10.33545/26633213.2024.v6.i1a.166

Abstract
As we experience the second era of machines (WEB 2.0, 4th industrial revolution), anticipating the creation of true machine intelligence and the interconnection of humans through a common digital network, this research examines the impact of digital technologies, communication networks, and software for the administrative, organizational, and educational functions within the context of a Greek higher educational institution, the University of Thessaly. It delves into the nature of problems, and identifies the limits of various approaches through analyses and designs.
The specific research objective is to establish communication between employees, supervisors, and directors of administrative services, introducing them to the new functioning methods of higher educational organizations. It aims to emphasize the importance of digitally representing organizations to meet emerging requirements, display tools for digitally transforming processes, and identify opportunities for sustainable development in the evolving digital landscape. Furthermore, the present study explores the feasibility of contemporary management responding effectively to globalization challenges and rapid technological changes, demonstrating high adaptability to the continuously evolving environment.

Keywords: Information systems management, digital transformation, organizational development, human resources management, higher education, innovation

1. Introduction
In the midst of a remarkable era of digital advancements, the overarching objective is to establish digital foundations that guide the design of appropriate organizational structures for managing human resources. This encompasses the cultivation of employees for specific roles, ensuring that individuals with the requisite skills are ready to deliver services. Furthermore, it involves specifying contract types governing the operation of various groups of workers. (Fenech, 2019) [1].
Employees, considered the most valuable assets of an organization, should be equipped with ample knowledge, including the use of digital recognition, artificial intelligence, and mobile applications. This ensures that they are deemed capable of tackling the challenges posed by the new digital era. (Makridimitris & Michalopoulos, 2000) [2].
Modern management possesses the ability to meet the challenges of globalization and rapid technological progress, adapting more extensively than ever to a highly dynamic environment (Makridimitris & Pravita 2012) [3].
The concept of digital transformation involves the various adaptations a business or organization makes to take advantage of the benefits offered by the internet, digital media, and emerging technologies. It is a continuous process that opens up opportunities but necessitates both education and infrastructure (Vial, 2021) [4]. To fully exploit the potential of digital transformation, businesses, organizations, and institutions need to acquire the essential knowledge and skills at all levels (Tabrizi *et al*., 2019) [5]. This is the key to creating a work environment adapted to the digital reality and the possibilities it offers (Gong & Ribiere, 2021) [6]. Digital transformation aims to strengthen the trinity of "people, data, and processes" with the goal of enhancing an organization's competitive profile. (Marler, 2009) [7].

2. Research methodology - Data collection tool

The methodology of this research was based on collecting primary data, followed by subsequent statistical processing and analysis. A questionnaire was selected as the tool to gather qualitative and quantitative data for addressing the research questions. Statistical methods were employed in data analysis to ensure more secure conclusions. The questionnaire was created using Google Forms and electronically distributed to participants from November 4, 2022, to January 25, 2023. This approach was deemed more suitable, cost-effective, and time-efficient. It is a method that allows information to be collected in a format that is easily used for statistical processing. Its main advantages include: a) significantly low cost, b) ease of completion and verification of responses, c) simple analysis of results, d) rapid access and coverage of a large geographical area, e) preservation of anonymity, and f) objectivity. (Lagoumintzis *et al*., 2015; Robson, 2010; Cooper *et al*., 2006) [8-10].

The initial stage involved a pilot study conducted in a focus group of 30 individuals that share the common characteristic of working at the University. The objective was to assess the questionnaire, improve it, and finalize its development.

2.1 The structured questionnaire used in this study included two types of questions

- Closed-ended questions, or questions with predefined answers.
- Graded questions with scaled responses.

The second section focused on the critical area of human resources management essential for achieving transformation. Specifically, it aimed to explore the necessary new skills for employees, the responsibilities undertaken remotely, and the impact of the pandemic on the percentage of telecommuting.

The third section investigated how organizational data is mined and analyzed. It included questions about whether measurable data exists at the University of Thessaly to support digital transformation, the types of data available, and the platforms/software used for this purpose.

The fourth section included questions aimed at gathering information regarding flexible organizational and management methodologies. This encompassed inquiries about the advantages of implementing these methodologies and the challenges encountered during their adoption, as perceived by the individuals in the research sample. Additionally, the assessment of the four fundamental concepts constituting the organizational capital of the University of Thessaly was explored. These concepts include culture, organization, technology, and information

Finally, the fifth section included questions aimed at outlining the profile of the participants, including demographic information such as gender, education level, position in the organization, years of experience at the University of Thessaly, as well as whether and when they have attended specialized seminars.

2.2 Statistical processing

Initially, frequencies and percentages of each response to each question were calculated using descriptive statistical measures. Subsequently, the existence of correlations between various aspects of the research and demographic characteristics was examined. For this investigation, either parametric tests (such as independent t-tests, one-way ANOVA) or non-parametric tests (such as Spearman correlation coefficients) were employed. The criterion for the presence or absence of correlation is the p-value, at a significance level of 5%. If the p-value > 0.05, there is no statistically significant difference, indicating no correlation. Conversely, if the p-value < 0.05, there is a statistically significant difference between different levels of categorical variables describing demographic characteristics. Statistical analysis was performed using the SPSS software package (version 22.0, IBM Corp., 2013).

3. Research hypotheses-questions

The first research component concerned the precondition of the adaptation of the educational organization under study to planned organizational changes, with the support and acceptance of the human factor expressing psychological or systematic reactions.

The second research component investigated whether administrative services have the necessary technological infrastructure, suitable structure, and connectivity to leverage ICT, and to what extent the staff of the administrative services have the required information technology skills. It also examined the current role and effectiveness of the administrative functions of academic units in a higher educational institution.

The purpose of the third research component was to explore whether these services have invested time in preparing for technological reform, digital transformation to enhance the transparency of administrative operations, ensuring that administrative reform has a holistic character in digital rejuvenation.

The fourth research component studied whether the responsible ministry has administrative capability or relies on the development of the regulatory framework (laws, presidential decrees, ministerial decisions, and others) related to sectoral public policy and expects some "automatic pilot" to implement them. Sometimes, in the need to implement sectoral public policy, the law provides for the creation of a new structure (legal entity or organizational unit or committee) rather than improving the administrative capacity of the existing one.

The goal of the last research component was to identify highly beneficial transformations from the application of digital technology in various functions that will significantly differentiate the current working reality, positively impacting the entire spectrum of these functions.

4. Research Results

The total sample of the study consisted of 226 employees from the University of Thessaly, with the majority being administrative staff (38.9%) and academic members (32.7%). Table 1 presents the demographic characteristics of the sample. Among them, the majority responded that they are very familiar with the term "digital transformation".

Table 1: Demographic characteristics of the sample.

Variable	Answer	Percentage
Gender	Males	56.54%
	Females	43.46%
Educational Level	Mandatory education	1.40%
	Secondary education	5.58%
	Tertiary education	20.47%
	Postgraduate	37.21%
	Ph.D.	34.88%
Position in the service	Administrative staff	38.86%
	Faculty Teaching and Research Staff	32.7%
	Supervisor	15.64%
	Teaching Assistant/Research Fellow	7.58%
	Director	0.95%
	General Manager/Executive Director	0.47%
	Other	3.79%
Level of computer literacy	Not at all	1.40%
	Very little	0.93%
	Little	11.21%
	Much	51.87%
	Very much	34.58%

However, a percentage of approximately 30% responded that they are somewhat familiar with the term "digital transformation." The participants were asked to answer about the actions they believe should be taken to achieve the digital transformation of the University of Thessaly. Nine actions were formulated, and they had to choose from four options. Subsequently, the average values were calculated. Actions with an average value greater than 2 mean that they are already in progress, with the adoption of new technologies having an average value of 2.41, employee training with an average value of 2.19, adoption of new methodologies for internal administrative processes with an average value of 2.15, and cultural change with an average value of 2.08. These actions, especially the first two, are the basic prerequisites for the digital transformation of any organization, including the University of Thessaly.

Actions with an average value close to 2 mean that they have already been set as a future goal, including encouragement of innovation from the external environment with an average value of 1.95 and data-driven decision-making with an average value of 1.94. This is followed by the development of top-down steps (decisions made by top executives) with an average value of 1.73, participation of external collaborators (e.g., outsourcing) with an average value of 1.62, and the development of bottom-up steps (decisions made on the basis of all human resources) with an average value of 1.58.

In the next question, respondents were asked about the ways in which the required new skills for the digital transformation of the University of Thessaly are acquired. They were given five ways with the option for multiple answers, as well as the option to state an additional method. The dominant method identified is staff training, with an overwhelming percentage of 92.1%. This was followed by collaborations with other universities/research institutions by 56.1%, and staff development by 44.9%. Recruitment of new staff was mentioned almost equally with a percentage of 30.8%, and collaboration with business consultants/consulting firms with a percentage of 19.0%. Therefore, the prevailing view is that the utilization of existing staff, followed by appropriate training and their collaborations with similar institutions, are the most significant ways, rather than hiring personnel from other fields or collaborating with external consultants. Finally, 1.9% reported other methods.

The participants were asked to answer who is responsible for the digital transformation of the University of Thessaly. They were given three options and the opportunity to nominate an additional responsible party. Approximately 40.3% of the participating employees consider that the Head of Information Systems is responsible for the digital transformation of the University of Thessaly, while 19.4% believe that the Vice-Rector of Academic Affairs and Student Welfare is responsible for the digital transformation. Only 3.5% believe that the Head of the Library and Information Center is responsible. It is noteworthy that 32.4% either do not know or did not respond to this question.

Subsequently, respondents were asked to indicate the extent to which the administration of the University of Thessaly is proactive. Their responses were captured using a five-point Likert scale, ranging from 1 denoting "not significant at all" to 5 representing "very significant." The mean value was set at 3, signifying "moderately significant." Following this, statistical measures such as mean, standard deviation, minimum, and maximum values were computed. The prevailing sentiment is that top-level management ensures effective collaboration among units, receiving a mean score of 3.72. Similarly impactful are views suggesting that at the initiation of the transformation, one or more individuals at the executive level were acquainted with digital technology, scoring an average of 3.67. Other notable perspectives include the belief that a collective sense of responsibility for achieving transformation objectives exists throughout the organization, garnering a mean score of 3.65, and that the management team crafts a coherent narrative of change shared with all organizational executives, obtaining a mean value of 3.64. Additionally, respondents expressed that senior management encourages staff to experiment with innovative ideas, reflecting an average score of 3.60. To a lesser extent, there is a perception that senior management conveys the urgency of changes, scoring an average of 3.45. Finally, senior management's encouragement of employees to challenge traditional work approaches received the lowest average score of 3.19. Notably, all mean values for these seven attitudes fall within the moderate significance range

of 3 to 4, showing no substantial discrepancies between them, prompting further investigation and discussion.

In the second section of the questionnaire, an investigation is conducted regarding the skills and abilities that the administrative staff of the University of Thessaly should possess, according to the survey participants. The participants were asked to identify the skills they consider necessary to support the digital transformation of University of Thessaly. The most critical skills highlighted are nearly equally the inclination towards innovation and change, the ability for active learning, and technological design, with percentages of 62.7%, 62.2%, and 61.8%, respectively. Closely followedare critical thinking and analysis at 51.6%, and creativity, originality, and initiative at 47.5%. Coordination and time management gather a percentage of 43.3%. Attention to detail and reliability follows with 31.8%, emotional intelligence with 22.1%, and finally, leadership and social influence with 18.4%. Additionally, 0.55% mentioned other skills, and 1.4% stated that they are not informed on the matter.

Subsequently, those who participated in the survey were asked to express the extent to which the University of Thessaly implemented telecommuting and what responsibilities they undertook remotely before the COVID-19 pandemic. Regarding the period before the Covid-19 pandemic, according to the participants' opinions, employees collaborate effectively in various administrative functions at a rate of 57.5%, and the organization periodically contributes to the retraining of its employees at a rate of 21.5%. In contrast, they believe that employees have a high degree of autonomy in organizational decision-making at only a rate of 7.5%, while employees are rewarded for generating new ideas, following practices of testing and learning, and taking appropriately leveled risks at an even lower rate of 4.0%.

Also, those who participated in the survey were asked to express the extent to which the University of Thessaly applied telecommuting and which responsibilities were undertaken remotely after the COVID-19 pandemic. Regarding the period after the Covid-19 pandemic, according to the participants' opinions, employees continue to collaborate effectively in various administrative functions at a rate of 48.8%, while the organization periodically contributes to the retraining of its employees at a rate of 13.3%. They believe that employees have a high degree of autonomy in organizational decision-making at only a rate of 12.3%, while employees continue to be rewarded for generating new ideas, following practices of testing and learning, and taking appropriately leveled risks at an even lower rate of 4.3%.

Comparing the period before and after the COVID-19 pandemic, in the participants' opinion, employees collaborate effectively in various administrative functions at rates of 57.5% and 48.8%, respectively. Therefore, to some extent, the effective collaboration of employees has decreased after the pandemic. Presumably, the increased autonomy provided after the pandemic is responsible for the reduction in effective collaboration, likely due to insufficient coordination. Additionally, employee retraining has decreased, as the organization periodically contributes to the retraining of its employees at a rate of 21.0% pre-pandemic and only 13.3% post- pandemic. On the contrary, the level of employee autonomy has increased, as employees have a high degree of autonomy in organizational decision-making at a rate of 12.3% post-pandemic, compared to 7.5% before it. Finally, employees continue to be rewarded low for generating new ideas, following practices of testing and learning, and taking appropriately leveled risks at a rate of 4.3% post- pandemic, compared to 4.0% before it.

In the third section of the questionnaire, an investigation is conducted regarding the extraction and analysis of organizational data and processes at the University of Thessaly. Specifically, participants in the survey were asked for their opinion on whether the digital transformation at University of Thessaly is based on measurable data. Of the 226 participants, 200 provided valid responses. Among the valid responses, 8.0% believe that the digital transformation at the University of Thessaly is not based on measurable data at all, 10.5% believe that it is based very little, and 34.0% believe that it is somewhat based on measurable data. In total, 52.5% of employees believe that the digital transformation at the University of Thessaly is not sufficiently based on measurable data. On the contrary, the remaining respondents (47.5%) believe the opposite, with 41.0% thinking it relies a lot, while 6.5% believe it relies extremely on measurable data.

Participants were also asked to respond to the question of what kind of data the University of Thessaly maintains, among five options. A percentage of 10.2% of the participants answered that they do not know what kind of data the University of Thessaly maintains. From the responses of the rest, the most significant categories of data highlighted are employee data with a percentage of 78.1% and financial data with a percentage of 72.6%. This is followed by data on material suppliers with a percentage of 54.0% and data on internal organizational processes with a percentage of 51.2%. Service product data gathered a percentage of 31.2%. Finally, 2.3% indicated another category of data.

The fourth section of the questionnaire concerns flexible project organization and management methodologies and process modernization. Participants were asked to indicate the advantages they believe arise from implementing flexible management methods, among six options. The most significant advantages reported include improved service quality and enhanced team communication and coordination, with percentages of 70.5% and 65.9%, respectively. Following these, flexible planning for faster response to change is mentioned by 61.3%, and improved productivity is highlighted by 56.2%. Lastly, better team morale scores 35.0%, while setting more accurate priorities is indicated by 31.8%. Finally, 0.5% mentioned one more advantage.

Participants were asked to identify the difficulties they encounter when implementing flexible management methods, among seven options. The dominant challenges identified include inadequate knowledge of the method's implementation by the administrative executives of the University of Thessaly with a percentage of 36.4%, as well as insufficient knowledge of function management with a percentage of 33.2%. Nearly equal proportions follow, indicating that administrative executives of the University of Thessaly resist changing their working methods and that project documentation is overly bureaucratic, with percentages of 28.3% and 27.3%, respectively. The fact that administrative executives of the University of Thessaly do not follow the method is reported by a percentage of 24.6%.

Finally, resource allocation is considered a challenge as it delays project completion with a percentage of 16.0%, while only 8% believe that flexible methods are not suitable for the University of Thessaly. Additionally, 2.7% reported other difficulties. It is noteworthy that the lack of knowledge and, more generally, the attitudes of the administrative staff of the University of Thessaly are considered challenges.

Survey participants were then asked for their views on organizational culture. Participants expressed their views on seven dimensions of culture using a Likert scale, where 1 corresponds to "not at all" and 5 to "very much." Descriptive statistics (mean, standard deviation, minimum, and maximum values) were then calculated. The higher the mean value of a dimension, the more significant it is considered by the participants. Thus, the belief that the competitive strategy of the University of Thessaly with a mean value of 3.72 is considered by the participants to express the organization's culture to a greater extent, as well as that top executives support the digital strategy with a mean value of 3.55. Almost equally, the University of Thessaly has the right leaders executing the digital strategy on a daily basis with a mean value of 3.16, and that it invests in targeted digital education and training at all levels of the organization with a mean value of 3.10. Finally, almost equally, it is considered that the University of Thessaly clearly communicates its digital vision both internally and externally with a mean of 2.98, and that it prioritizes the overall employee experience over the performance of any individual channel with a mean of 2.95, and that takes measurable risks to enable innovation with a mean of 2.92.

Survey participants were asked for their opinions on the organization of the organization. The participants expressed their views on seven proposals-dimensions of the organization. Thus, it emerges that the prevailing sentiment is that personnel supporting critical digital functions are the best in the category, with a mean value of 3.33, and that the structure of the University prioritizes the citizen/customer journey with a mean of 3.23. Following almost equally, the organizational model of the University encourages interoperability with a mean of 3.13, and that partners-suppliers provide value that enhances the digital capabilities of the University with a mean of 3.10. Finally, the University dedicates adequate resources to digital strategy, governance, and execution with a mean value of 3.07, and has established recurring processes for managing digital programs with a mean value of 3.04. Remarkably, however, all mean values of the seven dimensions of the University's organization are slightly above 3, indicating moderate significance, with no significant differences among them worth exploring and discussing.

Survey respondents were tasked with providing feedback on the organization's technology. Findings indicate greater use of modern architectures (such as cloud services) at the University to enhance speed and flexibility, with an average score of 3.26. Moreover, digital tools are applied to foster innovation, collaboration, and employee mobility, achieving an average score of 3.22. The perception that the budg*et al*located to technology development is adaptable, allowing for prioritization changes, received an average score of 3.19. Nearly equally, there are opinions that knowledge management is employed to redirect the technological design of the University, receiving an average score of 3.06. Additionally, technological teams are rated based on business outcomes rather than mere system functionality, scoring an average of 3.03. The approach to technology development is also seen as flexible, iterative, and collaborative, with an average score of 3.00. In this context, marketing and technology resources collaborate to co-create the digital roadmap, yielding an average score of 2.98. It is noteworthy that all mean values for the seven dimensions of University technology are close to 3, indicating moderate significance, without substantial differences between them that merit further exploration and discussion.

Survey participants were asked to provide feedback on the information-related aspects of the organization. Their opinions on six proposed dimensions concerning information reveal that the predominant belief is that the knowledge of the participants actively guides the digital strategy of the University, with an average score of 3.14. Equivalently, there are estimations that input from participants shapes and informs digital design and development, scoring an average of 3.09, and that at the University, they fuel their strategy with lessons and information acquired from previous actions, with an average score of 3.02.

On the contrary, there is a lag in the existence of digital goals, as well as measures of effectiveness and efficiency in these areas, given that the three dimensions related to these aspects have average scores below 3. Specifically, the presence of clear and measurable goals for measuring the success of the University's digital strategy has an average score of 2.88. The estimation that every employee understands that their performance is linked to the digital goals of the University has an average score of 2.80, while the assessment that citizen/customer-centric metrics are used to measure success has the lowest average score of 2.72.

For each fundamental concept, namely "culture," "organization," "technology," and "information" of the University of Thessaly, a composite variable was calculated as the average of its individual dimensions. A reliability analysis was conducted collectively for these four domains of the questionnaire, using Cronbach's alpha coefficient as the criterion. The data is normally distributed. The result indicates that $\alpha=0.967>0.7$, signifying a very high research reliability of the questionnaire used concerning the aspect of the four fundamental concepts characterizing the University of Thessaly. Subsequently, descriptive statistics (mean, standard deviation, minimum, and maximum values) were computed (Table 2).

Table 2: Descriptive data of fundamental concepts.

	Minimum	Maximum	Mean	Std. Deviation
Culture	1,00	5,00	3,2034	,77411
Organization	1,00	5,00	3,1740	,75120
Technology	1,00	5,00	3,1230	,79021
Information	1,00	5,00	2,9501	,89542

It is evident that the four fundamental concepts are assessed almost equally, with an average value close to 3, which is the mean of the five-point Likert scale, indicating that their evaluation is at moderate levels. The four key concepts are strongly positively correlated with each other, as shown in the table below with Spearman’s rho correlation coefficients, given that the p-value=sig=0.000<0.05.

Table 3: Shows Correlations between Culture, Organization, Technology and Information

Correlations						
			Culture	**Organization**	**Technology**	**Information**
Spearman's rho	Culture	Correlation Coefficient	1,000	,786**	,770**	,696**
		Sig. (2-tailed)	.	,000	,000	,000
		N	196	188	184	186
	Organization	Correlation Coefficient	,786**	1,000	,772**	,774**
		Sig. (2-tailed)	,000	.	,000	,000
		N	188	197	186	189
	Technology	Correlation Coefficient	,770**	,772**	1,000	,810**
		Sig. (2-tailed)	,000	,000	.	,000
		N	184	186	194	187
	Information	Correlation Coefficient	,696**	,774**	,810**	1,000
		Sig. (2-tailed)	,000	,000	,000	.
		N	186	189	187	197

Subsequently, the existence of correlations between various aspects related to the digital transformation of the University of Thessaly and the demographic characteristics of the survey participants was investigated. In terms of gender, there is a statistically significant difference in responses between men and women concerning their familiarity with the term 'digital transformation,' with men being more familiar to a greater extent. In their responses regarding the involvement of external collaborators, men more often consider their use as a future goal. In terms of creativity, innovation, and initiative as necessary skills for the digital transformation of University of Thessaly, women consider them more important compared to men. The same pattern is observed for skills such as coordination and time management, technological design and programming, better team ethics, and the adoption and implementation of flexible management methods at the University of Thessaly. Women tend to rate these aspects more positively than men. As for the difficulties in adopting and implementing flexible management methods at the University of Thessaly, men evaluate them more negatively than women. Additionally, the perception that the administrative executives of the University of Thessaly refuse to change their way of working is evaluated more negatively by men. Finally, concerning the utilization of modern architectures (cloud, etc.) to promote speed and flexibility, men evaluate it more negatively to a greater extent.

There is also a statistically significant difference among participants with different educational levels in terms of their familiarity with the term 'digital transformation,' with Masters and PhD holders appearing more familiar with the term. Regarding whether the digital transformation at the University of Thessaly is based on measurable data, employees with mandatory training responded to a lesser extent than others that this is the case. A possible explanation is that they may not have responsibilities related to such methods, and therefore, are unaware. In the case of using a platform/software for mining and recording internal functions to optimize processes at the University of Thessaly, secondary education employees responded more positively at a higher rate. A possible explanation is that administrative staff, who mainly use these tools, are largely secondary school graduates, with the ability for active learning being predominantly affirmed by the participants, especially those with master's and doctoral degrees. Concerning technological design and programming, a majority of participants responded positively, especially those with a master's degree. Regarding the adoption of telecommuting at the University of Thessaly after the COVID-19 pandemic and the delegation of responsibilities remotely, most participants, especially those with master's and doctoral degrees, reported that employees collaborate effectively in various administrative functions.

Furthermore, there is a statistically significant difference between participants with different positions in the organization regarding their familiarity with the term 'digital transformation,' with academic staff (Teaching and Research Staff members) showing higher familiarity rates. The financial challenges (low funding) of the organization impose a digital transformation, where the majority of administrative staff responded negatively. In terms of hiring personnel for digital transformation, the majority of administrative staff responded negatively. Regarding the person responsible for digital transformation (question 5), the majority of administrative staff responded that they do not know. In terms of the inclination towards innovation and change, academic staff members responded more positively. However, concerning attention to detail and reliability, the majority of administrative staff responded negatively.

The Spearman's rho correlation coefficient again with the criterion of p-value < 0.05, some correlations at 5% level of significance emerge. Years of experience at the University of Thessaly are negatively correlated with hiring new personnel as a means of acquiring the required new skills for digital transformation. There is also a negative correlation with the inclination towards innovation and change as a necessary skill for the digital transformation of the University of Thessaly. Additionally, there is a negative correlation with creativity, originality, and initiative as necessary skills for the digital transformation of the University of Thessaly. Moreover, the percentage of telecommuting implementation and the responsibilities undertaken remotely before the COVID-19 pandemic, as well as the use of data mining and recording software/platforms for optimizing processes at the University of Thessaly, show significant correlations.

The total years of work experience are negatively correlated with Collaborations with other universities/research institutions as a means of acquiring the required new skills for the digital transformation of the University of Thessaly. Additionally, they are negatively correlated with Critical thinking and analysis as a necessary skill for the digital transformation of the University of Thessaly, Creativity, originality, initiative as necessary skills for the digital transformation of the University of Thessaly, Improvement of service quality as an advantage from the adoption and implementation of flexible management methods at the University of Thessaly, and Utilization of modern

architectures (cloud, etc.) to promote speed and flexibility.
On the other hand, these years of experience are positively correlated with Participation of external collaborators (e.g., outsourcing) and Hiring new personnel as a means of acquiring the required new skills for digital transformation. The above can be explained by the fact that these employees, having work experience outside the University of Thessaly, possibly in the private sector, may have this perspective.
Examination of assumptions regarding the existence of correlations between key parameters related to digital transformation was based on the use of the Spearman's rho correlation coefficient with a p-value criterion. The need to understand and incorporate new technologies, identified as the dominant reason driving digital transformation, is positively correlated with inclination towards innovation and change (r=0.272, p=0.002), technological design (r=0.175, p=0.010), critical thinking and analysis (r=0.210, p=0.002), as well as creativity, originality, and initiative (r=0.202, p=0.003), as essential skills supporting the digital transformation journey. In relation to the cultural and organizational dimensions of the University of Thessaly, it is weakly positively correlated with customer/citizen focus.
The imperative to alter our work methodologies, identified as the secondary principal impetus steering digital transformation, is positive correlated with proclivities toward innovation and adaptability (r=0.172, p=0.012), strategic technological design (r=0.175, p=0.010), critical cognitive processes and analytical acumen (r=0.210, p=0.002), and the enhancement of creativity, originality, and proactive inclinations (r=0.202, p=0.003). These competencies are deemed essential for underpinning the digital transformation trajectory. Concerning the cultural and organizational dimensions of the University of Thessaly, a marginal negative association is discernible with respect to the clarity of communication pertaining to digital vision (r=-0.155, p=0.015). This intimates that individuals perceiving a lack of clarity in the articulation of the University's digital vision, internally and externally, emphasize more profoundly the imperative for a transformative shift in work methodologies.
The pursuit of new development opportunities, identified as a reason for digital transformation, is predominantly associated with the cultural and organizational dimensions of the University of Thessaly. Specifically, it shows negative correlations with targeted investment in digital education and training at all levels of the organization (r=-0.171, p=0.014), the clear communication of the digital vision both internally and externally (r=-0.174, p=0.012), and the willingness to undertake measurable risks to facilitate innovation (r=-0.155, p=0.022).
The restoration of a leadership position in the academic landscape, identified as a reason for digital transformation, is positively correlated with the cultural and organizational dimensions of the University of Thessaly. Specifically, it is positively associated with the belief that top executives support the digital strategy (r=0.210, p=0.002), the perception that the University of Thessaly has the right leaders to execute its digital strategy (r=0.210, p=0.002), targeted investment in digital education and training at all levels of the organization (r=0.237, p=0.011), clear communication of the digital vision both internally and externally (r=0.189, p=0.006), and the willingness to take measurable risks to enable innovation (r=0.168, p=0.017). This positive correlation extends to organizational dimensions. In other words, those who positively evaluate the cultural and organizational dimensions at the University of Thessaly consider the attainment of a leadership position in the academic field as a significant reason for digital transformation, as they believe that there are already strong points in terms of culture and organization. Conversely, those who perceive the organization as lagging behind peer institutions assess cultural dimensions negatively. Specifically, this reason is negatively correlated with the perceptions that top executives support the digital strategy (r=-0.309, p=0.000) and that the University of Thessaly has the right leaders to execute its digital strategy (r=-0.191, p=0.006), as well as with targeted investment in digital education and training at all levels of the organization (r=-0.173, p=0.013) and the clear communication of the digital vision both internally and externally (r=-0.177, p=0.006). In other words, those who believe that the University of Thessaly lags behind peer institutions, negatively evaluate the above dimensions which are mainly related to the quality of administration. This is reflected in the fact that this particular reason is positively correlated with leadership and social influence, which are considered necessary skills to support digital transformation (r=0.222, p=0.001) (Figure 1).

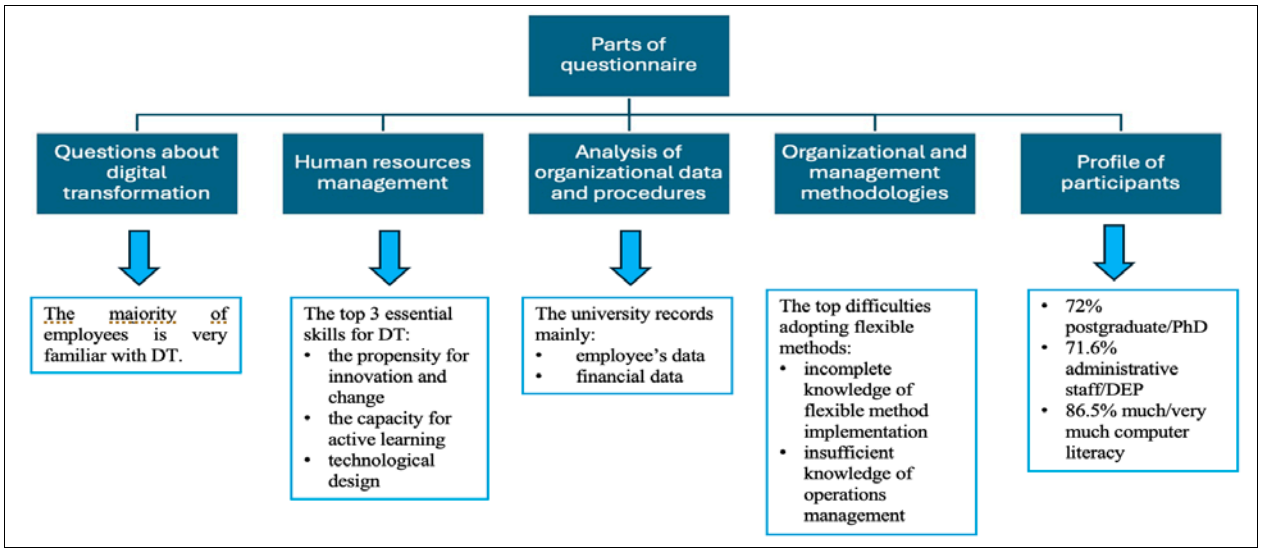

Fig 1: The parts of the questionnaire depicting a part of the results.

5. Discussion

In this study, an attempt was made to explore the impact of digital transformation on human resource management within the framework of a tertiary educational institution. It is noteworthy that this is the first study addressing the issue in Greek tertiary education. The present research revealed that employees with experience in sectors outside the tertiary educational institution, possibly in the private sector, consider it beneficial to implement and adopt flexible management methods in the educational institution, as well as the necessary skills for digital transformation. These skills include creativity, innovation, and initiative.

Comparing the period before and after the Covid-19 pandemic, employees collaborated effectively in various administrative functions to a lesser extent after the pandemic, likely due to inadequate coordination and a higher degree of autonomy in organizational decision-making (Kim, 2021; Bogdandy *et al*., 2020) [11, 12]. The implementation of flexible management methods in the organization encounters marginal obstacles from organizational executives who refuse to change the way of working within the organization.

Digital transformation is an innovation expected to be integrated into tertiary education institutions (Bilyalova *et al*., 2020) [13]. Essentially, innovation represents the successful and efficient use of new ideas, with many research supporters attempting to analyze how, in combination with technological change, it contributes to the advancement of processes and the introduction of new administrative, educational functions, as well as organizational structures (Nicolás-Agustín *et al*., 2022) [14]. Moreover, it is predicted to influence the management of educational institutions, with a research approach seeking to examine the precise motivations and mechanisms guiding this transformation (Hashim *et al*., 2021) [15]. Digital transformation has implications for human resource management, manifesting a preference for hiring new talented individuals with expertise in digital technology. This impact lays the groundwork for generating a plethora of information that surpasses the past (Vardarlier, 2020) [16].

Despite the benefits, technology also entails risks due to users' inexperience with constantly evolving electronic information systems. Detecting risks becomes indistinct and more challenging. Nevertheless, the widespread use of electronic information systems in both the public and private sectors brings positive benefits for citizens and their employees (Hang, 2021) [17].

The adoption of digital technology in educational institutions is expected to liberate the human resources from outdated practices and lead to administrative reform with a high degree of efficiency. This reform, driven by digital transformation, allows for a comprehensive and differentiated approach to administration, freeing human resources from outdated behaviors (Balyer & Öz, 2018) [18].

The implementation of digital transformation is expected to offer a more positive utilization of employee experience, while transformative learning will enable a change in the overall perspective and evolution of administrative practices (Benavides *et al*., 2020) [19]. In a country like Greece, where an aging society requires adaptation to technological advancements, digital transformation emerges as a necessary factor for ensuring well-being and satisfaction in the workplace.

The main limitation of the proposed research is that it was conducted in a single University of the country, although it pertains to the entire human resources. Further verification of the responses may be required. The research could potentially be generalized to all Higher Education Institutions of the country, especially during the period that followed major organizational changes, such as the integration of Technological Educational Institutes (TEIs) into Universities.

In previous studies (Kerroum *et al*., 2020; Orlikowski & Iacono, 2001; Kim, Wang & Boon, 2020) [20-22], researchers have argued that digitization of higher education is a strategic goal for many universities, shifting education from the traditional instructor-led model to a student-led model. This suggests a continuous adaptation to new technological environments, while researchers, for their part, will continue to strive to understand the involvement of new technologies in human resource management. Finally, three perspectives on technology (as a tool, a mediator server (proxy), and a set of technologies) were also identified.

6. Conclusion

The results of the research and their dissemination across all Higher Education Institutions of Greek Tertiary Education are expected to contribute to significant organizational changes, especially given that Higher Education Institutions, as dynamic environments, exhibit considerable functional differentiation due to the existence of many and diverse groups. Therefore, the greatest possible cohesion is required, achievable through the use of new technologies and innovation, which will help address complex problems, particularly due to direct interaction with the external environment. The topic is also of sociological interest due to changes in work and human relationships stemming from the economic and social crises of recent years. The study aspires to contribute to the broader debate on the Europeanization and technological development of national public administrations in the European Union's effort for administrative integration. We must contribute to the effort undertaken by several academics to create modern conceptual tools, allowing public administration to gain the dynamics of the 21st century by embracing contemporary developments in both theory and new management practices.

Unfortunately, Greece remains behind in e-governance issues, mainly due to the lack of continuity in the Public Administration, the absence of a long-term vision for the state's digital transformation, and significant delays or deficiencies in the planning crucial projects.

7. References

1. Fenech R, Baguant P, Ivanov D. The changing role of human resource management in an era of digital transformation. Journal of Management Information & Decision Sciences; c2019, 22(2).
2. Makridimitris A, Michalopoulos N. Expert Reports on Public Administration 1950-1998. Athens: Papazisis (in Greek); c2000.
3. Makridimitris A, Pravita M. Public Administration - Elements of Administrative Organisation. Athens – Thessaloniki (in Greek); c2012.
4. Vial G. Understanding digital transformation: A review and a research agenda. Managing Digital Transformation; c2021. p. 13-66.
5. Tabrizi B, Lam E, Girard K, Irvin V. Digital

transformation is not about technology. Harvard Business Review. 2019 Mar;13:1-6.
6. Gong C, Ribiere V. Developing a unified definition of digital transformation. Technovation. 2021;102:102217.
7. Marler JH. Making human resources strategic by going to the Net: reality or myth? The International Journal of Human Resource Management. 2009;20(3):515-527.
8. Lagoumintzis G, Vlaxopoulos G, Koutsogiannis K. Research Methodology in Health Sciences. [e-book] Athens: Association of Greek Academic Libraries. Available at: http://hdl.handle.net/11419/5356 (access on 09.12.2023); c2015.
9. Robson C. Real-World Research-A Tool for Social Scientists and Professional Researchers (Translated by Dalakou V, Vasilikou K.). Gutenberg (1993 Edition), Athens; c2010.
10. Cooper H, Robinson JC, Patall EA. Does homework improve academic achievement? A synthesis of research, 1987-2003 [Electronic version]. Review of Educational Research. 2006;76:1-62.
11. Kim HJ. Digital transformation of education brought by Covid-19 pandemic. Journal of the Korea Society of Computer and Information. 2021;26(6):183-193.
12. Bogdandy B, Tamas J, Toth Z. Digital transformation in education during COVID-19: A case study. In: 2020 11th IEEE International Conference on Cognitive Infocommunications (CoginfoCom); c2020. p. 173-178.
13. Bilyalova AA, Salimova DA, Zelenina TI. Digital transformation in education. In: Integrated Science in Digital Age: ICIS 2019. Springer International Publishing; c2020. p. 265-276.
14. Nicolás-Agustín Á, Jiménez-Jiménez D, Maeso-Fernandez F. The role of human resource practices in the implementation of digital transformation. International Journal of Manpower. 2022;43(2):395-410.
15. Hashim MA, Tlemsani I, Matthews R. Higher education strategy in digital transformation. Education and Information Technologies; c2021. p. 1-25.
16. Vardalier P. Digital transformation of human resource management: Digital applications and strategic tools in HRM. In: Digital Business Strategies in Blockchain Ecosystems: Transformational Design and Future of Global Business; c2020. p. 239-264.
17. Hang NT. Digital education to improve the quality of human resources implementing digital transformation in the context of industrial revolution 4.0. Revista Geintec-Gestao Inovacao E Tecnologias. 2021;11(3):311-323.
18. Balyer A, Öz Ö. Academicians' Views on Digital Transformation in Education. International Online Journal of Education and Teaching. 2018;5(4):809-830.
19. Benavides LMC, Tamayo Arias JA, Arango Serna MD, Branch Bedoya JW, Burgos D. Digital transformation in higher education institutions: A systematic literature review. Sensors. 2020;20(11):3291.
20. Kerroum K, Khiat A, Bahnasse A, Aoula ES. The proposal of an agile model for the digital transformation of the University Hassan II of Casablanca 4.0. Procedia Computer Science. 2020;175:403-410.
21. Orlikowski WJ, Iacono CS. Research commentary: Desperately seeking the "IT" in IT research-A call to theorizing the IT artifact. Information Systems Research. 2001;12(2):121-134.
22. Kim S, Wang Y, Boon C. Sixty years of research on technology and human resource management: Looking back and looking forward. Human Resource Management. 2021;60:229–247.