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The Impact of Digital Modernity on Administrative Performance in Saudi Universities

Sami Hadwan Rashid Al-Anzi[1], **Maher Toukabri**[2*]

[1]Northern Border University, Arar, Saudi Arabia.
[2]College of Business Administration, Northern Border University, Arar, Saudi Arabia; maher.toukab@nbu.edu.sa (M.T.).

Abstract. The study aimed to assess the impact of digital modernity on administrative performance at Northern Border University, Saudi Arabia. The research involved 788 employees and a sample of 395 individuals. The study used a descriptive approach and SPSS program to analyze data. Results showed that the university's contribution to employee awareness of digital systems in administrative work was significant, with a mean of 4.41. However, there was a discrepancy around the axis of digital modernity. The study also found that digital transformation contributed to the development of administrative performance, with a mean of 4.07, indicating agreement. The advantages and constraints of digital modernity on administrative performance were also agreed upon. The study recommends meeting the needs of digital transformation and supporting the process to keep pace with global development.

Keywords: Administrative Performance, Digital Modernity, Digital Transformation, Saudi Universities.

1. INTRODUCTION

The development in communications and the information systems is changing the knowledge society drastically. This has brought a change in administrative activities from traditional to electronic ways of operation, whereby the administrative services are increasingly improved in Saudi universities (Stolterman and Croon Fors, 2004). Digital modernity changed the way of administration to effective, smooth operations and service delivery. The modernization has digitized the traditional administrative tasks, hence reducing the time and pressure of administration. Digital modernity has also ensured that communication and collaboration between departments and stakeholders is well improved through video conferencing, online collaboration, and sharing of information (Fraillon, Schulz, and Ainley, 2013).

The Internet enhanced the power of digital modernity within organizations in pursuit of peak performance, time and work integrations, and cost cuts (Nwankpa and Roumani, 2016). However, digital transformation encompasses an overall change in the way of carrying out work and communication among work associates (Khammash, 2013). For this reason, an extraordinary framework and process toward management change are adopted with the support and financial wherewithal from the top administrative leadership.

In fact, most of the research on digital modernity has focused on the challenges and obstacles facing its application without indicating how to enable it, and take advantage of the positives coming from its application to administrative performance in Saudi universities (Kaya and Patton, 2011).

2. THEORETICAL FRAMEWORKS

Digital transformation is a concept that emerged from the rapid advancement of computers and information technology, enabling young people to access, design, and transmit information (Fraillon, Schulz, and Ainley, 2013). It has become a general concept in various sectors, including health, industry, trade, and education. The concept is based on the integration of digital technologies, processes, and skills across all levels and functions. Through this digital transformation, different revolutions have played a role including the First, Second, Third, and Fourth Industrial Revolution. (Stolterman and Croon Fors, 2004).

The benefits of digital transformation include improved communication, information exchange, increased capability and innovation, and increased opportunities for worker (Ricciardi, Pita Barros, Bourek, Brouwer, Kelsey, and Lehtonen, 2019). Governments benefit from unlimited access to information, ensuring workers have more opportunities and fulfill their desires. First Industrial Revolution, Second Industrial Revolution, Third Industrial Revolution, and Fourth Industrial Revolution-all of these drive various ways the growth in digital transformation. The benefits of digital transformation include improved communication, information exchange, and increased productivity (Tang and McDonald, 2019).

Digital transformation incorporates technologies, data, human resources, and operations. Technologies involve devices, operating systems, storage media, and software, while data involves managing and analyzing it to come up with reliable information (Navimipour and Soltani, 2016). Human resources are highly needed in digital transformation; most practices need qualified personnel who analyze and use data to make decisions. Operations refer to interdependent functions that create specific services or products (Ricciardi, Pita Barros, Bourek, Brouwer, Kelsey, and Lehtonen, 2019). In other words, all digital transformation needs to set a vision for the institutions and be under continuous review, in addition to finding the leadership and administrative support to continue receiving it. That is, finding all human and financial resources and the required materials and

* Correspondence: maher.toukab@nbu.edu.sa

legislation (Ayaz and Yanartaş, 2016).

Blockchain is a high-tech invention by Satoshi Nakamoto in the year 2008, which has greatly affected the different fields within business (Boutaleb and Toukabri, 2024). On the other hand, cloud computing was invented by Ramnit Shilpa in the year 1997. It refers to technologies whose dependency shifts from computers to servers in terms of processing and storage space (Toukabri and Boutaleb, 2024). This therefore gives way to many data being stored without necessarily the use of big programs.

There are several kinds of digital transformation models that exist and help in transforming organizations from traditional to digital (Ibrahim, 2010). The Technical Model focuses on operations research, computer science, and management science. Since the Technical Model does not consider the behavioral aspects, the result will be a resistance to electronic applications. The Behavioral Model focuses on a shift in behavior while minimizing the importance of optimization and models within a decision (Ahmed, 2001). The Socio-Technical Model takes into consideration the interaction between technical and behavioral fluctuations (Markham, 2007).

The Information Partnership Model subscribes to the core of digital transformation, either local or international information networks (Toukabri and Boutaleb, 2024). The Competitive Forces Analysis Model provides a design to the information systems in such a way that maximizes the organizational strengths and reduces the weaknesses (Navimipour and Soltani, 2016). The Digital Asset Management Model depends on various companies for managing digital files (Radwan, 2004). The Gradual Transformation Model focuses on financial capabilities and a strategic transformation model taking information and communications as capital assets (Al-Salmi, 2008).

E-management is a new scientific term that has entered most of the new sciences (Khammash, , 2013). It reflects all the uses of information and communication technology, such as computers, networks, fax machines, and devices for wireless entry of data, to handle daily administrative matters (Saad, 2008). Its main objective is to reduce the use of paper, simplify procedures, eliminate routines, and enhance performance and efficiency by using web-based technologies in human resources systems. It also features electronic archives, directories, diaries, and voice messages for paperless management (Al-Sirafi, 2007). Em-management is done without a place using mobile phones, international telephones, electronic conferences, and working remotely on the internet. There is also no time since the e-management works on a continuous basis 24 hours a day (Fraillon, Schulz, and Ainley, 2013). In fact, moving to e-management is an inevitable fait accompli due to changes in the global context (Radwan, 2004). The importance of integration, participation, and the use of information became one of the elements of success for institutions. Institutional competitiveness, therefore, relies on the time factor contributed to by technological progress of knowledge (Ghoneim, 2004). The technological revolution avails opportunities for individuals, governments, and businesses to improve the quantity and quality of human life (Kurana, & Alim, 2006)

It has created openness trends, interconnection, and integration between human societies due to globalization (Matar, 2015). Connections have been set up through digital tools across different spheres of information and services, using, for example, the Internet and satellite communications (Najm, 2001). Simultaneously, global liberation movements make fierce demands for openness, freedom, participation, and respect for human rights, taking advantage of changes that are radical in societal structures and political systems. Complex procedures, immediate decisions, unification of data, rates concerning performance measurement, circulating data, technological development, rising competition, and continuous communication between the entities of employees drive the electronic transformation (Ayaz and Yanartaş, 2016). Such changes have affected public sector visions and increased awareness.

Electronic management can manifest in a variety of forms, including e-government, e-commerce, e-health, e-learning, and electronic publishing. E-government is responsible for conducting public affairs in an effort to achieve social, economic, and political aims via electronic media. E-commerce involves an exchange of information and services through the use of the Internet (Najm, 2009). The services provided by e-health include: consultations, services, and medical information for patients. E-learning makes academic lectures, written tests, and discussions of scientific theses available. Electronic publishing opens access to up-to-the-minute news, economic and social bulletins, search engines, and so on (Yaseen, 2006).

All in all, there is an effective traditional administration stage, the fax, telephone, and active stage, and the effective electronic administration stage in transition from traditional to electronic administration. The e-management strategy is integrated bit by bit in this transition, thus people's resistance to organizational change is minimized. This is not only a challenge for the management but also the management itself-the so-called Internet challenge. E-management is more about technology than management; it is more about technology directed at management than technology directed at technology.

Electronic planning is dynamic and concerns strategic planning using short-term goals. Decisions are made electronically with an aim to serve and enable various departments and management. The aid of new knowledge systems, for example, decision support systems, expert systems, and artificial neural network systems, are used in work systems and processes. On the contrary, electronic planning differs from traditional planning because it is dynamic, flexible, and under ongoing development. Continuously audited digital information gives continuity to the company for planning, making it continuous planning from intermittent time planning.

Electronic planning in general is horizontal planning that starts to form a shape between management and employees. E-planning organizations find the possibility, through e-management, of adjusting to the technological weight of the Internet for remote organization and control.

Najm and Ghanem define an electronic organization as a loose structure of authority, tasks, and horizontal network relationships that seek instantaneous coordination and shared objectives (Kurana, & Alim, 2006). They stated that modern organizations need new changes in their organizational structure to solve some traditional administrative problems, such as new administrative units necessary to manage the databases, information, technical support, and electronic customers (Boutaleb and Toukabri, 2024).

2.1. Previous Studies

The study attempted to determine the strategy of digital transformation in the Sultanate of Oman, along with its plans, reality, and future trends. This study has followed a descriptive qualitative approach that uses semi-structured interviews. Therefore, a sample of 14 interviews from four government institutions was conducted (Al-Bar, 2018). The results indicated that the Sultanate had shown interest in the field of information technology and that it had a special plan regarding digital transformation (Yesser E-Government Program, 2019). This study also investigated the transformation of health services and found out that healthcare services have passed through several stages, ranging from digitization of patient files to decision-making support (Mohamed, 2020). This transformation was still going on and required governmental and financial support, of new generations of specialists in digital health care (Al-Rawashdeh, 2022). The assessment of modern technologies with regards to their transparency and privacy has not been estimated appropriately (Al-Husseini, & Bint Ahmed, 2013). The study also explored the status of knowledge managers in Saudi university libraries in the digital era and found the convergence of concepts of implicit and explicit knowledge and the skills of library workers (Nadeem, 2018). The current study will also explore the impact of digital transformation on Palestinian media with regard to the role of content, technologies, and financial needs (Siyasi, 2019). The results therefore indicate that the Palestinian media should support the concerned ministries to introduce necessary equipment and technology which will be able to keep pace with the developments in the arena of digital broadcasting (Al-Haroun, & Barakat, 2019).

Hence, this study, underpinned by the RBV theory, has sought to examine how digital transformation mediates IT capability with corporate business (Al-Ruhaili & Al-Dhuhawi, 2020). It had established that IT capability positively impacts the process of digital transformation and an organization set amidst digital technologies would compel performance (Joseph & Yaman, 2016). It underlines facts that digital transformation is of paramount importance in designing and supporting corporate performance, and companies investing in digital transformation can make innovative investments that translate into the development of customer experience and performance (Al-Humaidi, 2019)

This research also focuses on the implementation of e-government in the municipal councils of the Riyadh region and determines the capabilities and frameworks that enable it to be implemented (Al-Humaidi, 2019). Among these findings: e-government enhances the services provided to citizens and institutions, solving some problems and raising the efficiency of performance (Al-Munee & Al-Jawhara, 2022). This, while the study emphasizes the role of obstacles that may hinder the optimal application of e-government in municipal councils, such as weakness in the culture of citizens regarding the services provided through their websites (Al-Saudi, R. M. M., & Ramadan, 2019).

In the investigation of driving factors for the effectiveness of electronic customer relationship management systems, such as cost, technology acceptance, and employee's satisfaction about the overall perceived effectiveness of e-CRM systems, it was observed that the perceived lower cost regarding implementation and maintenance was positively related to increased perceived effectiveness; technology acceptance positively influenced their effectiveness; perceived usefulness and perceived ease of use were also positively linked with their effectiveness (Al-Oufi & Al-Jabr, 2022). Employee satisfaction with the e-CRM system should, therefore, be regarded as a major determinant of the system's effectiveness (Al-Shammari, 2022). These are, thus, the key factors that are necessary to ensure overall effectiveness in e-CRM system implementation for managing customer relationships (Al-Ghamdi & Aziza, 2022).

This paper has analyzed the unified theory of technology acceptance and use model in the context of an electronic document management system (Al-Qahtani, 2021). The results found significant contributions between performance expectancy and effort expectancy in the behavioral intention to use the system among users, while social influence and facilitating conditions have an indirect influence on the behavioral intention through these factors (Al-Balushi, 2019). The findings emphasize that an e-document management system should also be implemented concerning the expectation and perception of users, and for this, effective communication on such factors becomes essential (Toukabri et al., 2022, 2021, 2020, 2019, 2017; Toukabri, 2024, 2023, 2022, 2020, 2015, Toukabri & Ghali, 2017) and (Al-Shiha & Al-Khalawi, 2017).

2.2. Hypotheses

Main hypothesis: Northern Border University's administrative performance is statistically significantly impacted by digital modernity.

Three sub-hypotheses emerge from this hypothesis according to the dimensions of digital modernity, namely:

- The first sub-hypothesis is that the growth of administrative work at Northern Border University has a statistical relation with employees' knowledge of digital systems.
- The second sub-hypothesis is that the development of administrative performance in the Northern Border University and the impact of digital transformation are statistically significantly correlated.
- The third sub-hypothesis: There is a statistically significant effect between the contribution of digital management systems and the improvement of employee performance at the university.
- The fourth sub-hypothesis: The benefits and challenges of digital modernity have a statistical influence on the development of administrative performance at Northern Border University.

3. METHODOLOGY

The approach carried out in the current study is an analytical descriptive one, through:

- A review of previous studies conducted in this respect by using the theoretical results for the development of the structure of knowledge encompassing most the trends of researchers related to the subject under investigation.
- Using the perspective questionnaire of faculty members as a tool for the current study in gathering data.

3.1. The Limitation of the Study

The study limits are limited to the following objective, human, spatial and temporal limits:

- Objective limitations: The subject of the study is limited to "The impact of digital modernity on administrative performance in Saudi universities, Northern Borders University, a case study"
- Human limitations: Administrative employees at Northern Borders University in Saudi Arabia.
- Spatial limitations: The spatial limits of the study are limited to Northern Borders University.
- Temporal limitations: Academic year: 2022-2023 AD.

3.2. Statistical Framework

The questionnaire was used as a tool to collect data related to the study, due to the nature of the study in terms of its objectives, methodology and community. The questionnaire is considered one of the most widespread and widely used research tools in various fields of science. It is more effective in terms of saving time and reducing costs, and helps in collecting data on the largest number of individuals compared to other methods. It also facilitates answering some questions that require time by the respondent, and is considered more effective if the sample is geographically distributed widely. In this regard, the researcher has relied on the tool of the questionnaire to collect information from the participants in the sample to obtain data that serves the theoretical study included in the applied part, answers the questions, and achieves the objectives of the research.

3.3. The Analysis was Conducted as Follows

After the data had been coded and fed to the computer, various suitable statistical techniques were applied through SPSS so as to achieve the goals of the study through the analysis of the data collected.

Frequencies and percentages were calculated to establish the functional and personal characteristics of the members who made up the study sample, and to establish how they responded to the key terms in the study instrument. Subsequent to this, the following statistical measures were calculated:

- Arithmetic mean (Mean): It is informative, in order to arrange the research phrases according to the highest weighted arithmetic mean, to know what degree the study members have risen or decreased in response to the study questions (the average of the phrase averages). It therefore follows that the standard deviation has been used to determine how much the members of the study sample answered each statement of the study variables and each of the main axes has deviated from their arithmetic mean. It is important to notice here that the standard deviation indicates the variation in the answers of the study sample members for each of the statements of the study variables of the main axes. The closer its value is to zero, the more concentrated the responses are and the less dispersion they are between the scale.
- Pearson's correlation coefficient "Person Correlation" was used: to identify the degree of correlation between each question of the study.
- The researcher used Cronbach's Alpha coefficient: to test the stability of the study tool.

3.4. Study Sample

The sample is: a partial unit of the community chosen by the researcher using different methods and includes a number of individuals and carries the characteristics of the original community (Dhoqan, Obaidat, p. 110). The sample was selected by applying the statistical equation (Herbert Arkan equation), and the size of the community was (788). After applying the equation, the sample number reached (389.02). After applying the conditions, I selected the sample, which reached (395) employees from the Northern Border University in the Kingdom of Saudi

Arabia. The questionnaire was applied based on the following conditions:

- To be an employee at the Northern Border University
- The sample includes all administrative positions.

Table 1: The main characteristics of the sample.

Category	Frequency	Percentage
Gender		
Male	329	83.30%
Female	66	16.70%
Total	395	100%
Age		
Under 30 years	48	12.15%
30-40 years	112	28.36%
40-50 years	164	41.52%
50 years and above	71	17.97%
Total	395	100%
Current Job		
Administrator	49	12.41%
Assistant Professor	52	13.16%
Associate Professor	38	9.62%
Professor Doctor	28	7.1%
Supervisor	97	24.55%
Employee	131	33.16%
Total	395	100%
Experience		
Less than 5 years	89	22.53%
5-10 years	197	49.88%
10-15 years	86	21.77%
More than 15 years	23	5.82%
Total	395	100%
Number of Training Courses		
None	66	16.71%
1-3 Training Courses	295	74.68%
4-7 Training Courses	34	8.61%
8-10 Training Courses	0	0%
Total	395	100%
Educational Qualification		
Secondary	38	9.6%
Diploma	47	11.9%
Bachelor's	135	34.2%
Postgraduate Studies	47	11.9%
Doctorate	128	32.4%
Total	395	100%

4. RESULTS

Main hypothesis: Northern Border University's administrative performance is statistically significantly impacted by digital modernity.

This section seeks to identify the effect of the independent study variable (the extent of employees' awareness of digital systems, the contribution of digital transformation, the contribution of digital management systems, the advantages and obstacles of digital modernity) on the dependent variable, administrative performance at Northern Border University.

Table 2: Results of the test of the impact of digital modernity on administrative performance at the Northern Border University.

Source	Sum of squares	Degree of Freedom	Mean square	Significance Level (F)	Signfication (F)
Regression	102.596	3	34.199	262.669	0.000

Results of the first axis: The university's contribution to employees' awareness of digital systems in developing administrative work at the Northern Borders University:

To answer this question, which is the extent of the respondents' response regarding the statements of the first axis to verify and predict data through the contribution of the Northern Borders University to employees' awareness of digital systems in developing work, the arithmetic means, the following table displays the results of the calculations of standard deviations and ranks for the study participants' responses:

Table 3: Based on the averages of agreement, study participants' answers to the first axis statements are sorted in descending order.

No.	Statements	Mean	Standard Deviation	Relative Weight	Rank
1	Digital technologies are available to university staff to understand work behaviors and needs	4.61	0.57	92%	1
2	The university promotes core values and organizational culture for digital transformation	4.46	0.69	89%	3
3	The university has a media team to promote digital transformation culture	4.46	0.84	89%	2
4	The university helps in disseminating the advantages of digital transition within the administrative system to all staff	4.29	0.85	86%	7
5	The university raises awareness of the digital capabilities, threats, and opportunities within the university	4.36	0.73	87%	5
6	The university is concerned with educational courses for its staff about the importance of digital transformation in the university	4.37	0.73	87%	4
7	The university allocates websites for staff to keep up with the latest developments in the field of digital transformation	4.32	0.72	86%	6
General Mean and Standard Deviation		4.41	0.55	88%	

The second axis shows the results of how administrative performance has been improved at Northern Borders University through the process of digital transformation. A non-parametric test was conducted using arithmetic averages, standard deviations, and ranks to compute the responses that participants gave in response to the following question: To what degree would the response of participants regarding the statements of the second axis be, which relates to the contribution of digital transformation in developing administrative performance at Northern Borders University. Results are presented in the table below:

Table 4: Based on the averages of agreement, the study participants' answers to the second axis statements are sorted in descending order.

No.	Statements	Mean	Standard Deviation	Relative Weight	Rank
1	Management provides training programs to enhance the technical performance of staff	4.25	0.80	85%	2
2	Digital transformation achieves operational efficiency in university administration	3.96	0.96	79%	5
3	Digital transformation helps the university management make appropriate decisions	3.75	1.27	75%	6
4	Digital transformation fosters innovation and creativity in enhancing employee performance	3.96	1.04	79%	4
5	Digital transformation contributes to defining strategies, goals, and activities necessary to activate administrative performance at the university	4.21	0.74	84%	3
6	Digital transformation contributes to establishing a system for measuring and monitoring digital transformation and keeping up with administrative development	4.29	0.66	86%	1
7	The university management provides all technical needs for moving towards digital transformation	3.74	1.28	81%	7
General Mean and Standard Deviation		4.07	0.74	81%	

Results of the third axis: The contribution of digital administrative systems to improving the performance of employees at the university. To answer this question, which is the extent of the respondents' response regarding the statements of the third axis: The contribution of digital administrative systems to improving the performance of

employees at the Northern Border University, the arithmetic means, the following table displays the results of the calculations of standard deviations and ranks for the study participants' responses:

Table 5: Based on the averages of agreement, study participants' answers to the third axis statements are sorted in descending order.

No.	Statements	Mean	Standard Deviation	Relative Weight	Rank
1	The application of digital modernization leads to faster processing of transactions for university reviewers	4.04	100	81%	6
2	Digital administrative systems contribute to achieving transparency and quality of performance	4.14	0.76	83%	1
3	The application of digital transformation provides employees with a channel to deliver high-quality work	4.10	0.94	82%	2
4	Digital systems achieve efficiency, effectiveness, and ease of access to outstanding job performance	4.06	0.97	81%	4
5	Digital systems make it easier for employees to understand the procedures involved in executing administrative transactions	4.00	0.98	80%	7
6	The university provides all digital transformation programs needed by employees	4.05	111	81%	5
7	The university provides all digital maintenance devices to repair malfunctions and ensure continuous operation	4.07	0.98	81%	3
General Mean and Standard Deviation		4.07	0.74	81%	

Results of the fourth axis: Advantages and obstacles of digital modernity on administrative performance at the Northern Border University: To answer this question, which is the extent of the respondents' response regarding the statements of the fourth axis, the advantages and obstacles of digital modernity on performance at the Northern Border University, the arithmetic means, The table below shows the results of calculation of standard deviations and ranks for the responses by study participants:

Table 6: The responses of study members to the statements of the fourth axis are arranged above in descending order according to the averages of agreement.

No.	Statements	Mean	Standard Deviation	Relative Weight	Rank
1	Digital systems contribute to simplifying administrative work procedures at the university	4.26	0.82	83%	2
2	Digital transformation reduces the time taken to complete transactions at the university	3.95	0.96	78%	5
3	Digital transformation provides a database that helps develop the university's operations	3.75	127	75%	6
4	Digital systems enable the university to easily communicate with the Ministry of Education and other universities to understand new guidelines and instructions and keep up with developments	3.96	104	80%	4
5	Digital modernization at the university allows services to be provided to employees anywhere they are	3.73	127	80%	7
6	Digital systems facilitate dealing with electronic systems	4.30	0.66	87%	1
7	Digital transformation contributes to protecting the information and programs used by the university	4.22	0.75	83%	3
General Mean and Standard Deviation		4.07	0.74	81%	

According to the survey, most participants concur on the benefits and challenges of digital modernity for Northern Border University performance. However, there are also some obstacles. The highest agreement was found in the statement "Digital systems facilitate dealing with electronic systems," followed by "Digital transformation contributes to protecting information and programs used by the university." The statement "Digital systems contribute to simplifying administrative work procedures at the university" was also strongly agreed upon.

The study found that 83.30% of the sample members were male, with 66 females. The majority were aged 40-45, with 41.52% being older. Most current jobs were employees, with 24.55% being supervisors, 13.16% as assistant professors, 12.41% as administrators, 9.62% as associate professors, and 7.1% as professors. Practical experience ranged from 5-10 years, with 49.88% having experience. Most members obtained 1-3 training courses, with 74.68% obtaining them. The majority had an academic qualification, with 34.2% having a bachelor's degree, 32.4% having a doctorate, 11.95% having postgraduate studies, and 9.6% having a secondary school.

5. CONCLUSION

The study explores the impact of digital modernity on administrative performance in Saudi universities, specifically at Northern Border University. The research aims to understand employees' awareness of digital systems, their contribution to administrative work, and the advantages and obstacles of digital modernity. The theoretical framework is discussed, along with previous studies. The study methodology is described using a descriptive approach, with a sample size of 395 individuals. The study tool is prepared and validated, and statistical methods are identified. The field study is conducted, with demographic data analysis and hypothesis testing. The study concludes with a summary, key results, and recommendations.

The Northern Border University must invest in a robust digital infrastructure to support administrative operations, including upgrading hardware, software, and network capabilities. Implement an integrated information system to streamline tasks like student registration, grades, and resource allocation. Provide comprehensive training programs for faculty and staff to use digital tools effectively. Expand online services, prioritize cybersecurity, and enhance collaboration through digital platforms. Continuously assess the impact of digital modernity on administrative performance and explore opportunities for automation, artificial intelligence, and data analytics. Foster a culture of innovation by providing resources and support for administrative staff to develop innovative digital solutions.

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