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The Impact of E-Management on Improving Crisis Management, a Field Study at the Ali Boushaba Public Hospital in Khenchela

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Abstract:

This study aims to identify the impact of e-management on improving crisis management at the Ali Boushaba Public Hospital in Khenchela to raise awareness about e-governance. To achieve the study objectives, we employed the descriptive approach. We adopted the questionnaire as the main tool for collecting primary data. 40 forms were distributed to managers, sub managers and heads department. 36 valid forms were retrieved for analysis. After statistical analysis of the data using SPSS, the study found a statistically significant impact of e-management in improving crisis management at the Ali Boushaba Public Hospital in Khenchela through the administrative, technical and human resources efficiency dimensions.

Keywords: E-management; Crises; Crisis management.

Jel Classification Codes: H8, H00, H12

1. INTRODUCTION:

The world is undergoing a considerable technoinformatic revolution that has compelled most institutions to abandon traditional management and transit towards e-management to keep pace with ongoing developments, aiming to adopt flexible and efficient work methods and seeking to provide services to citizens under all circumstances, particularly in the present crisis-ridden times.

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Like other organizations, health institutions are susceptible to different health-related, engineering-related, or other **crises. The recent COVID-19 crisis and the subsequent isolation and quarantine measures to prevent the virus's spread clearly show these institutions' limitations** in fully providing services, especially during the peak times of the virus. This pressure prompted many of these institutions to consider relying on an electronic system to keep citizens continuously informed during isolation. This idea became apparent after the crisis when the application of this concept became widespread. In this context, this study aims to answer the following question:

What is the impact of e-management on improving crisis management in the public hospital institution in Ali Boushaba, Khenchela?

To answer this question, we raise the following sub-questions:

- What is the impact of senior management on improving crisis management at the public hospital in Ali Boushaba, Khenchela?
- What is the impact of technological resources on improving crisis management at the public hospital in Ali Boushaba, Khenchela?
- What is the impact of human resource efficiency on improving crisis management at the public hospital in Ali Boushaba, Khenchela?

1.1.Hypotheses:

To answer the main question, we formulated the following hypotheses:

- **Main Hypothesis**: "E-management has a statistically significant effect on improving crisis management in the public hospital institution in Ali Boushaba, Khenchela."

Sub-Hypotheses:

- There is a statistically significant effect of senior management on improving crisis management in the public hospital in Ali Boushaba, Khenchela, at a significance level of (0.05).
- There is a statistically significant effect of technological resources on improving crisis management in the public hospital in Ali Boushaba, Khenchela, at a significance level of (0.05).
- There is a statistically significant effect of human resource efficiency on improving crisis management in the public hospital institution in Ali Boushaba, Khenchela, at a significance level of (0.05).

1.2.Research importance:

The significance of this research lies in its attempt to highlight e-management and its role in improving crisis management in hospital institutions. What distinguishes this present research is its emergence within the context of a real crisis, namely the COVID-19 crisis. Thus, this research will be part of the efforts to confront the consequences of this crisis.

1.3.Research Objectives:

This research aims to:

- Build a theoretical framework on e-management and crisis management, regarding them as essential topics in the present time.
- Raise the study institution's interest in the effective role played by e-management in improving crisis management.
- Support the electronic culture among employees and attempt to leverage it in dealing with crises.

2. E-Management

2.1.E-Management Concept:

Electronic management is regarded as one of the most important outcomes of the digital revolution the world is experiencing. Therefore, most definitions of this term mainly focus on information and communication technology. The following are some of these definitions:

- It is "the use of electronic means and technologies with everything required for practice, organization, procedures, commerce, or advertising" (Dahmani & Gherbi, 2023, p. 978)
- It is the deployment of information and communication technology in the institution's functions to ensure integration between its departments to fulfill its goals, invest resources, and enhance its performance (Bouklia, Chikhi, & Bouarioua, 2021, p. 264).

2.2. E-Management Dimensions:

There is a difference among researchers concerning the adoption of the dimensions of electronic management which can be determined as follows:

2.2.1. Administrative Dimension

Senior management plays a significant role in the success of organizational and administrative operations at any level. The conviction, understanding of responsibilities, clarity of their strategic vision, and embracing of the concept of e-management and its executive and developmental roles significantly affect the

success of e-management. It is a fundamental factor in supporting transformation processes and application phases. Thus, administrative and leadership styles must evolve with the times. The electronic organizational structure of any institution should be based on the following:

- Electronic organizational structure, individuals and human resources, work procedures, and policies.
- Organizational cultures of the institution, particularly electronic culture, include computers, information, and electronic culture.
- The level of the electronic institution and understanding of the technical dimensions of technology can provide managerial and organizational solutions required by the environment to help secure value for institutions and organizations.
- The level of core business units and management of relationships between them, management of alliances, and external relationships with environmental elements (Manzar, 2021, pp. 107-108).

2.2.2. Technical Dimension

Providing the infrastructure for e-management, encompassing developing and improving the communication network to be integrated and ready for use. It should simultaneously accommodate the vast amount of communications to fulfill the goal of employing communication networks (Internet, intranet, and extranet). Furthermore, offering appropriate digital technology, involving equipment, computers, devices, systems, databases, and software, makes all of this available for individual or organizational use on the widest possible scale (Al-Najjar & Al-Ani, 2021, p. 120).

2.2.3 Human Dimension

The human dimension in the e-management system refers to the experts and specialists working in the field of knowledge, representing the human and functional structure of the e-management system. This is the most significant element in the e-management system (Al-Dulaimi & Al-Janabi, 2022, p. 318).

3. Crisis Management

A crisis is regarded as a deviation from routine and normal operating patterns for an individual or organization due to the effect of an event or a series of events (Eric & Rapt, 2016, p. 2). Thus, an organization must rely on crisis management as a system that allows the organization to respond to emergencies and unfamiliar situations that may occur occasionally.

3.1. Crisis Management Concept:

The term "crisis management" has been given various definitions, including:

- It is "the measures and methodologies used to determine the damages, complications, control, and limit the crisis" (Canyon, 2020, p. 8)
- It is a series of functions and processes sought at detecting potential crisis indicators, developing tools and strategies to prevent or mitigate crises, and swiftly recovering from them. It includes different activities and procedures to deal with unfamiliar situations, intending to model procedures and decisions that affect the crisis (Aissaoui & Elhazzam, 2021, p. 1140).

In light of the above definitions, *crisis management* can be defined as **a set of interconnected functions aimed at discovering warning signs sent by crises before their occurrence, to prevent them or to devise strategies and mechanisms to mitigate their negative effects.**

3.2. Crisis Management Stages:

There is a difference among researchers in the field of crisis management concerning the crisis management stages. However, they are generally classified into three main stages, which we will discuss in detail.

3.2.1. Pre-Crisis Management Stage:

This stage is regarded as the most intensive in terms of effort and significance (Waryjas, 1999, p. 2). Managing this stage relies on three main pillars:

- Implementing preventive strategies for crises.
- Predicting potential crises.
- Planning to face potential crises and training the team on the plan.

3.2.2 Crisis Management Stage:

If the organization fails to avoid a crisis, it attempts to mitigate its negative impacts after diagnosing it. This includes selecting the appropriate intervention strategy based on the scientific methodologies employed and the nature and circumstances of the crisis (Boulguamah, 2016, pp. 23-24).

3.2.3. Post-Crisis Management Stage:

The post-crisis stage starts by analyzing the organisation's present situation (post-crisis situation) and employing new directions in light of the crisis's impacts. Feedback helps determine new policies for the organization, possibly leading to a modification or change in its mission. The organization must reposition itself,

making the required changes in the structure, systems, processes, and more (Abu Farah, 2009, p. 239).

3.3 The Relationship Between E-Management and Crisis Management

E-management works to address crises by providing the following points:

- Offering a database and detailed information about the institution's resources and treasury that can be referred to when needed, ensuring that the management is supplied with the required information during a crisis, and facilitating the mobilization and transfer of resources with high flexibility between the branches of the institution and supplying the impacted branch with what it needs.
- Electronic archiving of documents related to the institution's transactions allows easy retrieval and preservation of them from damage. Searching for a file or a document takes only a few seconds.
- Establishing a record of events and crises experienced by the institution, providing the ability to solve part of the crises by simulating previous decisions in similar crises.
- Transfer and exchange of information, ideas, and crisis-related instructions between the crisis team leader or senior management of the institution and the other team members or field teams employing fast communication channels to convey the appropriate quantity and type of information at the right time for the decision-maker to make the appropriate decision.
- The ability to manage the institution and, thus, crisis management from anywhere, particularly during times when mobility and access to headquarters are difficult, with the possibility of holding remote meetings, enabling the transfer of files and data between participants, particularly regarding resources, capabilities, and crisis indicators.

The processes of assessing routine and recurring situations for the external and internal environment of the institution include accessing and regularly updating data, implying effective alert and warning systems that may reach the level of continuous monitoring of the security and safety levels within the organization (Al-Najjar & Al-Ani, 2021, p. 122).

4. Applied Study

4.1. Study Population:

The research population consists of the manager, sub-managers, and heads of departments working at the public hospital institution in Ali Boushaba.

4.2 Questionnaire Reliability Coefficient:

Cronbach's alpha coefficient was employed to calculate the reliability coefficient. Table No. 05 illustrates this:

Table 01. Indicates the reliability values for the study questionnaire employing Cronbach's alpha method

N°	Axis title	Items N°	Cronbach's alpha value	Statistical significance
01	Electonic management	17	0.88	Function
02	Crisis Management	11	0.87	Function
05	Questionnaire as a whole	28	0.91	Function

Source: Compiled by the researchers relying on SPSS outputs.

Table No. 01 indicates that Cronbach's alpha values for the two questionnaire axes, E-Management, Crisis Management, and the questionnaire as a whole, fall within the range [0.87, 0.91]. These high values indicate that the study questionnaire has a high reliability coefficient.

4.3. Study Sample Characteristics:

The following table illustrates the frequencies and percentages describing the study sample according to gender, age, occupation, and years of experience:

Table 02. Indicates an overview and analysis of the results of the personal data section

Personal data		Frequency	Percentage (%)
Gender	Male	24	66.70
	Female	12	33.30
Age	Less than 30 years	00	00
	30-40 years	08	22.20
	41-50 years	09	25
	More than 50 years	19	52.80
Occupation	Manager	01	2.80

	Sub – Manager	04	11.10
	Department Head	31	86.10
Years of Experience	Less than 05 years	02	5.60
	05-10 years	13	36.10
	11-15 years	05	13.90
	More than 15 years	16	44.40

Source: Prepared by the researchers relying on SPSS outputs.

Sample Distribution by Gender Variable: Table 02 shows that the majority of employees, comprising 66.70%, are males, while the minority, constituting 33.30%, are females.

Sample Distribution by Age Variable: Examining Table 06, 52.80% of employees surpass 50, while 25% fall within the age range of 41 to 50. Furthermore, 22.20% are in the [30-40 years].

Sample Distribution by Occupation Variable: Referring to Table 06, we notice that 86.10% of employees hold the department head position, 11.10% occupy the deputy manager role, and 2.80% are in managers positions.

Sample Distribution by Experience Variable: Based on Table 06, 44.40% of employees have professional experience exceeding 15 years, 36.10% have experience ranging between 05 and 10 years, 13.90% have experience between 11 and 15 years, and the remaining 5.60% have less than 05 years of professional experience.

4.4. Presentation and Analysis of Study Axes Results:

4.4.1. Presentation and Analysis of Administrative Dimension Results:

Table 03. Shows the presentation and analysis of the administrative dimension results

N^{o}	Item	Mean	SD	Ranking	Item trend
01	Senior management has a high belief in the importance of implementing electronic management in the organization	3.33	1.41	04	Agree
02	Senior management is interested in providing all requirements for applying electronic management	3.47	1.32	02	Agree

03	Senior management is keen to attract individuals with administrative competencies who deal efficiently and effectively with technology Information and contact	3.47	1.25	03	Agree
04	Senior management is keen to get rid of bureaucratic and routine procedures that hinder the process of development and renewal	3.28	1.34	05	Neutral
05	Senior management works to spread electronic culture among employees	3.67	1.26	01	Agree
Administrative dimension		3.44	1.17	Agree	

Source: Prepared by the researchers based on the outputs of SPSS.

Table 03 indicates that the mean for the administrative dimension was 3.44, with a standard deviation of 1.17. According to the study scale, the general trend for this dimension leans towards the alternative "Agree," showing that the sample individuals agree with the administrative dimension. There is variation and dispersion in the responses of the sample individuals, as the standard deviation is greater than one.

Item number (05) occupied the first rank with a mean of (3.67), indicating dispersion around the agreement of the sample individuals that senior management works to promote electronic culture among employees. On the other hand, item number (04) ranked last with a mean of (3.28), indicating a neutral tendency among the sample individuals regarding whether senior management is committed to eliminating bureaucratic and routine procedures that hinder progress and innovation.

4.4.2. Presentation and Analysis of Technical Dimension Results

Table 04. Indicates the presentation and analysis of the technical dimension results

N^{o}	Item	Mean	SD	Ranking	Item trend
06	The hospital keeps pace with the speed of technological developments	2.78	1.29	07	Neutral

07	The hospital keeps pace with updates in digital programs	2.58	1.20	08	Disagree
08	The hospital has effective programs in place to protect devices from viruses.	2.83	1.34	06	Neutral
09	The hospital has an external communication network that connects it with other hospitals and relevant departments	3.28	1.34	04	Neutral
10	The hospital has an internal communication network to connect all departments	3.53	1.42	01	Agree
11	There are frequent interruptions in the internet network in your department	3.47	1.42	03	Agree
12	The hospital allocates financial resources to acquire computers and electronic devices	3.06	1.35	05	Neutral
13	The hospital allocates financial resources for the maintenance of electronic devices	3.50	1.32	02	Agree
Technical dimension		3.13	0.97	Neutral	

Source: Prepared by the researchers based on the outputs of SPSS.

Table 04 indicates that the mean for the technical dimension was (3.13) with a standard deviation of (0.97). According to the study scale, the general trend for this dimension falls in the "Neutral" direction. The standard deviation, being greater than one, indicates variation and dispersion in the responses of the sample individuals.

Item number (10): "The hospital has an internal communication network to connect all departments" ranked first with a mean of (3.53) and a standard deviation of (1.42). On the other hand, item number (07) ranked last, with a mean of (2.58) and a standard deviation of (1.20, indicating a lack of agreement among the sample individuals regarding the hospital's alignment with digital program updates.

4.4.3 Presentation and Analysis of Human Dimension Results

Table 05. indicates the presentation and analysis of the results of the human dimension

N°	Item	Mean	SD	Ranking	Item trend
14	The hospital has a sufficient number of specialists (engineers and technicians) in informatics	2.53	1.16	04	Disagree
15	Engineers and technicians inspect all hospital departments for the purpose of monitoring	2.72	1.16	03	Neutral
16	Engineers and technicians monitor malfunctions in the equipment used within your facility.	2.89	1.19	02	Neutral
17	Engineers and technicians help you use electronic technologies	3.03	1.44	01	Neutral
Human dimension		2.79	1.07	Neutral	
Electonic management		3.12	0.83	Neutral	

Source: Prepared by the researchers based on the outputs of SPSS.

Table 05 indicates that the human dimension's mean was (2.79) with a standard deviation of (1.07). According to the study scale, this dimension tends towards the "Neutral" option. Item number (17): "Engineers and technicians are available to assist you in employing electronic technologies" ranked first with a mean of 3.03 and a standard deviation of 1.44. On the other hand, item number (14): "There is a sufficient number of experts (engineers and technicians) in informatics in the hospital", ranked last with a mean of 2.53 and a standard deviation of 1.16. The mean for the overall electronic management axis was estimated at 3.12 with a standard deviation of 0.83

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4.4.4. Presentation and Analysis of Crisis Management Axis Results

Table 06. Indicates the presentation and analysis of the crisis management axis results

N°	Item	Mean	SD	Ranking	Item trend
18	The hospital conducts a comprehensive and organized scan of the working environment to identify signs of potential crisis occurrence.	2.44	1.27	10	Disagree
19	Senior management is interested in identifying signals of crises	2.36	1.31	11	Disagree
20	The hospital has a clear vision when making decisions to confront the crisis	2.83	1.30	09	Neutral
21	The hospital prepares alternatives to resolve most of the crises it may encounter.	2.89	1.45	08	Neutral
22	The hospital has the ability to simulate previous decisions to help solve similar situations	3.17	1.38	07	Neutral
23	There is a high degree of flexibility in delegating authorities to make decisions when the situation requires it.	3.17	1.42	06	Neutral
24	The hospital focuses on mobilizing resources to benefit any interest when it is needed	3.47	1.38	04	Agree
25	The hospital has a staff with previous experience in dealing with crises	3.53	1.48	01	Agree
26	The hospital extracts lessons and insights from crises to ensure they do not occur again.	3.50	1.40	03	Agree
27	Hospital management learns how to handle crisis management from other hospitals	3.39	1.38	05	Neutral

28	The hospital management disseminates the lessons learned from crises.	3.50	1.58	02	Agree
Crisis management axis		3.11	1.07	Neutral	
Questionnaire as a whole		3.12	0.86	Neutral	

Source: Prepared by the researchers based on the outputs of SPSS.

Table 06 indicates that the mean for the Crisis Management axis was 3.11 with a standard deviation of 1.07. The overall trend for this dimension was towards the "Neutral" alternative. Item number (25): "The hospital has a team with previous experience in dealing with crises" ranked first with a mean of 3.53 and a standard deviation of 1.48. On the other hand, item number (19): "Top management is concerned with identifying signs of crises", ranked last with a mean of 2.36 and a standard deviation of 1.31. The mean for the entire questionnaire was estimated at 3.12 with a standard deviation of 0.86, where the overall trend for the axis as a whole was towards the "Neutral" alternative.

4.5. Testing Hypotheses

4.5.1. Verification of the First Sub-Hypothesis: Senior management has a statistically significant impact on improving crisis management in the public hospital of Ali Boushaba, Khenchela.

Table 07. Indicates the results of simple linear regression for the role of top management in improving crisis management in the public hospital

Independent variable	Regression coefficient	Beta	Value t	Sig	**Correlation Coefficient** R	R^2	Value f	Sig
Constant	2.06	0.34	3.82	0.001	0.34	0.11	4.30	0.046
Administrative dimension	0.31		2.07	0.046				

Source: Prepared by the researchers based on the outputs of SPSS.

Table 07 indicates that the coefficient of determination (R square) was 0.11, indicating that the administrative dimension explains 11% of the variance in the dependent variable, represented by crisis management. The remaining 89% is attributed to other factors, variables not included in the table, and random sampling errors. We conclude that the F-value is statistically significant for simple linear regression analysis, with a test significance level of 0.046, which is less

than the error rate of 0.05. This supports the first partial hypothesis: "There is a statistically significant effect of senior management on improving crisis management in the public hospital of Ali Boushaba**,** Khenchela"

4.5.2. Verification of the Second Sub-Hypothesis: Technical resources have a statistically significant impact on improving crisis management in the public hospital of Ali Boushaba**,** Khenchela.

Table 08. Indicates the results of simple linear regression for the role of technical resources in improving crisis management in the public hospital

Independent variable	Regression coefficient	Beta	Value t	Sig	**Correlation Coefficient** R	R^2	Value f	Sig
Constant	1.07	0.59	2.15	0.04	0.59	0.35	18.56	0.000
Technical dimension	0.65		4.31	0.000				

Source: Prepared by the researchers based on the outputs of SPSS.

Table08 indicates that the coefficient of determination (R square) was 0.35, meaning that the technical dimension explains 35% of the variance in the dependent variable, represented by crisis management. The remaining 65% is attributed to other factors, variables not included in the table, and random sampling errors. We conclude that the F-value is statistically significant for simple linear regression analysis, with a test significance level of 0.000, which is less than the error rate of 0.05. This supports the second partial hypothesis: "There is a statistically significant impact of technical resources on improving crisis management in the public hospital of Ali Boushaba, Khenchela."

4.5.3 Verification of the Third Sub-Hypothesis: Human resource efficiency has a statistically significant impact on improving crisis management in the public hospital of Ali Boushaba, Khenchela.

Table 09. Indicates the results of simple linear regression for the role of human resource efficiency in improving crisis management in the public hospital

Independent variable	Regression coefficient	Beta	Value t	Sig	Correlation Coefficient R	R^2	Value f	Sig
Constant	1.55	0.56	3.62	0.001	0.56	0.31	15.33	0.000
Human dimension	0.56		3.92	0.000				

Source: Prepared by the researchers based on the outputs of SPSS.

Table 09 shows that the coefficient of determination (R square) is 0.35, indicating that the human dimension explains 31% of the variance in the dependent variable, represented by crisis management. The remaining 69% is attributed to other factors, variables not included in the table, and random sampling errors. We conclude that the F-value is statistically significant for simple linear regression analysis, with a test significance level of 0.000, which is less than the error rate of 0.05. This supports the third partial hypothesis: "There is a statistically significant impact of human resource efficiency on improving crisis management in the public hospital of Ali Boushaba, Khenchela."

4.5.4. Verification of the General Hypothesis: E-management has a statistically significant impact on improving crisis management in the public hospital of Ali Boushaba, Khenchela.

Table 10. Indicates the results of simple linear regression for the role of electronic management in improving crisis management in public hospitals

Independent variable	Regression coefficient	Beta	Value t	Sig	**Correlation Coefficient** R	R^2	Value f	Sig
Constant	0.58	0.63	1.05	0.30	0.63	0.39	22.15	0.000
E-management	0.81		4.71	0.000				

Source: Prepared by the researchers based on the outputs of SPSS.

Table 10 indicates that the coefficient of determination (R square) is 0.39, indicating that the electronic management variable explains 39% of the variance in the dependent variable, represented by crisis management. The remaining 61% is attributed to other factors, variables not included in the table, and random sampling errors. We conclude that the F-value is statistically significant for simple linear regression analysis, with a test significance level of 0.000, which is less than the error rate of 0.05. This supports the general hypothesis: "There is a statistically significant impact of e-management on improving crisis management in the public hospital of Ali Boushaba, Khenchela."

5. CONCLUSION:

The theoretical framework of this paper highlights that the transit towards e-management has become an inevitable necessity in the face of the growing severity of crises and their consequences, which have become a feature of our present era. The recent COVID-19 pandemic has emphasized the significant role of e-management in effectively handling crises.

In light of these results, the field study of this research paper elucidates the following points:

- There is a statistically significant impact of senior management on improving crisis management in the public hospital of Ali Boushaba, Khenchela.
- There is a statistically significant impact of technological resources on improving crisis management in the public hospital of Ali Boushaba, Khenchela.
- There is a statistically significant impact of human resource efficiency on improving crisis management in the public hospital of Ali Boushaba, Khenchela.
- There is a statistically significant impact of electronic management on improving crisis management in the public hospital of Ali Boushaba, Khenchela.
- We also found that the implementation of e-management at the departmental level is flexible and obstacle-free, unlike the Emergency Department, which still faces challenges in employing this approach due to increased pressure and time constraints.

Recommandations:

- It is essential for senior management to support the transit towards e-management and offer full material and organizational support.

- Hiring a larger number of engineers and IT specialists with a focus on continuous training to keep up with technological advancements.
- Encouraging both employees and patients to learn modern technologies.
- Promoting information culture by providing adequate hardware and software infrastructure.
- Applying an alarm system at the level of the public hospital administration in Ain Boushaba Khenchela to detect deficiencies throughout the institution and predict and address potential risks.
- Connecting all hospital departments to a high-speed internet network.
- Senior management should seek to eliminate routine and bureaucratic practices through different means, such as utilizing email to expedite procedures.
- Establishing a permanent crisis management team employing a scientific approach.
- Creating a hospital database to store information obtained from different departments, categorize, and organize it for quick access when needed.

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