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# E-government and logistical health services during Hajj season

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## Abstract

**Background:** Every year millions of Muslims travel to Saudi Arabia to perform the fifth pillar of Islam, the Hajj pilgrimage. Aligned with the Kingdom's 2030 vision, the Ministry of Health works to provide advanced free medical services to pilgrims by implementing digital transformation. Hajj service providing companies are concerned with offering high-quality logistical services and removing obstacles that may face the pilgrims including those related to health and safety. In order to integrate healthcare applications with effectiveness, there is a need to have a unified electronic platform.

**Results:** This paper uses both primary and secondary data. The primary data collection has been done through an electronic survey and interviews with a number of employees working for Hajj and Umrah companies and an interview with an employee in the health sector to support logistics health services. The secondary data have been collected through analyzing the official website of the Ministry of Communications and Information Technology.

**Conclusion:** Findings suggest that there is a lack of an integrating electronic interface of different applications that are provided by the companies involved and it is recommended that a unified medical database established as this could provide several benefits including informed decision-making, tracking of pilgrim's health status, and increased user satisfaction.

**Keywords:** E-government, Health logistic service, Pilgrim's satisfaction, Health applications

## Background

Every year, millions of Muslims from around the world travel to Mecca in Saudi Arabia to perform Hajj, one of the Islamic rituals. Both government and private organizations and individuals provide a variety of services and facilities to support these pilgrims and solve any difficulties they may encounter. Assessing pilgrim satisfaction offers information on how Hajj companies fulfill pilgrims' needs. When it comes to Internet-based services, Saudi Arabia is one of the leading countries in applying security policies in dealing with services. Although many studies

have been conducted in recent years to determine how best to provide facilities and protect pilgrims' data, it is still essential to consider the pilgrims' safety and security (Khan and Shambour 2016).

Hajj season is considered one of the biggest challenges to various sectors in the Kingdom of Saudi Arabia. It is one of the most critical targets for the responsible authorities. The government provides the necessary resources to serve the pilgrims through the various ministries concerned, such as the Ministry of Hajj and Umrah, the Ministry of Health, and others. Companies take advantage of the services by creating contingency plans to deal with any emergency threatening the pilgrims' health and safety.

This paper's main aim is to examine how to provide health logistics services through e-government. Technology currently serves as a significant means of delivering services (Alharbi et al. 2021). The Health Information

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The Hajj medical mission creates its strategic plan before the hajj season starts to ensure that all required tasks and actions are identified and well planned before the arrival of the pilgrims to the Kingdom of Saudi

- Transferring ill pilgrims to hospitals and supplying them with moral and material assistance.
- Receiving and moving those who are recovering to their accommodations.

Smartphones are currently an important part of digital life, allowing the tracking pilgrims' health through their use (Failed 2014). There are a number of smartphone applications that are currently used to facilitate the logistics of the pilgrims' health and safety. With the development of the technology of mobile phone applications, various health applications have been created. Pilgrims may use the applications on their smartphones to help them to perform the Hajj in comfort (Madi et al. 2020). Health applications, on the other hand, include a wide variety of services, such as critical care

monitoring, which necessitates high protection and reliability to transmit data to healthcare professionals in a timely manner (Vergütz et al. 2020). This includes the following applications:

#### **Asefny app**

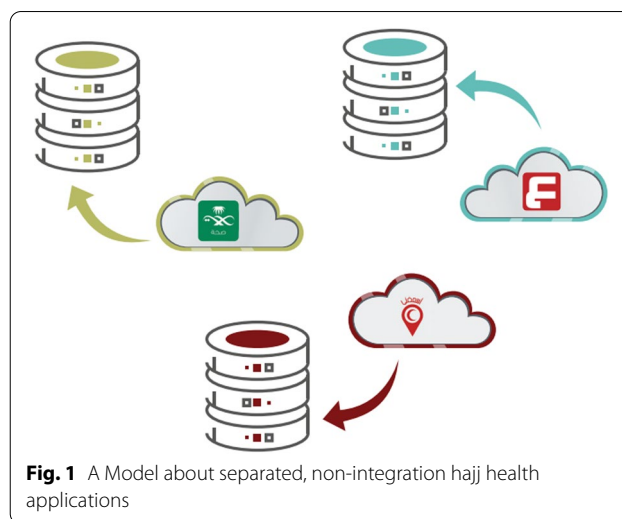
This application offers the following resources to complement the Saudi Red Crescent Authority's efforts: notifying the Saudi Red Crescent Authority of an emergency and enhancing location accuracy, using the SMS text messaging service to deliver an immediate distress message to the Red Crescent in the research of an extreme emergency, assisting people with disabilities in submitting information, keeping track of the status of reports and staying up to date with the latest developments, keeping a detailed record of medical history, illnesses, and medications to facilitate and speed up diagnosis, directing users to nearby medical services such as clinics, hospitals, and dispensaries, as well as drawing a route on a map to the facility, using the device's camera flashlight to send coded distress messages and warning lights and sounds to alert those nearby of the need for assistance, providing logistical support to volunteers (The unified national platform 2021).

#### **Sehha app**

This application provides access to medical consultations through text, speech, and video conversations provided by specialist doctors accredited by the Ministry of Health, as well as artificial intelligence tools that allow access to safe medical information automatically, provide creative and sustainable solutions to enable individuals to receive preventive and health care tips to enjoy a better level of health and fitness. In addition, it provides a health evaluation tool that asks users questions about their health and generates a report with health ratings based on disease statistics and discusses how lifestyle influences disease risk and recommends healthier lifestyle changes to lower risk (The unified national platform).

#### **Elaje app**

This is an electronic portal for the delivery of electronic medical services with the aim of making appointment scheduling easier. It also allows for the online purchasing medical equipment via an online medical supplier and facilitating the procedures for treatment services (The unified national platform) as shown in Fig. 1.



As Fig. 1 shows that the smart Hajj health applications to serve pilgrims are not interconnected; each application works separately from the other and has a different database.

## **Methods**

This paper's main aim is to examine how to provide health logistics services through e-government. Thus, the design of conducting this study included both primary and secondary data. Regarding the setting, the primary data collection has been done through an electronic survey and interviews with a number of employees working for Hajj and Umrah companies and an interview an employee in the health sector to support logistics health services. The secondary data have been collected through analyzing the official website of the Ministry of Communications and Information Technology. The authors of this research confirm that this study does not need to be submitted and approved by our institutional ethics committee neither needed "Ethics and Consent to Participate." Therefore, it is deemed unnecessary according to Saudi national regulations with regard to collecting general information that is not sensitive or personal.

## **Results**

To understand the association between health applications in Hajj and how they affect the enhancement of health services (Drydakis 2021), primary and secondary data have been collected. Primary data were collected through a four-question close-ended survey instrument validated by experts, and open-ended interviews. The data were integrated and analyzed. The first interview was with employees of Hajj and Umrah companies, (Al Nour Camp Company, Al Falah Company, Campaign

Al Abrar Company, and Campaign Al Mahmal Company). The second interview was with a health sector employee. The second interview was to gain insight into the required procedures are to ensure following the right steps while taking care of sick pilgrims. Then, to gain further information and support the study, an electronic survey was established using Google Forms. 30 respondents answered the four survey questions. (See Appendix A for survey questions). Each question required the respondent to choose one of the three possible responses. Secondary data were collected through the official website of the Ministry of Communications and Information Technology.

Responses were almost uniform as follows:

There was universal agreement that the instruction the respondent was employed by provided logistical health services for the pilgrims (see Fig. 2).

66.7% of respondents said that the time has come for a technical shift in their organizations and patient care,

providing more accurate and high-quality service (see Fig. 3).

83% of the respondents are aware that there is no unified health application while 16% do not know if there is a unified application or not (see Fig. 4).

100% of the respondents said that their company's system is linked to the electronic path of the Ministry of Hajj and Umrah (see Fig. 5).

The employees of the Hajj and Umrah companies noted that there is an intermediary system called (MAKHAAT), which is responsible for transferring information from the Ministry of Hajj and Umrah to the Hajj companies. This information is collected online, while the pilgrim registers through the Ministry's Hajj and Umrah website. Secondly, users are required to select from a list of Hajj companies the one that is providing their Hajj services. Third, it is required to fill in personal and health information, and finally, the pilgrim's data is transferred electronically from the Ministry of Hajj and Umrah website to the

Does your institution provide logistical services in terms of transporting patients to and from hospitals, following them up, and completing medical care procedures

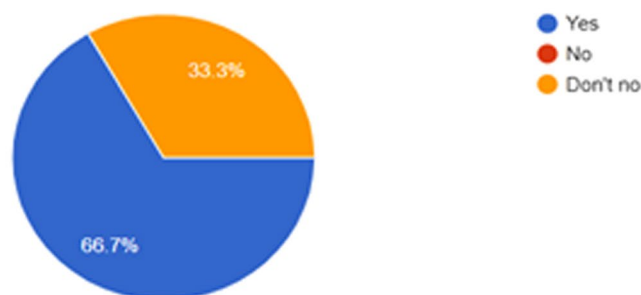
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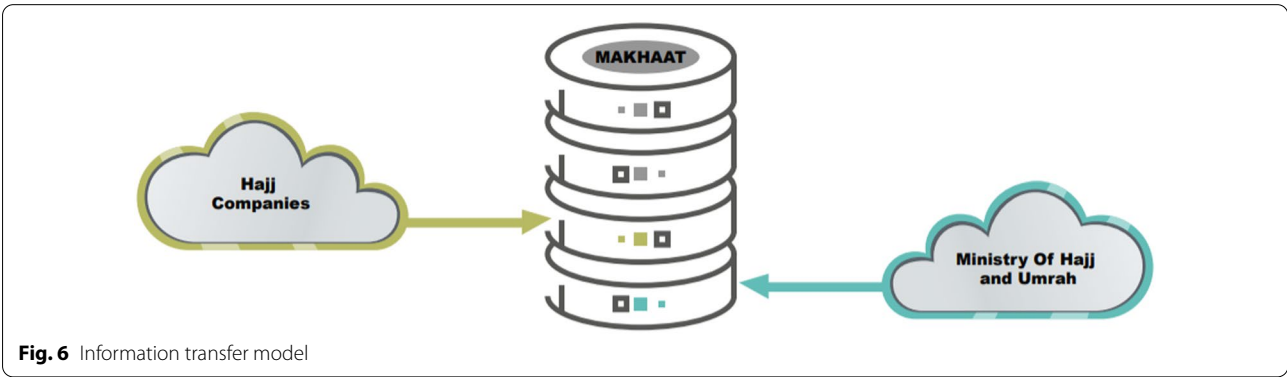
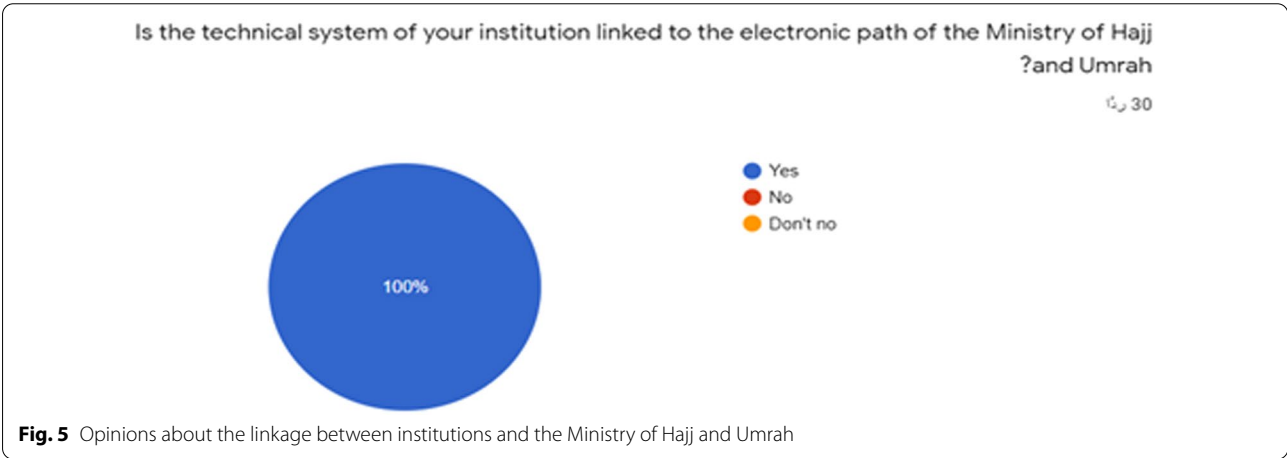
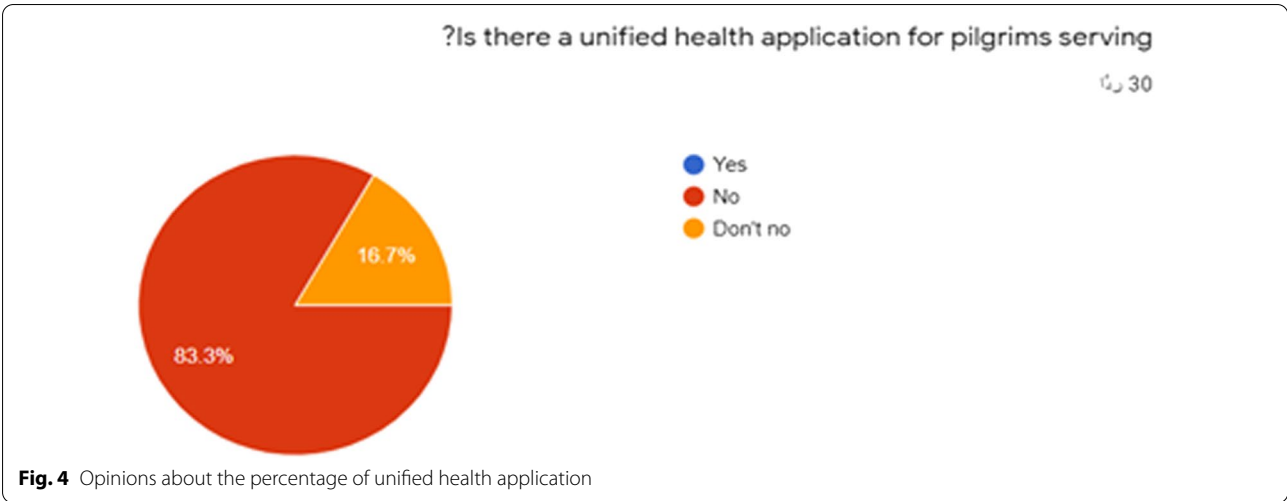
**Fig. 2** Opinions about the provision of logistical services

Do you think it is time to automate health systems and link them electronically to all concerned authorities and facilitate the sending and receiving of information

30



**Fig. 3** Opinions about the automation of health systems



registered company via (MAKHAAT); it is important to note that the Ministry of Health does not access what is called (MAKHAAT) as shown in Fig. 6. There is currently no unified electronic system linking Hajj companies with the health sector and the procedure.

The interview was conducted with the representative of the Ministry of Communications and Information Technology about digital transformation and automation through link government agencies with the Hajj and Umrah sector electronically. Eight strategies have



been suggested as a result of this interview, these are: safe and stable homeland, distinguished government performance, diversified and sustainable economy, and pioneering service for pilgrims, obtaining transparency, preserving data privacy, effectively linking them to a strong database, and building an advanced digital society.

## Discussion

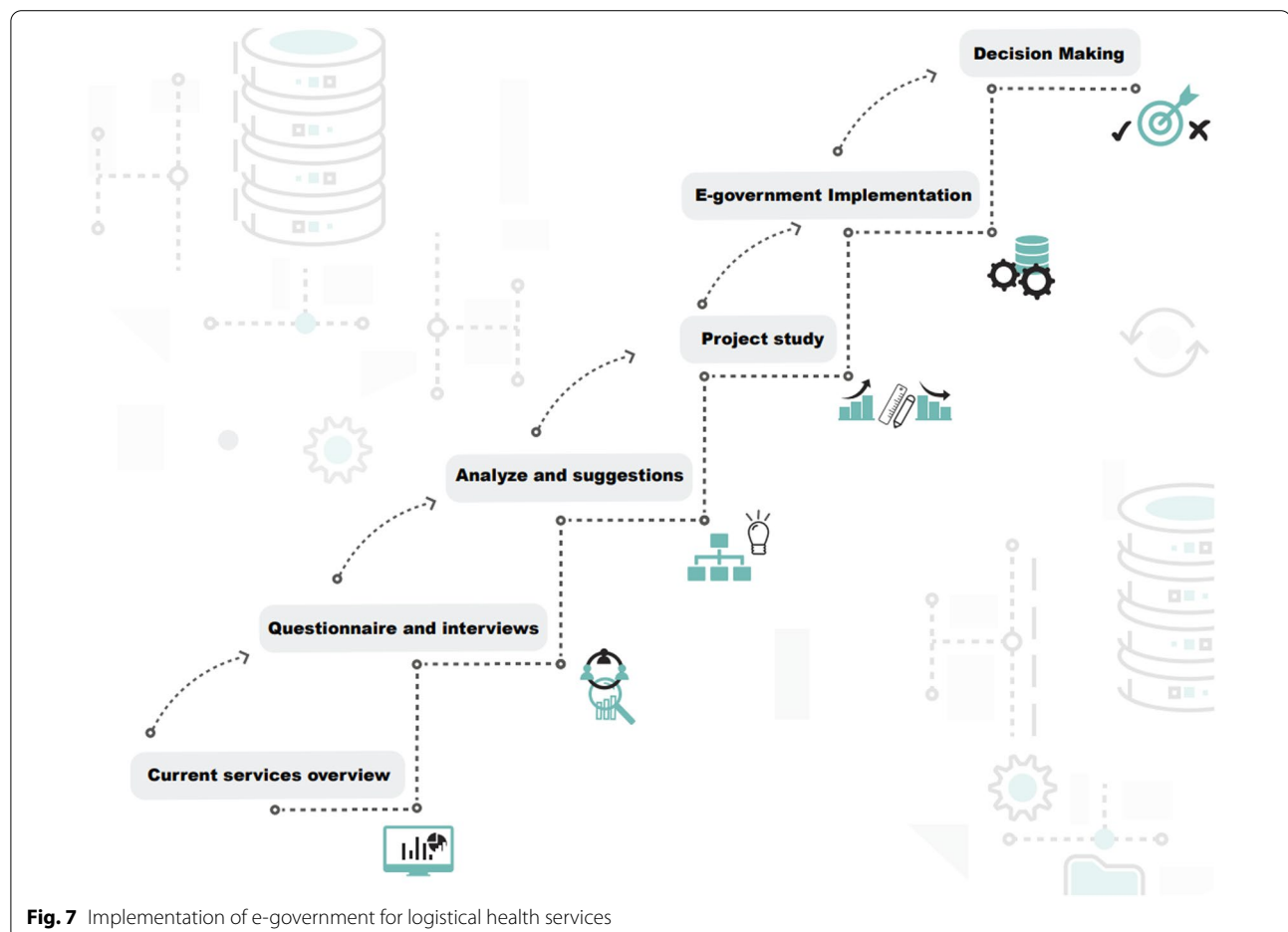
While there are a number of entities and applications that can facilitate the logistics of the health and safety of Hajj pilgrims, they are fragmented and therefore lack efficacy. The lack of a unified electronic platform to maintain the pilgrim's health services needs to be addressed. It is suggested to increase pilgrim awareness about disease prevention by integrating healthcare services in one single portal (Salem et al. 2019). Furthermore, annual reviews should be planned for forthcoming hajj seasons to summarize performance and ensure the quality of logistic health services, as well as to assist pilgrims in finding urgent medical assistance (Almuzaini et al. 2021; Shirah et al. 2017). The benefits of using a unified medical

database are increased improving decision-making, following up on pilgrims' behavior, and reach their satisfaction (2019). This can be accomplished by following the steps which are presented in Fig. 7.

They must be integrated into a unified, distinct, and innovative electronic platform between the concerned parties to enhance the satisfaction of pilgrims and provide high-quality services.

## The importance of applying the logistics health services in Hajj

Due to an increase in the annual number of pilgrims, the government of the Kingdom of Saudi Arabia and Hajj service companies are making a significant effort to develop the Hajj, keeping up with annual growth, improving quality, develop and improving logistics health services, and speeding up services are critical (Ministry of Hajj and Umrah 2021). The Kingdom supports the health care system for pilgrims by equipping hospitals and health care centers. The Ministry of Hajj and Umrah has strategic



measures aimed at improving the Hajj and Umrah sector, the most prominent of which are the following:

- Creating an Electronic Control and Monitoring Center in the Ministry of Hajj and Umrah with the aim of linking pilgrim service centers with decision-makers, increasing cooperation between Hajj and Umrah system parties, and making the control panel access to all government agencies.
- The electronic bracelet project with the goal of assisting pilgrims and providing appropriate support, as well as making all electronic bracelet information and data accessible to all government agencies involved in the Hajj and Umrah systems (Ministry of Hajj and Umrah 2021), by using RFIDs to track pilgrims and monitoring their health status to reach them quickly and assist them (Osman and Shaout 2014).

Establishing a common and unified electronic platform for logistical health services between the Ministry of Hajj and the Ministry of Health in addition to the Hajj companies that provide logistical health services and supervised by the Ministry of Hajj to ensure the provision of high-quality services by adopting advanced and modern applications of logistical health services and providing the necessary funding for them (إ. ي. ر. 2017). A unified system will reduce human effort and the need for additional applications. This will provide a better solution for the health care of pilgrims and serve them with higher quality. It will also serve to improve the infrastructure and transform to a technical community that reflects the pilgrim experience and increases his satisfaction (Sarhan 2019).

## Conclusions

The Kingdom's 2030 vision, which has a strong focus on digital transformation, is reflected in the Ministry of Hajj and Umrah and other sectors, which aim to transform the provision of services on a high and integrated level, through healthy and innovative environments that continuously support healthcare services. E-government has a positive and significant impact on citizens' service satisfaction. Moreover, it has impact on citizens' loyalty, reliability, and accountability in terms of citizen support. Currently, government agencies and pilgrims have several large unorganized databases that lack electronic links. Data suggest that this is limiting the efficacy and effectiveness of providing for the Hajj pilgrims health and safety. Based on the

data results, we recommend creating an integrated platform that links the relevant data applications on a single database in an organized manner. This could provide easy, fast, and real-time access to any information and services used by the parties concerned, which will lead to increased service performance and improved decision-making.

## Appendix A

### Interview questions

With employees of Hajj and Umrah companies:

- With employees of Hajj and Umrah companies:
  1. How does the association between health applications work in Hajj and how do they affect the enhancement of health services?
- With a health sector employee:
  1. What the required procedures are to ensure following the right steps while taking care of sick pilgrims?

### Questionnaire

1. Does your institution provide logistical services in terms of transporting patients to and from hospitals, following them up and completing medical care procedures?
  - Yes
  - No
  - Don't Know
2. Do you think it is time to automate health system and link them electronically to all concerned authorities and facilitate the sending and receiving of information?
  - Yes
  - No
  - Don't Know
3. Is there a unified health application for pilgrims serving?
  - Yes
  - No
  - Don't Know

**Abbreviation**

HIS: The Health Information System.

**Acknowledgments**

We would like to thank the Ministry of Health and the Ministry of Hajj in Saudi Arabia for their support for this paper, as well as all the staff in the Hajj companies for their assistance with the data collection.

**Author contributions**

AA and SN contributed to the writing and preparation of the original draft, methodology, and analysis results. MK and OA have supervised the whole process. All authors have read and approved the manuscript.

**Funding**

No funding was received for this study.

**Availability of data and materials**

All data are available in Appendix A.

**Declarations****Ethics approval and consent to participate**

Not required in our paper (Not applicable).

**Consent for publication**

Not applicable.

**Competing interests**

The authors declare that they have no competing interests.

Received: 13 January 2022 Accepted: 9 April 2022

Published: 18 April 2022

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