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# How COVID has accelerated digital transformation in the Kingdom



Saudi Arabia's globally recognized response to the COVID-19 outbreak has been attributed, in part, to the digital transformation of the healthcare sector already underway as part of the Saudi Vision 2030 initiative.

Digital health technologies played a critical role in the Ministry of Health's (MOH) COVID-19 response strategy. They involved deploying technology applications and platforms to control the spread of the virus, help the population of Saudi get tested and vaccinated, educate them on self-isolation practices, and promote the efficiency and quality of health services throughout the Kingdom<sup>1</sup>.

While the Ministry of Health was making valuable progress on the digitization programs, the pandemic undoubtedly accelerated efforts. These new applications, platforms and programs are being used to further revolutionize the healthcare industry post-pandemic by transforming the delivery of healthcare and enhancing patient care for the long term.



## The power of a centralized command center

Established in 2019, the Ministry of Health's National Healthcare Command Center (NHCC) is a central hub for data and insights about Saudi's healthcare system<sup>2</sup>. It uses artificial intelligence and human intervention to make data-driven decisions and provide efficient and sustainable services.

The Command Center has been instrumental in the pandemic for the MOH and other parts of government by providing analytics, predictions and recommendations to manage capacity and demand. It monitors data about infections, tests, hospital capacity and availability of critical services, such as functional and non-functional ventilators. This means that the MOH can — and has — make life-saving decisions quickly to mitigate the impact of the pandemic.

In the future, the Command Center will continue to help the government monitor and manage public health throughout the country, including taking identifying health issues early, taking preventive measures, making appropriate preparations to improve the health infrastructure, and mobilizing needed resources to address issues<sup>3</sup>.

1- <https://www.barrons.com/articles/moderna-covid-19-vaccine-fda-eases-restrictions-51617371005>

2- <https://www.npr.org/sections/health-shots/2020935563377/17/11/why-does-pfizers-covid-19-vaccine-need-to-be-kept-colder-than-antarctica>

3- <https://www.massdevice.com/eu-allows-pfizer-biontech-covid-19-vaccine-to-be-stored-at-higher-temperatures/>

# The deep impact of digital applications

Prior to the pandemic, the Ministry of Health was digitizing healthcare to improve the health of those living in the Kingdom, particularly with platforms and apps intended to make healthcare services more accessible.

The Seha app, which was launched before the COVID-19 outbreak, made medical consultation with doctors easier by connecting patients with medical professionals certified by the Ministry of Health across the country through virtual face-to-face appointments, text messages and audio recordings<sup>4</sup>. In addition, automatic medical advice can be provided using artificial intelligence to improve the health of the community.

Throughout 2020, over 2.1 million medical consultations were done remotely through the Seha app. This record-breaking usage contributed to raising community awareness on COVID-19 and its protective measures as well as providing accurate medical information and improving health services for citizens. For the healthcare industry, this usage resulted in a reduction of the financial burden on health facilities.

Furthermore, recent studies of the Seha app show that app users perceived greater ease of access to healthcare and felt they had a better overall health experience. Their satisfaction with healthcare services and their belief in the efficiency of the system was also higher<sup>5</sup>.



4- <https://www.barrons.com/articles/moderna-covid-19-vaccine-fda-eases-restrictions-51617371005>

5- <https://www.npr.org/sections/health-shots/2020935563377/17/11/why-does-pfizers-covid-19-vaccine-need-to-be-kept-colder-than-antarctica>



# Digital technology kept citizens healthy and safe during the pandemic

Before the pandemic, the Ministry of Health also launched the Mawid Service, which aimed to facilitate and manage medical appointments and reservations. In cooperation with hospitals, primary healthcare centers, and specialized centers, the service helped citizens immediately book, amend or cancel appointments either on a mobile app, the website by contacting the 937 call center or directly visiting the center in person.

During the pandemic, the Mawid Service launched additional services to support the Ministry of Health's COVID-19 response. This included the Tetamman app designed to provide accurate and up-to-date information about COVID-19 protocols<sup>6</sup>. It provided a self-evaluation of COVID-19 symptoms with appropriate recommendations for isolation and quarantine and identifying locations of nearby clinics that serve patients suffering from COVID-19 symptoms.

The Saudi Data and Artificial Intelligence Authority (SDAIA) also developed the Tawakkalna App to support efforts aimed at managing COVID-19. In cooperation with the Ministry of Health and all relevant authorities, the app facilitated the issuing of movement permits during the curfew period for government and private sector employees and individuals<sup>7</sup>. This helped reduce the spread of the pandemic in the Kingdom and thus mitigated the health, economic and social impacts of policies taken to protect the residents and citizens. As life in the Kingdom slowly returns to normal, the app is promoting social responsibility by offering services to notify the Ministry of Health in the event of rule violations or suspected cases.

These services have been critical to the pandemic response and ensuring quality healthcare was delivered during lockdowns. By the end of 2020, the 937-call center responded to 24.6 million calls and facilitated 7.6 million medical consultations, while the Mawid Service helped 14.3 million residents and citizens manage 67 million appointments. Due to the efficiency and cost savings, mobile health and telehealth will continue to be used post-pandemic, with telehealth estimated to reach \$415.4 million this year<sup>8</sup>.



6- <https://www.moh.gov.sa/en/eServices/Pages/Rest-assured.aspx>

7- <https://ta.sdaia.gov.sa/en/index>

8- <https://www.sme10x.com/10x-industry/government-led-digital-health-initiatives-drive-adoption-of-telehealth-in-the-uae-and-saudi-arabia>



# Enhancing medication accessibility with digital apps

In addition to COVID-19 services, accessibility of medications has been enhanced using technology. The newly launched Wasfaty Service links hospitals and primary healthcare centers to community pharmacies. For patients, this means they can obtain required medications from the nearest community pharmacy for free. By the end of last year, the Wasfaty Service linked 74 Hospitals, 1,413 primary healthcare centers, and registered 2,193 pharmacies to the system. This allowed it to issue more than 8.4 Million e-prescriptions in 2020<sup>9</sup>.

The advantages of the Wasfaty Service are great; the system prevents unauthorized repetition of prescriptions, which reduces overdoses. It flags medication and prescription conflicts for physicians and provides warnings of patients' sensitivity to prescribed medications. For the healthcare industry, the service improves spending efficiency by avoiding duplication of prescriptions and offering multiple issuances of prescriptions for patients with chronic diseases. Lastly, it facilitates engagement with

the private sector, allowing it to increase its role as per the Saudi Vision 2030 goals.

In pharmaceuticals, technology was also used to increase transparency and traceability to ensure the accessibility of medications in both major cities and more remote communities<sup>10</sup>. For example, now the drug track and trace system has more than 4,800 health facilities registered and had performed more than 1.2 billion operations on medicine bottles by the end of 2020.

To further support efficient and effective medication use, the Ministry of Health launched a version of its drug directory for smart devices. This app makes it easier for physicians, pharmacists, and nurses to verify medication doses before prescribing, dispensing, or administering them to the patients. Information is provided in an easy-to-understand manner with tutorials that are both concise and specific on topics such as medical conditions and the medications dispensed to patients.

9- <http://www.arabia-saudita.it/files/news/202106//ntp-report-2021-digital-en-1.pdf>

10- <http://www.arabia-saudita.it/files/news/202106//ntp-report-2021-digital-en-1.pdf>

# Digital applications support vaccinations

When vaccination rollouts began in the Kingdom, the digital infrastructure developed and launched by the Ministry of Health supported the inoculation efforts seamlessly.

The Sehaty app, which provides health services and tools for residents and citizens, is how individuals can book vaccinations for COVID-19. After submitting a vaccination request, applicants received a message within 48 hours confirming their specified date for receiving vaccine doses. This approach was so successful that the app received more than 150,000 registrations in the first 24 hours<sup>11</sup>.

Once vaccinated, residents and citizens are required to register on the Tawakkalna app. Registration is necessary to travel and support a return to a normal way of life for everyone in Saudi Arabia<sup>12</sup>.

## Accelerating AI in healthcare

The thorough and thoughtful application of digital technology has created a foundation for the use of more advanced applications, like artificial intelligence (AI), in the healthcare industry.

During the pandemic, the SDAIA and the Ministry of Health launched an AI-powered service called Tabaud to notify people in crowded areas of individuals who have contracted COVID-19 within the last 14 days.

As the pandemic eases, the government is funding other opportunities for AI applications. One such use case is chatbots. The Public Investment Fund recently invested alongside others in a company using natural language processing and conversational AI to automate patient intake and engagement, which reduces healthcare costs by making expert health guidance available without the need for human physicians<sup>13</sup>.

11 - <https://www.arabianbusiness.com/healthcare/456039150000--people-register-for-saudi-vaccine-programme-in-first-24-hours>

12 - <https://www.traveldailymedia.com/travellers-to-saudi-arabia-need-to-register-vaccination-status-online/>

13 - <https://www.forbes.com/sites/robtoews/202026/08//ai-will-revolutionize-healthcare-the-transformation-has-already-begun/?sh=57207dd8722f>





Post-pandemic, there are opportunities to leverage AI to integrate different COVID-19 data sources in preparation for future outbreaks<sup>14</sup>. Deep learning can also be used to provide more accurate results when physicians analyze lung diseases, like COVID-19, using CT images.

Furthermore, data collection through robust digital healthcare infrastructures, which are now available in the Kingdom, means that hospitals and facilities can utilize AI to quantify, monitor, predict and reallocate existing resources and improve their overall supply chain management. By bringing new insights through data collection, businesses are able to save time, money and make data-driven decisions<sup>15</sup>.

The dedication to digital transformation efforts in the Kingdom's healthcare sector is not only improving services for citizens, but it is also receiving recognition. Saudi Arabia was awarded the Government Leadership Award 2020 by the International Telecommunications Union last year<sup>16</sup>. In addition, Saudi Arabia moved up the United Nations e-government development index by nine spots from the previous year<sup>17</sup>. Clearly, the future of healthcare in Saudi Arabia is bright.



14- [https://www.researchgate.net/publication/343594160\\_Digital\\_response\\_during\\_COVID-19\\_Pandemic\\_in\\_Saudi\\_Arabia\\_Preprint](https://www.researchgate.net/publication/343594160_Digital_response_during_COVID-19_Pandemic_in_Saudi_Arabia_Preprint)

15- <https://www.salehiya.com/services/supply-chain-advisory/>

16- <https://www.gsma.com/newsroom/press-release/gsma-announces-winners-of-the-2020-glomo-awards/>

17- <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/149-Saudi-Arabia>



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