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An Artificial Intelligence (AI) and Digital Services at King Saud University Libraries in COVID-19 Pandemic

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ABSTRACT

This article presents the Artificial Intelligence (AI) applications and Digital Services (DS) used at King Saud University Libraries as a procedures to continue providing services during the COVID-19 pandemic, which were monitored based on the researcher's knowledge of what is being done through his observation during this pandemic as a staff member of the Deanship of Library Affairs at King Saud University, in order for the experience of King Saud University libraries to be available for researchers and interested parties to view, benefit from, develop or change what must be changed in other universities libraries As the king Saud University's Libraries continued to provide their services by employing possible artificial intelligence techniques, And by employment of digital services in the university libraries, while the Covid-19 pandemic has impeded the provision of many services which were provided in their natural form before the pandemic.

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Introduction

The COVID-19 pandemic, has led to what looks like a crisis in the whole world and to an unknown and risky future whose consequences are difficult to know, and on March 3, 2020, the first case of COVID-19 was confirmed in Saudi Arabia, which, like other worldwide countries, was forced to take the necessary measures and precautions to cope with the epidemic, closing most public and private activities. and restrictions on the movement of people across the country and therefore the pandemic is a reason to find a way to stay away from pollution, so it is necessary to choose a remote working method as an urgent option to stay away from Infection, and from here we learn lessons for the future towards facing crises, dealing with them and mitigating their effects as much as possible in all walks of life, and working on the readiness of educational institutions and information institutions to implement distance education in conjunction with traditional education in normal circumstances to ensure the readiness of the educational system to operate efficiently when needed, and because of the impacts of COVID-19 in the education, and because the distance education students need up-to-date information resources to support their learning, the role of academic libraries in readiness is no less important than the role of universities and schools, just as society members in general need to access information in all their affairs, especially when access to schools, universities and workplaces is suspended and homes are needed [1]. They were directed to work and study remotely, here emerges people's need for information, and the role of the information specialist comes in providing information and accessing its containers electronically or through delivery services [2]. King Saud University libraries

have gone through the experience and were able to deal with it at an appropriate level depending on the technical readiness that preceded and accompanied the emergence of the COVID-19 pandemic, and the situation was affected. The social network globally due to (COVID-19) pandemic and everyone is making efforts to resilience in the COVID-19 pandemic as much as possible [3]. This study hi light on the applications of artificial intelligence and digital services that the Deanship of Library Affairs at King Saud University was able to continue providing its services to beneficiaries at a time of the outbreak of the COVID-19 pandemic.

Scope of the Article

This article reflects Artificial Intelligence (AI) applications and Digital Services (DS) used at King Saud University libraries during COVID-19 pandemic.

Methodology

The case study method was used in this study based on the researcher's knowledge through his work at the Deanship of Library Affairs at King Saud University, by monitoring the measures they took to can be able to provide their services during COVID-19 pandemic.

In addition, the researcher did a quick review literature through the databases of Scopus, Saudi Digital Library and Google Scholar, to find the most related studies to the subject of this study to learn about the best practices and methods that were used to provide information services in libraries during the COVID-19 pandemic.

Literature Review

In the midst of the global pandemic, the digital transformation has

increased so that we can fight COVID-19. The potential for digital and emerging technologies such as artificial intelligence (AI) to accelerate vaccine development; identify more effective public health measures; and keep the public informed about scientific information has been revealed. These applications enabled us to continue most of our lives online, and maintaining supply chains and economic and educational systems when most people stayed at home and helped us stay in touch with each other [4].

Information services and the availability of resources in university libraries in light of the precautionary measures to confront, COVID-19 pandemic worldwide, in various situations, you need to find alternative methods capable of enabling university libraries to provide their services and provide access to library resources in an appropriate manner in light of the emerging Corona pandemic, COVID-19. These libraries are working to increase their electronic services and provide digital information resources remotely to meet the needs of the beneficiaries of information resources, given the need to abandon traditional methods during the outbreak of the pandemic, and the shift in university library services to new methods and ways to enable them to continue the service in an acceptable and safe manner during the Corona pandemic]5]. This is because academic libraries around the world face difficult decisions that they must make regarding the departments whose services may be affected by the pandemic and how they can carry out their duties with the preventive precautions as defined by the rules of the Saudi CDC for Health (CDC) of washing hands well, maintaining social distancing, wearing a mask and measuring temperature [6].

The International Federation of Libraries (IFLA) has been keen to urge libraries to continue providing services during the new Corona pandemic COVID-19 [2]. The libraries of King Saud University, thanks to their good technical structure, the information resources they possess, and the information databases they share, have been able to develop working mechanisms for more information. After where I was able to continue to serve and operate effectively despite the COVID-19 pandemic.

This fast-spreading virus changed the tradition way of working to online because of all activities are shut down and since university libraries closed their doors to their headquarters visitors and temporarily suspended access to printed information resources for beneficiaries due to the pandemic conditions [5]. King Saud University libraries have replaced that by providing service and making information resources digitally available via the Internet, King Saud University libraries thanks to their good technical structure are in a Good in terms of its readiness to provide service to beneficiaries in light of the pandemic, and providing access to remote information resources via the Internet, and this is what helped it to continue its work and support the educational process and scientific research in the meantime. Since the university's libraries closed their doors to visitors to their headquarters and temporarily suspended access to printed information resources for the beneficiaries due to the epidemiological conditions, King Saud University libraries have replaced that by providing service and making information resources digitally available via the Internet, King Saud University libraries thanks to their good technical structure are in a good position in terms of their readiness. To provide service to beneficiaries in light of the epidemic and to provide access to remote resources of information via the Internet, and this is what helped it to continue its work and support. The educational process and scientific research in the meantime. The COVID-19 pandemic has clearly accelerated the digital transformation of library services [6]. The university

libraries also continued to provide access to printed information resources without contact, and through precautionary measures, which consisted in booking an appointment to visit the library, allowing to arrive in the allotted time without the presence of other beneficiaries at the same time, and after taking a measure of his body temperature, he can access and review the printed resources. And he took what he needed from the resources and self-employed the borrowing process through the self-service machine, then he left the library, In any case, most of universities libraries in the world were able to provide one or more services remotely during the pandemic [7]. While many university libraries suffer from the digital divide, lack of digital literacy skills in the digital environment and perhaps the slow speed of the Internet, that prevented their transition to online and that is resulting in less use of library resources during the pandemic [8]. University libraries in King Saud University continued to provide access to printed information resources and lend them without contact, and through precautionary measures, which consisted in booking an appointment to visit the library, allowing it to arrive on time without the presence of other beneficiaries at the same time, and after measuring his level of freedom, he was able to access. Go to and read the printed sources. He took what he needed from the resources and worked for his own account in the borrowing process through the self-service machine, and then left the library.

The same is the case when returning the borrowed book, where an appointment is booked and the beneficiary comes at the date and goes through the same precautionary measures, then he goes to the self-borrowing device and makes a return of the book and puts it in the designated place and then leaves. The same applies when returning the borrowed book, where an appointment is reserved and the beneficiary attends the date and is subject to the same precautionary measures, and then he goes to the self-borrowing device and returns the book and puts it. In the designated space and then leave. At the end of the day, the concerned staff collects the resources of the returned information after taking all precautionary measures, including wearing sleeves and gloves, and returning those resources to the library.

At the end of the day, the concerned staff collects the resources of information returned after taking all precautionary measures, including wearing sleeves and gloves, and returning those resources to the library, and that's why the Librarians feeling that they are well-positioned and ready to the emergency and thy ready to support remote research, teaching and learning [9]. Because the beneficiaries were unable to reach the Central Library due to the precautionary measures to confront the epidemic, university libraries around the world had to take that procedure so the loan policy was also amended and the delay in returning borrowed information resources was overlooked at the time of arrival to the library, and the due dates for returning borrowed materials were extended, and because the beneficiaries were unable to reach the library headquarters due to the precautionary measures to confront the epidemic, the lending policy was also modified and the delay in returning borrowed information resources at the time of arrival to the library and their due dates was overlooked. Return of borrowed items has been extended [8].

It is clear that any decision to restrict services or close libraries is a difficult one and must be taken after Risk assessment and because of that the use of printed collections was suspended and replaced with digital collections as a safe alternative at the time of preventing access to the library headquarters at the beginning of the outbreak of the epidemic, then access to them resumed according to precautionary measures and through the appointment

booking service via the Internet and the library application [9]. The use of printed collections was suspended and replaced by digital collections as a safe alternative at the time of preventing access to the library headquarters at the beginning of the outbreak of the epidemic, and then access to them was resumed according to precautionary measures and by booking appointments online service and the library application.

In view of the many developments in the new Corona pandemic and the outbreaks and pivoting waves of the virus that have occurred, it is not clear until now, how long the Covid-19 virus will remain, and the instructions may continue to the necessity to maintain all precautionary measures and to emphasize taking new precautions for the safety of the individual and society in Saudi Arabia and in all Countries of the world. In light of the many developments in the new Corona pandemic and the outbreak and pivotal waves of the virus that has occurred, it is not clear until now how long the Covid-19 virus will remain, and instructions may continue to the necessity to maintain all precautionary measures and to emphasize taking new precautions for the safety of the individual and society in the Kingdom of Saudi Arabia and in all countries of the world.

It is expected that working with distance education and maintaining transactions in a digital environment will continue. Therefore, King Saud University libraries will have to continue providing and developing their electronic services and adding as many new services as possible to meet the needs of beneficiaries remotely [10]. It is expected to continue working with distance education and maintaining transactions in a digital environment. Therefore, King Saud University libraries will have to continue providing and developing their electronic services and adding as many new services as possible to meet the needs of remote beneficiaries, as Continued provision of Borrow books and return services without delay fines, with electronic renewal of Borrowing books [11].

Results Discussion
How did King Saud University libraries provide services during the pandemic:
During the status of the current situation of the outbreak of the new Corona pandemic (COVID-19), the urgent need to keep safe the staff and beneficiaries of the libraries of King Saud University and this necessitated the work of a precautionary plan from the Deanship of Library Affairs through which prevention and safety measures are applied and the mechanism of action followed during the pandemic The same way many universities dealt with in the world, There are important guidelines to consider in managing the safety of staff and library visitors: separate entrance, physical spacing maintaining a distance of at least one and a half meters between people, rearranging furniture and computer facilities, determine the distance between visitors and key service points, reduce face-to-face interaction [12].

The following is an explanation of the steps that are followed to apply the precautionary measures to limit the spread of the emerging corona virus (COVID-19) in the libraries of King Saud University which in a number corresponds to what has been taken in other international university libraries it also complies with the recommendations of the Riyadh Global Digital Health Summit of measures to act at the time of the COVID-19 outbreak [13-15]:
- Thoroughly clean and disinfect all vital areas, surfaces, and Mutual tools.
- Determine the gate that will be used for the entry and exit of

staff and beneficiaries.
- Providing a suitable place to isolate the books that are returned by the beneficiaries.
- Redistributing and organizing furniture and equipment to ensure physical spacing (a distance of not less than one and a half to two meters) and the use of spacers wherever possible.
- The use of floor stickers to indicate the safe distance to be left between people in lines and elevators.
- Providing hand sanitizers in all parts of the library, especially near service points.
- Putting up signs for (instructions for safe spacing and distance, hygiene requirements and safety measures, not to use public toilets).

Dealing with the beneficiaries [13].
- Only beneficiaries who have urgent cases to review university libraries, such as clearing a party or the like, are allowed to enter the library, and thy shod book appointment to visit the library.
- Measuring the temperature of all beneficiaries at the entrance gate and not allowing anyone whose temperature exceeds (38) degrees Celsius to enter.
- To oblige the beneficiaries to sterilize their hands, wear masks or cover the nose and mouth, and take into account the safe distance to sit or stand between them (one and a half to two meters).
- It is allowed to provide the service to 20 beneficiaries in the library at one time; Provided that the duration of stay in the library for one visit does not exceed one help for each beneficiary.
- Beneficiaries are received on the ground floor of the library only, with the entry and exit process of the library organized separately for each beneficiary.

Dealing with books [13].
- Returned books are isolated in the place designated for them for a period of four to five days before they are returned to the shelves.
- Staff are required to wear masks and gloves while receiving books from the beneficiaries and transporting them to the designated place.
- In the event that the book needs to be sterilized using a sterile material, it must be taken into account not to damage the book cover and leave it for two minutes before using it.

Results
During the status of the current situation of the outbreak of the new Corona pandemic (COVID-19), the urgent need to preserve the safety of King Saud University Libraries staff and beneficiaries has necessitated a precautionary plan by the Deanship of Library Affairs through which prevention and safety measures are applied and the mechanism of action followed during the pandemic, As can be seen in the following results:
- The study showed that the Deanship of Library Affairs and its libraries did not face much trouble to continuing and provide service to beneficiaries during the pandemic because of the available good infrastructure.
- The study also showed that the digital databases that the university subscribes via Saudi Digital Library was a suitable alternative for the continued access of researchers from faculty members, students and researchers to the information resources they need https://sdl.edu.sa/sdlportal/en/publishers. aspx.

Figure 1: Saudi Digital Library interface

• The study also showed that the Deanship of Library Affairs adopted the method of booking an appointment before visiting the library with the aim of achieving divergence and controlling the number of people present in the library simultaneously, as the library allowed one visit every quarter of an hour, with a maximum of 60 visits per day, and you can book your visit from this link: https://mlibrary.youcanbook.me/.
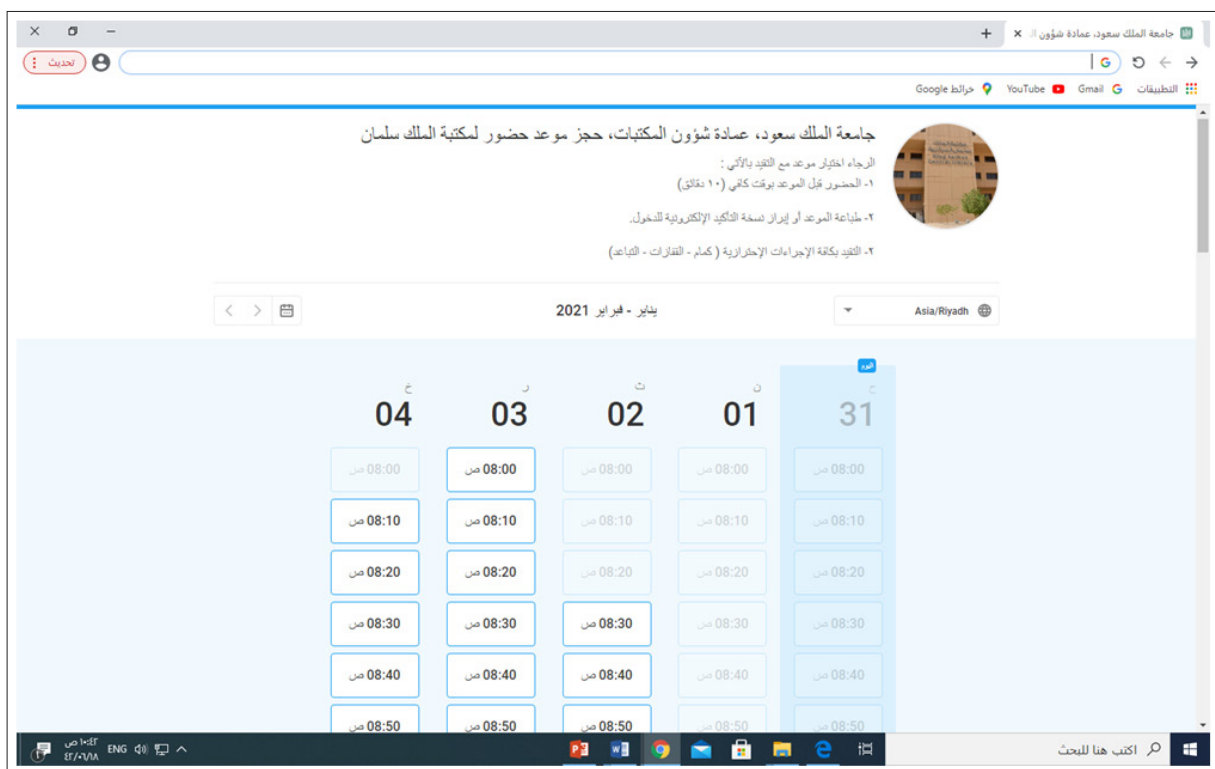

Figure 2: booking an appointment page

• The study also showed the commitment of the Security and Safety Department at the university to ensure that visitors adhere to health precautions before entering the library from wearing a muzzle and checking the temperature.
• The study also showed that the library's application for smart devices facilitated the process of communicating with the beneficiaries, as the average number of contact and service times [12]. https://library.ksu.edu.sa/ar/node/2075.
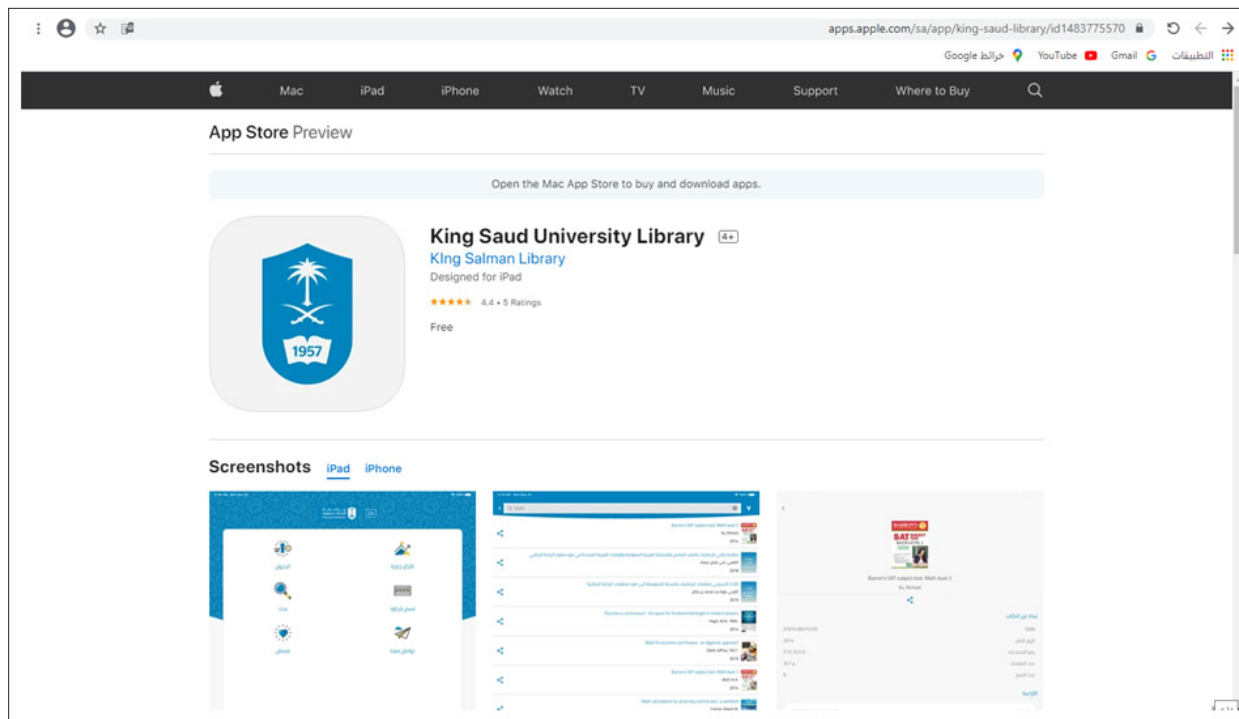
Figure 3: library's application page

• The study showed that the application of live chat and chatbot contributed to increasing the response to inquiries and requests of beneficiaries remotely.
• The study showed that the Deanship provided a WhatsApp service to receive suggestions, questions and requests as another option to intensify the methods of serving beneficiaries during the pandemic from a distance, through the following link: https://api.whatsapp.com/send?phone=966118061000.
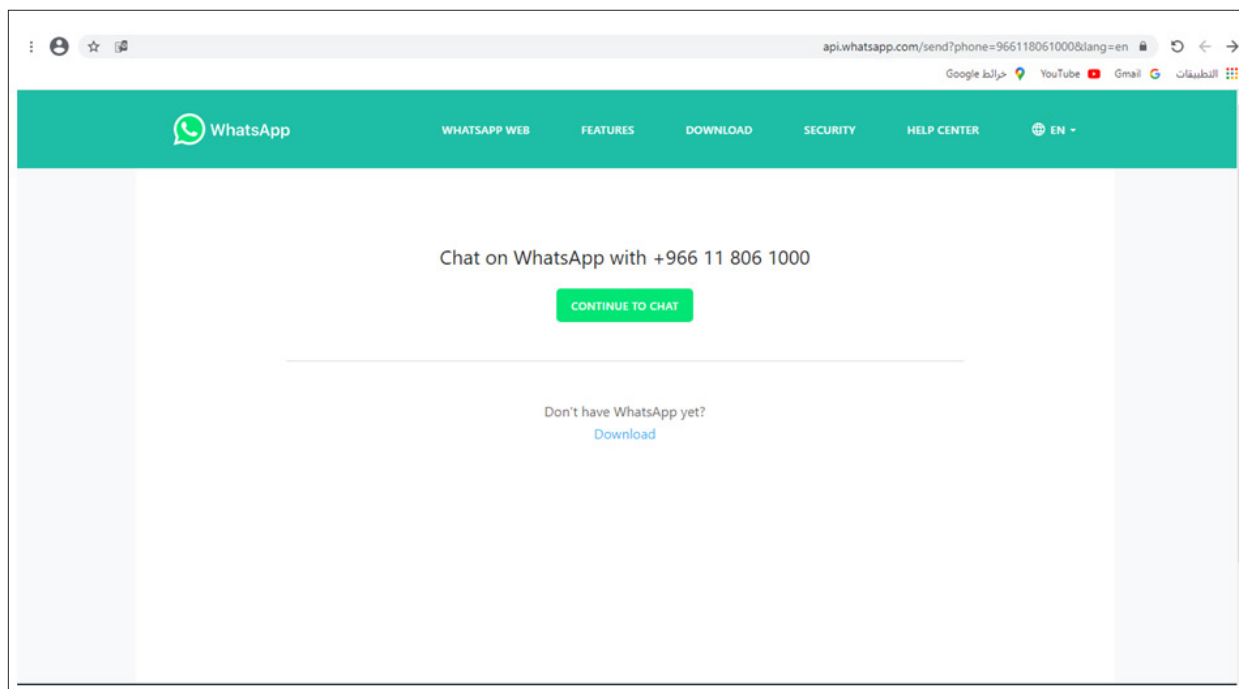

Figure 4: Library WhatsApp service page

This table below showing the volume of use of artificial intelligence and digital services for beneficiaries in the King Salman Central Library for Students and the Princess Sarah Central Library for Female Students during the year in which the pandemic occurred 2020.

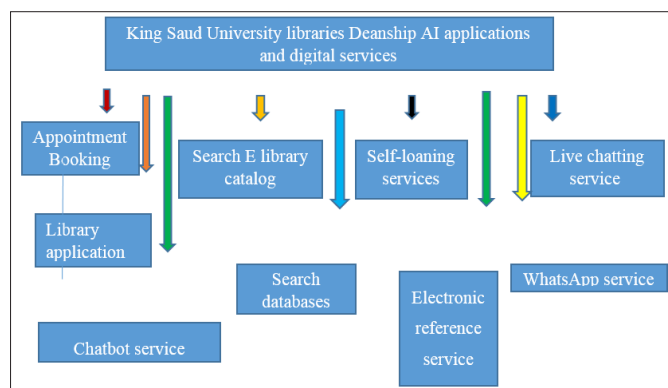**Table 1: Artificial Intelligence Applications and Digital Services in King Saud University Libraries**

Service	Statement	Frequency or percent
Call Center	King Salman Central Library and Princess Sarah Central Library	1875
Electronic reference service	Requests submitted	2800
	Requests accepted	2581
	Denied requests	219
	Number of inquiries	329
	Number of beneficiaries' activation requests	282
	Number of inactive	28
Live chat service	The number of conversations	7406
	Number of Visitors	4755
	Average response time	82 seconds
	percentage of beneficiaries' satisfaction	89%
Chatbot service	Available and inactive	Not activated
WhatsApp service	The number of outgoing messages	15334
	The number of messages received	15390
	The number of beneficiaries	1300

Table 1 taken from: Library Deanship Affairs (2020) Annual report. King Saud University. Printed version (in Arabic) 42.

This table shows the Frequency or percent of times digital services and AI applications have been used in The King Saud University libraries during the period of dealing with the COVID-19 epidemic.

Integration has been made with the admission, registration and student affairs systems, and deanship of human resources, so the student and staff can now disclaimer from the library without coming to Library or communicating with it, but it is sufficient that the evacuation of the party be accepted through the electronic portal, which gives him the acceptance of the request in case he was not registered in his custody of borrowed materials in Automated library system.

AI applications and digital services that helped King Saud University libraries cope with the impact of the new CORONA pandemic COVID-19


Figure 5: This figure presents the digital services and applications of artificial intelligence in the King Saud University libraries

Download Applications to Enter King Saud University Facilities. The artificial intelligence applications approved by Ministry of Health in Saudi (Tawakklna application and Tabaud application), which King Saud University requires that the staff and beneficiaries of its services upload to their smart devices, monitors the extent of adherence to the precautionary measures while accessing the services provided within the university through tracking using the user's address on the Internet (IP), this is useful in limiting to spread of the epidemic, and if the user is infected with the emerging coronavirus (COVID-19) or is in contact with an infected one, so it will be very easy to track it and prevent the spread of the virus. And this contributes to the maintenance and continuity of surveillance systems as an essential component of the global health system related to rapid preparedness and optimal global responses [8].

• Instant chat robots performed very useful services, through which the beneficiaries were able to ask questions and obtain responses throughout the working hours continuously, and often outside the working hours, and this helped in the continuation of communication between the beneficiaries and the information services in the university libraries. The website interface of the Deanship of Library Affairs is available on the Internet, instant messaging service and robot chatting around the clock, seven days a week, through the following link: https://library.ksu.edu.sa/en.
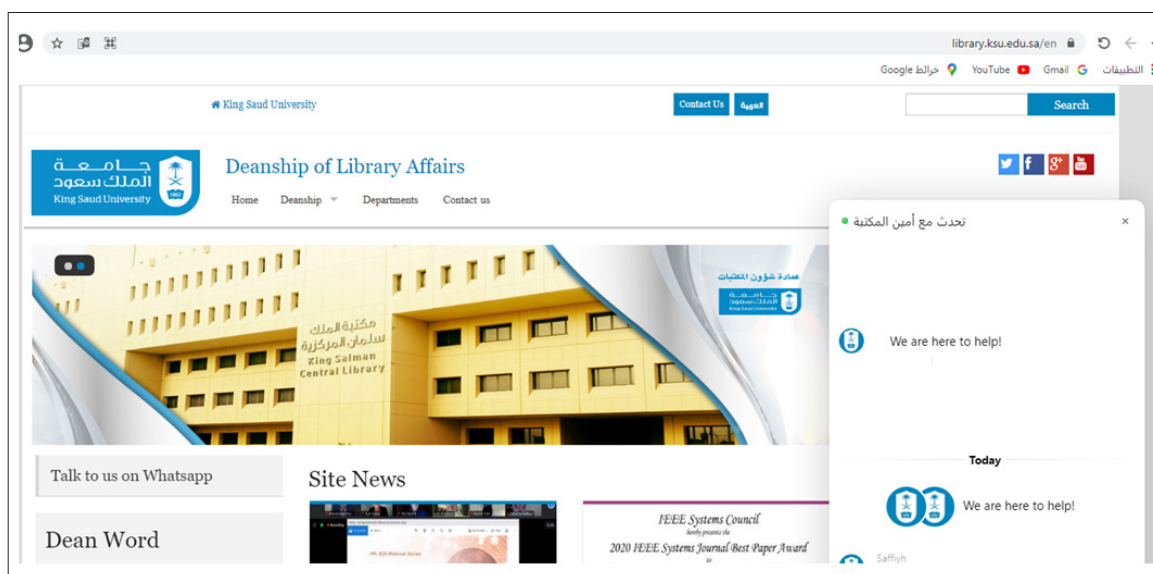
Physical proximity is seen as one of the primary ways infection spreads, and social distancing is a good way to reduce the risk of infection spreading. In light of this reality, libraries at King Saud University use the application of spacing that works with artificial intelligence to avoid the epidemic and the spread of infection during the presence of visitors or the performance of the staff of the service and to prevent the opportunity for staff to communicate directly with the beneficiaries to preserve their health and reduce the chances of infection spreading.

Conclusion
This study aimed to identify the applications of artificial intelligence and digital information services that enabled King Saud University libraries to continue work and provide information services to beneficiaries during the outbreak of the new Corona epidemic, COVID-19.

Making information resources available to the beneficiaries. We have discussed in this study the applications and services used by the libraries of the Deanship of Library Affairs at King Saud University to introduce them and share this experience with everyone to benefit from it in other university libraries. The discussion was mainly on the topic of artificial intelligence applications, used in the service of beneficiaries or in monitoring the state of the health situation and adhering to the precautionary measures by artificial intelligence applications, smart chatbots, assistance robots, and artificial intelligence alarms, to counter the effects of the Corona virus epidemic and continue to work and provide Services in a Pandemic.

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