A Multilingual Audio Computer Application for Learning Muslim Prayer for Individuals with Visual Impairments

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Abstract

In the Holy Qur'an, Allah conveys the obligation of prayer through the Prophet Muhammad (peace and blessings be upon him). Prayer is a fundamental act of worship required of all Muslims, male and female, five times a day. It establishes a direct connection with Allah and fosters a sense of closeness to the Creator. Additionally, prayer helps Muslims organize their time, offering periodic mental and physical rejuvenation. For individuals with visual impairments, learning prayer poses unique challenges due to the lack of visual cues traditionally used in instruction. This research aims to assist individuals with visual impairments in learning and performing Muslim prayer through a computer application designed to offer guidance in multiple languages, including Arabic, Kurdish, English, and Turkish. The proposed application provides audio-based instructions in these languages, ensuring accessibility while maintaining the recitation of the Holy Qur'an in Arabic during prayer. The application features a user-friendly interface, making it easy for users to navigate and engage with the learning process. In addition to teaching prayer, the app also includes guidance on performing Alwudu' (the ablution ritual before prayer) and offers prayer time reminders. The application is designed for further enhancement by adding more languages in the future. The application expanded its accessibility and usability especially when it is integrated with artificial intelligence applications.

Keywords: Multilingual Prayer Application, Prayer Learning, Audio-Based Prayer Guidance, Visual Impairments.

1. Introduction

Blindness is a disorder characterized by the partial or complete loss of vision. Generally, blindness is caused by different causes, such as genetic factors, injuries to the eyes or brain, illnesses such as glaucoma or cataracts, infections, age-related conditions, or neurological disorders (Lavric et al., 2024; Manirajee et al., 2024; Al Shehri W. et al., 2022).

The Muslim prayer is one of the most important acts of worship in Islam, and it is the second pillar of the five pillars of Islam. Prayer serves as a direct means of communication between a person and their Creator, performed five times a day at specific times: dawn (Fajr), noon (Dhuhr), afternoon (Asr), sunset (Maghrib), and night (Isha). Prayer unifies Muslims worldwide, as it is performed in the same manner and with the same words taught by the Prophet Muhammad (peace be upon him). In addition to its spiritual significance, prayer

reflects discipline, commitment, and physical and spiritual purity, helping to foster a sense of inner peace and harmony with Allah and others (شمس الدين ابن القيم, 691).

The five daily prayers in Islam are based on divine guidance and a religious obligation found in the Qur'an and the teachings of the Prophet Muhammad (peace be upon him). According to Islamic belief, the five prayers were made obligatory during the Prophet's night journey and ascension (Isra and Mi'raj), when he ascended to the heavens. Initially, fifty prayers were prescribed each day, but after the Prophet's repeated supplication, the number was reduced to five, with the reward remaining equivalent to fifty prayers (شمس الدين ابن القيم, 691).

The five prayers are spread throughout different times of the day, helping Muslims stay connected to Allah at all times—whether during quiet moments like at dawn, or in the midst of daily activities during noon and afternoon, or at the end of the day during sunset and night. These prayers reinforce spiritual awareness and serve as a constant reminder of Allah's presence and the significance of worship in a Muslim's life (شمس الدين ابن القيم, 691).

The main construction of this work is:
- Spreading Islam and learning Muslim prayer in the world.
- Explain the Muslim prayer to the others.
- Learn to pray especially for non-Arab Muslims and facilitate the performance of prayer with a multilingual computer application.
- Help individuals with visual impairments to perform Muslim prayer using a computer application in real-time.

The remainder of this article is structured as follows: section 2 explains the importance of Muslim prayer and its time organizing, section 3 explains visual impairment applications, section 4 explains the proposed multilingual audio computer application for learning Muslim prayer for individuals with visual impairments, section 5 explains discussing the challenges of Muslim prayer and the importance of the proposed application, and finally section 6 gives the conclusion and future works.

2. The Importance of Muslim Prayer and its Time Organizing

Prayer holds a significant place in Islam and is considered one of the most important acts of worship. Learning people to pray is important and with online applications distance learning will provide flexible access, enabling learners to learn anytime and anywhere, and it makes learning accessible to a wider audience (Ahmed Abd Aoun, 2017; Alyaa A. Mahdi, 2020; Amini et al., 2024).

Below are the key aspects of prayer importance (شمس الدين ابن القيم, 691):

1. **A direct connection with Allah**: Prayer is the primary means through which a Muslim communicates with their Lord, strengthening the spiritual bond and bringing a sense of closeness to Allah.
2. **A fundamental pillar of Islam**: Prayer is the second pillar of Islam after the declaration of faith, and it is obligatory for every Muslim, male and female, and cannot be abandoned except for a valid reason.
3. **A way to avoid sins**: Prayer helps in refining the soul and steering clear of immorality and wrongdoing, as Allah says: "Indeed, prayer prohibits immorality and wrongdoing" (Al-Ankabut: 45).
4. **A source of peace and comfort**: Prayer provides a Muslim with a sense of tranquility and psychological relief, as they stand before Allah, distancing themselves from the worries of the world.

5. **A tool for time management**: Prayer teaches Muslims discipline and time management, as it is spread over specific times throughout the day, fostering a more organized and orderly character.
6. **Cleansing of the soul from sins**: Prayer purifies the soul from sins. The Prophet compared prayer to a river where one bathes five times a day, leaving no dirt behind.
7. **A path to Paradise**: Performing prayer correctly is a means of salvation on the Day of Judgment. It is the first deed a person will be held accountable for, and if it is in order, the rest of their deeds will be as well, but if it is lacking, their other deeds will suffer.

Thus, prayer is not merely a religious obligation, but it also brings profound spiritual, psychological, and ethical benefits.

The division of prayer times throughout the day ensures that a Muslim maintains regular communication with Allah. It provides moments of peace and spiritual comfort at various points during the day. This regularity also helps in organizing a Muslim's life, linking it to a natural system based on observing the sun, fostering a sense of discipline and continuity.
The prayer times in Islam are precisely and carefully distributed to ensure that Muslims maintain a continuous connection with Allah throughout the day. These times are based on the natural changes in the sun's position. Table (1) gives a deeper explanation of each prayer time, (شمس الدين ابن القيم, خالد بن محمد: 691, 2020).

Table 1. The Five Muslims Prayer Time

No.	Prayer	Prayer Start Time	Prayer End Time	Prayer Explanation
1	**Fajr prayer**	Fajr begins at the appearance of the true dawn, which is the time when daylight starts to spread horizontally in the eastern horizon, signaling the start of the day.	It ends at sunrise; the moment the sun's disk appears on the horizon.	This time marks the beginning of the day and provides a chance for a person to connect with Allah before starting their daily activities.
2	**Dhuhr prayer**	Dhuhr starts when the sun passes its zenith, meaning when it begins to decline from the middle of the sky (solar noon).	It lasts until the shadow of an object equals its length, meaning the shadow that forms after the sun passes its zenith gradually increases until it equals the object's height.	This prayer is offered in the middle of the day and provides a moment for spiritual renewal after the morning's work.
3	**Asr prayer**	Asr begins after the Dhuhr time ends, when the shadow of an object exceeds its natural length.	It continues until sunset.	Asr is offered in the late afternoon, just before evening, allowing the Muslim to prepare for the end of the day by reconnecting with Allah.
4	**Maghrib prayer**	Maghrib begins immediately at sunset, when the sun completely disappears below the horizon.	It lasts until the red twilight disappears, which is the red light visible in the sky after sunset.	Maghrib is prayed at the transition between day and night, marking the end of the day with a relatively short prayer.
5	**Isha prayer**	Isha begins after the red twilight disappear when the red light in the sky after sunset fades completely.	It lasts until midnight or until just before dawn.	Isha is the last prayer of the day, helping the Muslims conclude their day by reconnecting with Allah before sleeping.

Before Muslim prayer, people must do ablution. It makes those who maintain it and perform it frequently more deserving of the intercession of the Prophet Mohammed, may Allah bless him and his family and grant them peace, and it will be a sign by which the Prophet Mohammed, may Allah bless him and his family and grant them peace, will distinguish us on the Day of Resurrection (صحيح البخاري, 847).

On the authority of Uthman ibn Affan, may Allah be pleased with him, he said: The Messenger of Allah, may Allah bless him and grant him peace, said: "Whoever performs ablution and does it well, his sins will come out of his body until it comes out from under his nails." Narrated by Muslim (صحيح مسلم, 865).

And on his authority he said: I saw the Messenger of Allah, may Allah bless him and grant him peace, perform ablution like this ablution of mine, then he said: "Whoever performs ablution like this will be forgiven for his previous sins, and his prayer and his walk to the mosque will be voluntary." Narrated by Muslim (صحيح مسلم, 865).

On the authority of Abu Hurayrah, he said that the Messenger of Allah, may Allah bless him and grant him peace, said: "When a Muslim or believing slave performs ablution and washes his face, every sin that he saw with his eyes will leave his face with the water or with the last drop of water. When he washes his hands, every sin that his hands committed will leave his hands with the water or with the last drop of water. When he washes his feet, every sin that his feet walked upon will leave with the water or with the last drop of water." "The last drop of water, until it comes out pure from sins." Narrated by Muslim (صحيح مسلم, 865).

During prayer, Muslims must read Surah Al-Fatiha from Qur'an, (King Fahd, 1984):
Al-Fatiha is the first surah in the Qur'an, and so aptly titled Al Fatihah or the Opening, this surah was revealed in Makkah in the Kingdom of Saudi Arabia. It is said to be the first complete Surah to be revealed at once and also one of the earliest revelations, as some reports narrow it down to be the fifth revelation to the Prophet Mohammed. Needless to say, the early revelation of this surah was necessary as this complete surah is recited in every unit of the Muslim prayer, without which the prayer will be rendered invalid. As a result, another name of this surah is "As-Salah" or the prayer.

Since the surah begins with praising Allah, particularly with the words "Alhamdulillaah" (All praise be to Allah), it is also referred to as "Al Hamd". Similarly, Ad Dua'a or The Invocation is another title, since this surah ends with an invocation for guidance on the Straight Path.
In its brief composition, Surah Al Fatihah introduces Allah through qualities of mercy and lordship of the universe, while also setting the correct attitude with which a believer must approach the Book of Allah, that is to worship Him alone and to seek any help and guidance from Him only. Alone, without another, indivisible with absolute and permanent unity and distinct from all else. The one and only true deity, unique in His essence, attributes and deeds.
Also, Surah Al Ikhlas from Qur'an and its meaning to be read during prayer, (King Fahd, 1984):
Say, He is Allah, [who is] One. He who is absolute, perfect, complete, essential, self-sufficient and sufficient to meet the needs of all creation; the one eternally and constantly required and sought, depended upon by all existence and to whom all matters will ultimately return. He neither begets nor is born. Nor is there to Him any equivalent.

3. Visual Impairment Applications Support
Digital technology and software tools help individuals with visual impairments in accessing and interacting with the digital and physical world. These applications have different features

such as voice recognition and screen readers to make life more accessible for people with visual challenges (Tufel Ali Qureshi et al., 2021; Reem Jafar Ismail, 2012). Below are some categories of such applications:

1. Siri Mobile Application for Apple:
Siri is Apple's virtual assistant for iOS, macOS, tvOS and watchOS devices that uses voice recognition and is powered by artificial intelligence (AI). It is a digital assistant that uses voice commands to help users perform tasks like sending messages, making calls, or searching the Internet (apple.com, 2024).

2. JAWS Computer Application:
JAWS (Job Access with Speech) is a screen reader for Windows, developed for computer users whose vision loss prevents them from seeing screen content or navigating with a mouse. JAWS is a software program that enables visually impaired users to read the text that is displayed on the computer screen with a speech synthesizer (jaws.en.uptodown.com, 2024).

3. Envision Mobile Application
The free Envision App uses your smartphone's camera, to speak out written information, describe surroundings and objects, and even tell you who's nearby. Now powered with AI Assistant, Ask Envision, you can type or voice out any questions about both captured or imported text or images.

Excelling in all kinds of text and object recognition, Envision's award-winning OCR reads text in over 60 languages. Be it a handwritten birthday card, the ingredients listing on the back of a cereal box or even an entire book able to read text or describe images for yourself opens up limitless possibilities to participate in the activities that mean the most to you (letsenvision.com, 2024).

4. Proposed a Multilingual Audio Computer Application for Learning Muslim Prayer for Individuals with Visual and Implementation

Our research proposes A Multilingual Computer Application for Learning Muslim Prayer for Individuals with Visual Impairments. In this research, we developed an efficient application that has the following features:
- Multilingual learning of Muslim Prayer.
- Guidance on performing Muslim Prayer in multilingual learning.
- Guidance on performing Alwudu' in multilingual learning.
- Explanation and translation of Surah Al-Fatiha in multilingual learning.
- Explanation and translation of Surah Al-Ikhlas in multilingual learning.
- Prayer time reminders.
- Online computer application.

Figure (1) shows a flowchart of the methodology for the proposed application for prayer. In this application, the user needs a screen reader to help the user with visual impairments to read the application interface such as the JAWS (Job Access with Speech) computer application for Windows which is free to download and easy to use when the computer is operated or using mobile devices with voice commands such as Siri Application for iPhone, where the user has a mobile or wearable device to let them use it free during the day.
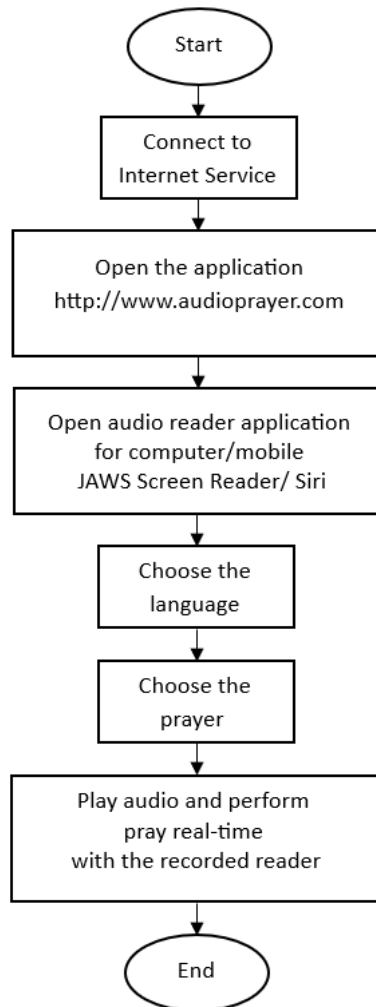
Figure 1. Methodology for Proposed Application for Prayer

In the implementation of a multilingual computer application for learning Muslim prayer for individuals with visual impairments, we use PHP, HTML, JavaScript, and CSS programming language for website design. The website supports four different languages: Arabic, Kurdish, English, and Turkish. Also, FL Studio 2024 software is used to have high-quality recording. FL Studio (known as Fruity Loops before 2003) is a digital audio workstation (DAW) developed by the Belgian company Image-Line. It is used for recording external sounds, editing audio, slicing tracks, and adding effects. In our Muslim prayer application, we use it to manually edit the recordings of Surah Al-Fatiha and Surah Al-Ikhlas, allowing us to insert a delay between each ayah (verse) to help users repeat the ayah one by one after listening to it during prayer (fl-studio, 2024).

The proposed URL will be easily navigated when shortening services are used (Reem Jafar Ismail, 2014), in the proposed system it is http://www.audioprayer.com, as shown in Figure (2).
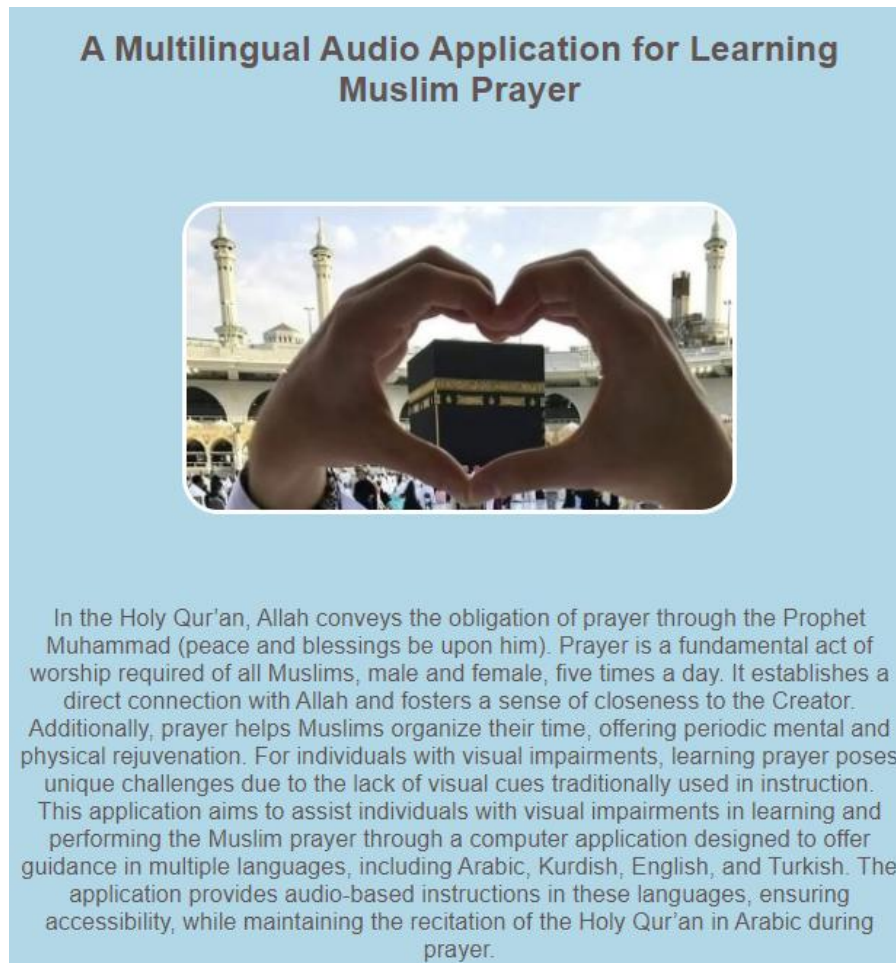
Figure 2. Home Page for Application

JAWS Application is used to assist people with visual impairments to read the text in the proposed application (jaws.en.uptodown.com, 2024).

A limitation of this application is the challenge of finding volunteers to contribute additional language translations. This is a great opportunity for anyone interested in volunteering to help translate Muslim prayers into different languages, contributing to the enhancement of the application. If you're interested, please reach out to the corresponding author at reem.jafar@cihanuniversity.edu.iq.
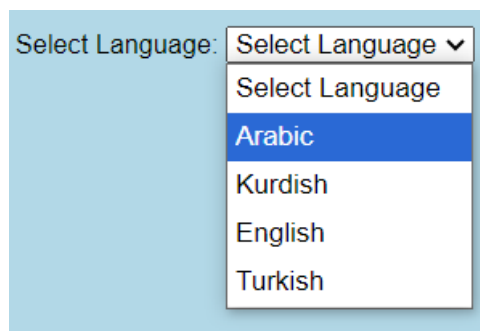

Figure 3. Select the Language

Figure 4. Explain the Muslim Prayer Interface in the Arabic Language
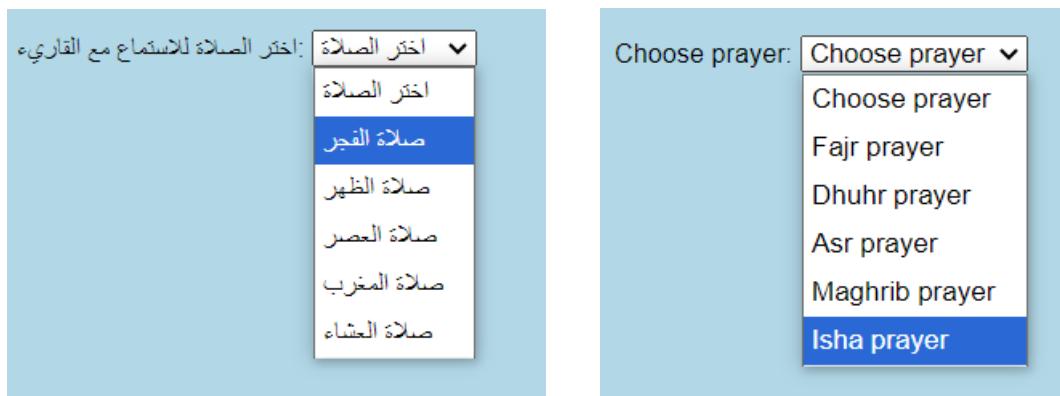

Figure 5. Arabic and English Interface to Choose Prayer

Figure (3) shows the different languages to be selected, when the Arabic language is selected the Arabic interface is shown as in Figure (4), then the pray is selected as shown in Figure (5).

5. Discussing the Challenges of Muslim Prayer and the Importance of the Proposed Application

The proposed multilingual audio computer application for learning Muslim prayer for individuals with visual impairments is helpful for all Muslima around the round who find difficulty in learning because of visual impairments in addition to any person who is willing to learn Muslim prayer and has no one to guide them. This application has a user-friendly interface since it is a multilingual and audio-based learner application. The recorded audio will make the person freely learn through day life especially busy people by listening and then practicing with the narrator.

Muslims from around the world face various challenges towards prayer, especially in the West. Prayer is a beautiful and indispensable form of worship in Islam. It serves as a regular and comforting reminder of our connection to Allah. It acts as an anchor, pulling us back for five daily prayers, regardless of our location in the world, emphasizing the obligatory nature of prayer. The following points will explain the challenges of prayer around the world and in Western Society:

Integration into Western Society
In the vibrant melting pot of the West, Muslims from diverse backgrounds to integrate their traditions into the dynamic tapestry of Western life. While this fusion is rewarding. It presents challenges, particularly in preserving the sacred practice of prayer. Muslims often seek renowned mosques for convenient access.

Public Prayer Practices
Muslims in the world often confront distinct challenges and issues related to public prayer that impact daily engagement in prayer. These challenges involve diverse elements. Such as seeking serene prayer spots. Accurately adhering to prayer times, and delicately managing privacy concerns during public prayer.

Navigating the Search for Suitable Locations for Prayer
In specific circumstances, the quest for suitable prayer spaces for salah may seem like a challenging quest. Especially in areas where Islamic centre and mosques are limited. Rendering them precious finds. Juggling professional and academic obligations while exploring fitting locations for salah in workplaces and schools can be compared to a delicate balancing act. Deftly navigating our religious duties alongside our everyday schedules.

Managing Payer Time during Busy Schedules
Striking a balance between the fast-paced demands of our lives and the consistent practice of prayer may sometimes resemble managing numerous responsibilities in a circus performance. Nonetheless, with clear priorities and efficient schedule management, we can adeptly maintain our spiritual commitments while skilfully navigating the array of tasks and responsibilities that occupy our daily lives.

Attire during Prayer
Maintaining modest attire during salah holds substantial importance in our daily activities. Achieving a delicate balance between upholding Islamic modesty and adhering to societal norms is a nuanced and contemplative process, especially for Muslims living in the West. Successfully navigating this involves harmoniously blending faith and cultural awareness in our daily lives, emphasizing that performing prayer in the workplace is an ideal means to express our beliefs

6. Conclusion and Future Works
Muslims with visual impairments face a range of challenges while performing prayer, which are related to their inability to see and the special adaptations that this requires. The proposed application will solve the challenges for blind people. Here is a summary of the most prominent challenges that blind Muslims may face during prayer and suggested solutions.

Determining the direction of the Qiblah
  Challenge: Knowing and determining the direction of the Qiblah without sight may be
  difficult for the blind, especially if they are in an unfamiliar place.

Solution: The blind can rely on assistive tools such as smart applications, asking others for the correct direction, or using spatial markers (such as placing the prayer rug in the correct direction in advance).

Navigating to the place of prayer

Challenge: Navigate safely to the place of prayer, whether in the mosque or at home, especially in crowded or unfamiliar places.

Solution: Relying on a cane, the help of friends or family, or relying on navigation technologies such as voice assistant.

Connecting with the group

Challenge: Joining the prayer rows in the group and determining the correct place to stand may be complex for the blind.

Solution: In mosques, accompanying persons or volunteers can help the blind person find his place in the row, or he can identify special places designated for blind worshippers.

Tracking the pillars of prayer

Challenge: The blind person may find it difficult to follow the movements and pillars in sync with the imam, especially if the takbirs and transitions are done quickly or in a low voice.

Solution: Focus on listening to the imam's takbirs and the audible prayer alerts, or rely on memory and repeating the prayer to recognize the sequence of the pillars.

Reading the Qur'an in prayer

Challenge: Inability to read the Qur'an visually during prayer (whether aloud or silently).

Solution: Rely on memory and memorize what is easy from the Qur'an, or use the Qur'an written in Braille, or listen to audio recordings to improve memorization.

Maintaining purity

Challenge: The blind person may face difficulty in ensuring the cleanliness and purity of the place, whether during ablution or in the place of prayer.

Solution: You can ask for help from others, check by sensory methods such as touch and smell, or make sure that the place is prepared correctly in advance.

In the future, the application could be improved by adding more languages such as Spanish. The application can be updated since the source code is available and it can be improved easily. Also, the proposed application needs to be hosted on servers to be available online.

Many visually impaired users use the proposed application and they feel more confident when they depend on themselves when praying. Also, this application helps them to pray easily and feel a sense of peace, gratitude, and relief as they communicate with Allah.

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Bio-Data

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الخلاصة: قد بين الله في القرآن الكريم وجوب الصلاة من خلال النبي محمد (صلى الله عليه وسلم) فالصلاة هي عبادة أساسية مطلوبة من جميع المسلمين، ذكورا وإناثا، وهي تؤدى خمس مرات في اليوم. إن الصلاة تقيم علاقة مباشرة مع الله وتعزز الشعور بالقرب من الخالق. بالإضافة إلى ذلك، تساعد الصلاة المسلمين على تنظيم وقتهم، مما يوفر تجديدًا عقليًا وجسديًا دوريًا أما بالنسبة للأفراد الذين يعانون من إعاقات بصرية، يشكل تعلم الصلاة تحديات فريدة بسبب نقص الإشارات البصرية المستخدمة من أجل تعلم وأداء الصلاة. يهدف هذا البحث إلى مساعدة الأفراد ذوي الإعاقة البصرية في تعلم وأداء صلاة المسلمين من خلال تطبيق حاسوبي مصمم لتقديم الإرشاد بلغات متعددة، بما في ذلك العربية والكردية والإنجليزية والتركية. ويوفر التطبيق المقترح تعليمات صوتية بهذه اللغات، مما يضمن سهولة الوصول إليها، مع الحفاظ على تلاوة القرآن الكريم باللغة العربية أثناء الصلاة. يتميز التطبيق بواجهة سهلة الاستخدام، مما يسهل على المستخدمين التنقل والتفاعل مع عملية التعلم. بالإضافة إلى تعليم الصلاة، يتضمن التطبيق أيضًا إرشادات حول كيفية الوضوء (طقوس الوضوء قبل الصلاة) ويقدم تذكيرًا بوقت الصلاة. تم تصميم التطبيق بحيث يمكن إضافة المزيد من اللغات في المستقبل، كما ويتميز التطبيق بسهولة استخدامه خاصة عندما تم دمجه مع تطبيقات الذكاء الاصطناعي.

الكلمات الجوهرية. تطبيق الصلاة متعدد اللغات، تعلم الصلاة، إرشاد الصلاة بالصوت، الإعاقات البصرية.