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iTrackah - An Innovative Solution for Accurate Tracking of Raka'ah During Muslim Prayers

Sharifah Norasikin Syed Hod, *Mea Haslina Mohd Haris, Saufianim Jana Aksah,
Noraini Ahmad and Nur Syazana Rosly

Centre of Foundation Studies, Universiti Teknologi MARA, Cawangan Selangor, Kampus
Dengkil, 43800 Dengkil, Selangor, Malaysia

*Corresponding author: mealina@uitm.edu.my

ABSTRACT

In Islamic tradition, the accurate performance of prayer rituals, particularly the tracking of raka'ah, holds immense significance. Yet, practitioners often encounter challenges in maintaining focus during prayer, resulting in errors in counting raka'ah. Existing manual counting methods or reliance on memory are prone to error and may detract from the spiritual experience. Thus, there is a pressing need for technology-driven solutions to offer accurate and accessible means of tracing raka'ah. A preliminary survey conducted for iTrackah, a novel device designed to address this need, revealed a significant demand and acceptance for such a product. Initial feedback indicates that iTrackah holds promising potential to alleviate the common challenge faced by Muslims worldwide. iTrackah is a device that leverages sensor technology to accurately monitor prostrations and translate them into the corresponding number of raka'ah completed. The device is designed to cater to the diverse needs of the Muslim community, including those with disabilities or those granted rukhsah. For users eligible for rukhsah, iTrackah intelligently recognizes the subtleties of prayer gestures to accurately determine the number of raka'ah performed. Moreover, iTrackah offers features to assist users in case of forgetting the number of raka'ah during prayers, ensuring a seamless and uninterrupted prayer experience. With its user-friendly interfaces and optional reminders, iTrackah emerges as an innovative solution poised to transform the way Muslims engage in prayer, guaranteeing precision, inclusivity, and peace of mind in worship.

Keywords: iTrackah; raka'ah tracking; Muslim prayers; movement sensors; solat assistance.

1. INTRODUCTION

In Islam, there are five pillars that every Muslim has to oblige. The second pillar is performing solat which is a form of Muslim prayer. Solat means prayer and is defined as a ritual consisting of specific words and actions that commences with takbiratul ihram (raising hand with specific recitation) and ends with salam (turning face to the right shoulder) with certain conditions (Nik Yusri Musa, 2018). Muslims must perform five daily prayers with specific raka'ah: Fajr (2), Zuhr (4), Asr (4), Maghrib (3), and Isya' (4). Despite the need for full concentration, people sometimes forget their raka'ah count due to mind wandering or forgetfulness, affecting the quality of their solat. According to Blondé et al. (2022), mind wandering is probably one of the most common inner mental activities that we engage in daily. It is an attentional disengagement from the environment which is not a phenomenon without consequences (Girardeau, 2022). Forgetfulness about the number of raka'ah in solat affects both young and old alike.

Having some kind of reminder of the number of raka'ah while praying may become an ideal remedy to this problem. A simple display of the raka'ah will help to reduce the problem without distracting the attention when praying. Saujana et al. (2022) developed a device that counts the number of raka'ah based on head detection by the sensor when a person prostrates. This device also comes together with a real-time clock that buzzes when it is time to pray. Products regarding raka'ah count which utilize praying mats were innovated by Kasman & Moshnyaga (2017) and Sudin et al. (2023) where the sensors were placed at certain parts under the mat such as knee, feet, or forehead. Different from the previous devices mentioned, another product that tracks the number of raka'ah was formulated using an image processing technique. A camera was used to monitor five movements in solat and acted as a prayer movement monitoring system (Alfarizal et al., 2023). The paper is organized as follows: Section 2 covers the methodology, including the model framework. Section 3 discusses the results and the market survey of the product. Section 4 concludes the overall findings.

2. METHODOLOGY

With the same intention of avoiding any doubt about the number of raka'ah while praying, a device called iTrackah is being developed. The name is derived from the words Innovative Tracking Raka'ah. This device is suitable for every Muslim including the disabled person or person who has the excuse to not perform the prostration with the forehead on the praying mat (person who qualified for rukhsah). For the person who is granted rukhsah, the number of raka'ah detected is based on the action of bowing lower than ruku' which symbolizes the prostration. The model framework of iTrackah is illustrated in Figure 1, where the number of raka'ah is calculated based on (1).

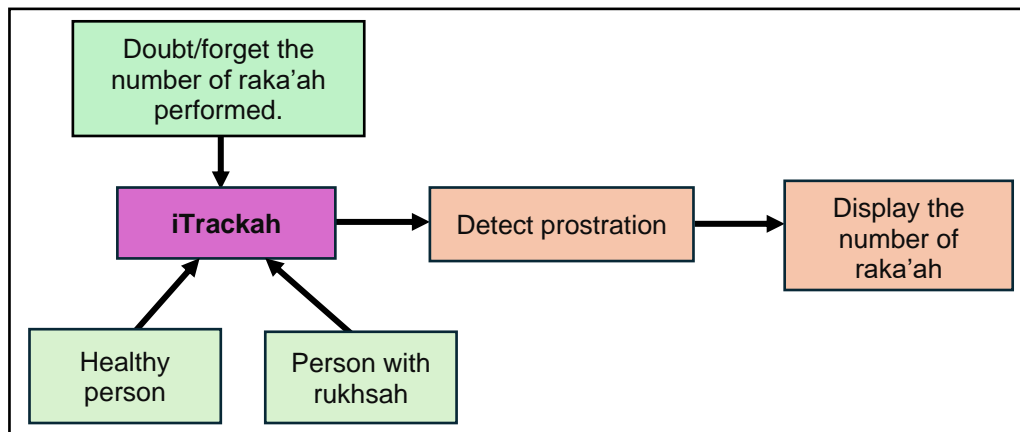


Figure 1. Model Framework

$$\text{number of raka'ah} = \frac{\text{number of prostration}}{2} \quad (1)$$

The prostration detector, iTrackah, uses an infrared sensor to detect each instance of sujud by recognizing specific motions and positions. The embedded system processes this data to confirm complete prostration cycles and calculates the raka'ah count, incrementing it with each validated cycle. The device features advanced technology and a comfortable design, including embedded sensors to track sujud positions and a compact, lightweight form for portability.

To use iTrackah effectively, the user places it on the praying mat near the prostration area. After turning it on, the device initializes and calibrates its sensors. During prayer, it detects each

prostration, and for users with rukhsah, it detects lower bowing motions. The processing unit updates the raka'ah count in real-time, which is displayed on the device. Post-prayer, users can review the total raka'ah count.

The device's efficiency is tested in various locations like mosques, homes, and workplaces, and with different user groups, including those eligible for rukhsah. This ensures its functionality, accuracy, and adaptability across different environments and prayer practices.

3. RESULTS AND DISCUSSION

A short survey has been done to 28 respondents to observe the needs and acceptance of iTrackah and the results are shown in the figure below.

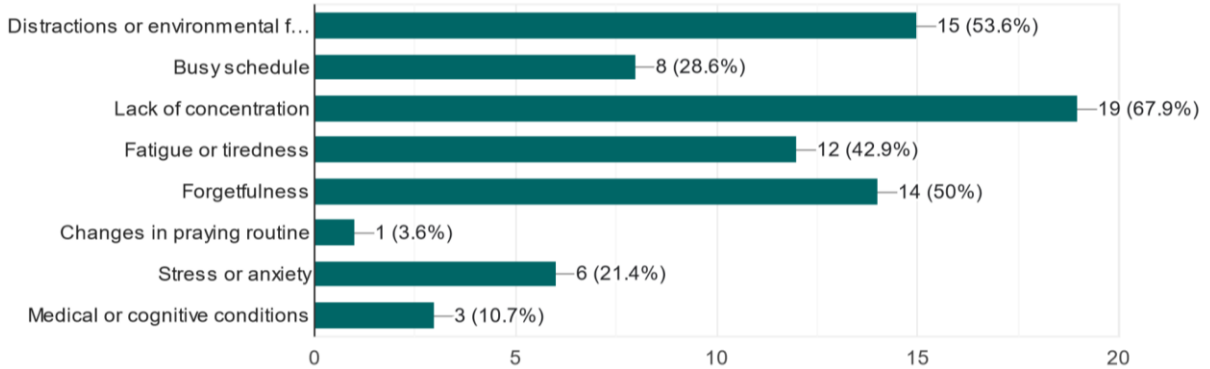


Figure 2. Survey on Reasons for Forgetting the Number of Raka'ah During Prayers

Figure 2 shows that respondents identified several factors making it difficult to track raka'ah during prayer, with lack of concentration being the most common reason.

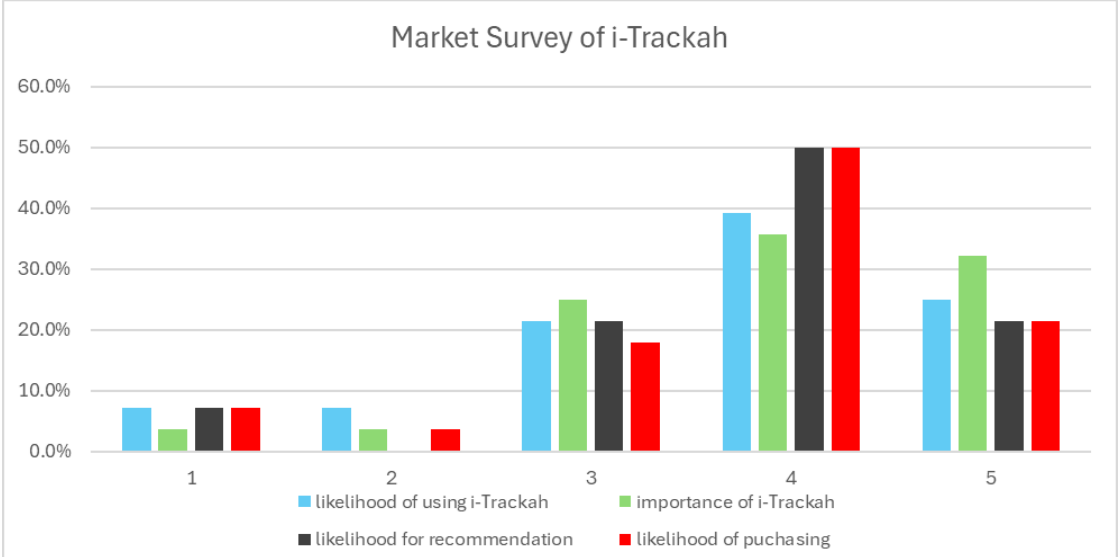


Figure 3. Result of Market Survey of i-Trackah

In Figure 3, the market survey outcomes on the usage likelihood, importance, recommendation, and purchase of iTrackah is presented. Respondents rated their preferences on a scale of 1 (Very Unlikely) to 5 (Very Likely). The results showed that 64.3% prefer using iTrackah for tracking

raka'ah, 67.8% believe it's crucial to have such a device, and 71.4% would consider purchasing and recommending it. These findings indicate strong interest and confidence in iTrackah's potential to enhance prayer quality.

4. CONCLUSION

In conclusion, the short survey aimed to understand the product's customer preferences and purchasing behavior. Key findings revealed a solid demand for a user-friendly device and a preference to have a device that may improve the quality of solat. These insights suggest the opportunity to develop a sustainable product. However, it is still significant to note the limitations of the survey methodology, such as sample size constraints and potential response biases. Moving forward, future research could explore the influence of social media influencers on consumer decision-making in the industry. Overall, the survey findings provide valuable insights for businesses seeking to adapt to changing market dynamics and meet evolving consumer needs.

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