Research

Dr. Ahmad Irfan creates iLocSolat Mobile App for the next-generation prayer time calculation

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GAMBANG, 10 October 2023 - Dr. Ahmad Irfan Ikmal Hisham, a Senior Lecturer at the Center for Human Sciences (PSK), Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA), has developed the iLocSolat Enhanced Geotagging Based Prayer Time Smart Application, which is a next-generation mobile application for prayer time calculation.

According to the Selangor born individual, prayer times were previously determined based on prayer time zones.

"For example, in Paya Besar, we were subject to Zone 2, which includes Kuantan, Pekan, Rompin, and Muadzam Shah.

"The calculation of prayer times was based on the westernmost reference point in that Zone, which is Cempaka, Rompin.

"The drawback of this method is that, in practice, prayer times in the eastern areas like Kuantan come earlier, sometimes as much as seven minutes earlier than the official zone time," he said.

He further explained that one of the practical consequences is the noticeable time difference between areas near state borders.

"The most significant difference is in Tanjung Gemok, Rompin, where prayer times according to Zone 2 representing that area are delayed by up to five minutes compared to the Johor border in Mersing.

"This research started in 2019 when it received FRGS funding.

"In 2023, it reached TRL8 (Technology Readiness Level 8).

"The research began when there were complaints from the residents of Tanjung Gemok about the time difference between their area and Mersing," he stated.

Dr. Ahmad Irfan pointed out that the confusion heightened, especially during the month of Ramadan, involving Suhoor and Iftar times.

Therefore, the Mufti of Pahang State, Sohibul Samahah, Yang Hormat Dato’ Seri Dr. Abdul Rahman Osman, came up with the idea to address the concerns of Tanjung Gemok residents.

i-LocSolat – Enhanced Geotagging Based Prayer Time Smart Application



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Patent
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MTE 2023 Malaysia Technology Expo

Product Background
- Research on iMawaqit® (2021) found that the current practice of prayer time calculation zoning based on the most westernly point in each zone has to be revised.
- This is due to the possibility of 7 minutes time difference within one zone by using ISO time.
- iLocSolat will help user to calculate their prayer time on the exact location, by using the gyroscope, geotagging and satelite technology.

Novelty/ Originality/ Inventiveness
- The prayer time legally must be calculated based on the Muslim current location.
- The current practice by JAKIM, based on the states in Malaysia, is either using the most western point as calculation references or multi-point methods.
- The outcome of the current practice is less accurate; with the possibility of a person in the most easternly part observing the adhan up to 7 minutes late.
- iLocSolat is offered at the right time when a few Muftis urge the usage of latest technology to determine the prayer time.
- It will manipulate the geotagging technology and gyroscope in the smartphone to do the calculation.

Benefits/Usefulness/ Applicability
- iLocSolat potentially solves the problem of huge time differences within the same zone.
- It solves the issue of the gap between adhan in the border between two states.
- Muslims will pray in a much better manner due to the accuracy of prayer time.
- Promoting the acceptance of fatwa on the new technology of prayer time calculation.



Figure 1: Interface of iLocSolat



Figure 2: ISO Time suggest up to 7 minutes differences within same zone



Figure 3: Time gap for Maghrib during Ramadan in Pahang Johor border area



Figure 4: Multi- point references does not solve the issue in border area and it is very difficult to set the location

Status of Innovation
- The product is ready to use for iOS and Android users
- Available on demand for customization purpose.
- At TRL 8 – actual apps development is completed and the final stage of testing for qualification, and final approval from fatwa council in Pahang.

Environmental Impact
- i-Locsolat supports SDGs (3, 4, 11, 12, 16), by reducing reducing the paper for printing the taqwim of prayer time.
- Reduce carbon print - For falak officers, they will travel less to verify the calculation of prayer time in many places.

Publication

- Afiq Adli Razali, Ahmad Irfan bin Ikmal Hisham (2020). Reevaluation of the Method Used in Determining The Prayer Time Zone in Pahang. International Conference of Human Sciences and Civilizations. 9 December 2020. Centre for Human Sciences, University Malaysia Pahang.
- Afiq Adli Razali, Ahmad Irfan bin Ikmal Hisham (2020). Penilaian Semula Penentuan Zon Waktu Solat di Pahang. 10th International Seminar on Contemporary Fiqh. 17-18 November 2020. Fiqh and Usul Department, Academy of Islamic Studies, University Malaya.
- Ahmad Irfan Ikmal Hisham. Usah Sahur Hingga Azan Berkumandang. Artikel Berita Harian, 16 Mei 2019. (Figure 7)



Usah sahur hingga azan berkumandang

Figure 7: Article in BH on whistle blower



Figure 5: Collaboration with Jabatan Mufti Negeri Pahang

Marketability & Commercialisation
- Many religious affairs departments demand for betterment of prayer time calculation method (Muzakarah Falak Kebangsaan 2019)
- This app is customizable to fulfil the market demand. Eg; merchandize for private sector.
- The technology will push the fatwa research on the related issues.
- At the moment, no apps has been endorsed by religious authority. No apps offer calculation based on real location.
- iLocSolat has collaborate with JAKIM, Jabatan Mufti Negeri Pahang and MUIP. More to come.

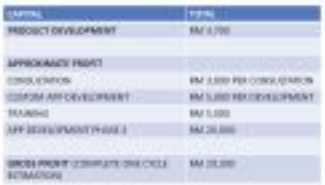


Figure 6: Cost analysis

Achievement/Award
- GOLD ITEX - iFalak 2020, iMawaqit 2021.
- GOLD CITREX 2022, iLocSolat, 2022
- Anugerah Inovasi Khas Sambutan Maal Hijrah Negeri Pahang 2020

Collaboration/Industrial Partner
- Jabatan Mufti Negeri Pahang
- Ripe Excel Enterprise

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"I was assisted by Associate Professor Dr. Mansor Sulaiman, Dr. Tuan Sidek Tuan Muda, and research assistant Afiq Adli Razali.

"This research involved collaboration with the Pahang State Mufti Department, the Department of Survey and Mapping Malaysia (JUPEM), the Department of Islamic Development Malaysia (JAKIM), the Selangor State Mufti Department, and scholars in Islamic astronomy from across Malaysia," he explained.

He further elaborated that iLocSolat utilizes GPS and geotagging technology within modern smartphones.

"The system tracks your location and calculates accurate prayer times.

"Users can compare it with the official times according to the Zone.

"This research will help Muslims pray at the right time, avoid prayer time confusion in border areas between two states, and reduce the reliance on printed prayer time tables by zone," he said.

For now, he mentioned, the application is primarily for academic and celestial research purposes.

"We are working to obtain recommendations and views from the Pahang State Syariah Legal Consultative Committee to facilitate the gradual application of this technology in mosques and for the general public.

The development cost for the iLocSolat self-custom application varies by agency or company, approximately RM20,000.00.

"I hope that religious institutions can provide insights on how this technology can be used by the public in stages.

"This includes proposals for usage guidelines, terms, and the like.

"Other patented products include iFalak and iMawaqit," he added.

For the record, Dr. Ahmad Irfan, who specializes in the fields of astronomy, Sharia, and Hadith, has previously won a gold medal at the Malaysia Technology Expo (MTE) 2023, a gold medal at the Creation, Innovation, Technology, and Research Exposition (CITREX) 2022, and another gold medal at the International Invention, Innovation & Technology Exhibition (ITEX) 2021.

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