



**ICT Virtual Organization of ASEAN Institutes and
NICT
(ASEAN IVO)**

**An IoT-based Public Transport Collection and Analytics Framework using Bluetooth
Proximity Beacons (BLE)
KICK-OFF MEETING
Report/Minutes Form**

I. Organizer:

| | |
|--------------|--|
| Name: | Prof Sharul Kamal bin Abdul Rahim (P2205R01) |
| Position: | Project Leader |
| Institution: | Universiti Teknologi Malaysia |

II. Program:

Date: 15 June, 2022 (Wednesday)

Venue: Pulau Spring Resort Berhad (Johor, Malaysia)

Program Agenda:

09:30 – 10:30

Introductory Session

- Welcome by Prof Sharul Kamal bin Abdul Rahim (10 mins)
- Welcome by Dr. Emoto Hiroshi (NICT) (20 mins)
- Brief introduction of project members (5 mins per organization, 30 mins in total)

10:30 – 11:00

Coffee Break

11:00 – 12:30

Project Introduction and context

- Project overview: objectives, activities and expected results by Prof Sharul Kamal bin Abdul Rahim (UTM) and Dr Sye Loong Keoh (UGS) (45 mins)
- Overview of the system and deployment architecture – (45 mins)



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12:30 – 13:30

Lunch

13:30 – 15:30

Methodology, Field Trial, Data Analytics

- Overview of PAJ Bus Fleet Management System - Syazwan (20 mins)
- Overview of Malang Public Transport System – UB (20 mins)
- Discussion on Field Testing and Data Collection Plan – Sye Loong (30 mins)
- Discussion on data analytic framework Plan – UTB (20 mins)
- Procurement of equipment – Sye Loong (20 mins)

15:30 – 16:00

Coffee Break

16:00 – 17:00

Project Management

- CRDA
- Work plan
- Wrap-up and conclusion of the meeting

17:00

End of Meeting

III. Participants:

| No. | Name | Organization |
|-----|--|--------------|
| 1 | Prof. Ir. Dr. Sharul Kamal Abdul Rahim | UTM |
| 2 | Prof. Abu Sahmah Mohd Supa'at | UTM |
| 3 | Dr. Olakunle Elijah | UTM |
| 4 | Dr. Mohd Adib Bin Sarijari | UTM |
| 5 | Mrs. Siti Fatimah Bt Ausordin | UTM |

| | | |
|----|--|------|
| 6 | Mr. Muhammad Zairil bin Muhammad Nor | UTM |
| 7 | Dr. Sye Loong Keoh | UGS |
| 8 | Dr. Chee Kiat Seow | UGS |
| 9 | Dr. Qi Cao | UGS |
| 10 | Dr. Somnuk Phon-Amnuaisuk | UTB |
| 11 | Dr. Tan Soon-jiann | UTB |
| 12 | Dr. Agung Setia Budi | UB |
| 13 | Dr. Eko Setiawan and | UB |
| 14 | Dr. Adhitya Bhawiyuga | UB |
| 15 | Dr. Chong Yung Wey | USM |
| 16 | Dr. Noor Farizah Binti Ibrahim | USM |
| 17 | Dr. Mohd Najwadi Yusoff | USM |
| 18 | Dr. Kok Chin Khor | UTAR |
| 19 | Dr. Tham Mau Luen | UTAR |
| 20 | Mr. Muhamad Syazwan bin Jasni (Executive Strategic Communication) | PAJ* |
| 21 | Mr. Azwan bin Amin (Chief Finance Officer) | PAJ* |

* Perbadanan Pengangkutan Awam Johor (PAJ) [Johor Public Transport Authority]

IV. Summary of the activities corresponding to the objectives

1. Briefly describe the objectives of the event.

The objective of the meeting was to kick-off the new IVO project, which starts on 1st June 2022. This is also an opportunity to allow all the project team members to get to know each other. Furthermore, we also took this opportunity to discuss the workplan and project schedule, budget allocation, as well as to brainstorm on some aspects of the project implementation, expected results and support needed from external collaborators such as the city councils, transport operators and transport authority.

2. Describe the activities corresponding to the objectives.

Each participant during the hybrid meeting introduced themselves, also there were one to one interaction during the tea break and lunch break for each member to get to know each other.

Dr. Emoto Hiroshi presented the research focus of NICT and gave an overview of the ASEAN IVO organisation.



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The project leader Prof. Sharul presented the workplan from the initial proposal. Discussion on the roles and responsibilities of each team was discussed.

From the discussion, project team members have agreed to a monthly online meeting to monitor the progress of the meeting. The next meeting is scheduled to be on the 13th of July 9.00 am Malaysia time.

Deliberations were made on the expected outcomes of the project. Some of the suggestions include publications in the form of conference papers, magazine to highlight the impact of the project, technical paper on the analysis of the data from the project and conduct a survey on the acceptability of the Project within the community. Other suggested activities are to conduct workshop that aims to bring together local government and transport operators on the usefulness of the proposed system, thus influencing them to come onboard to use the system.

All project members have agreed to the CRDA, and it will be sent to NICT for comments.

With regards to the implementation of the project, some of the challenges identified are: safety of the Raspberry Pi devices that are to be installed at the BUS stations, permission from local city council and power supply. The routes for the project have been identified for the Malaysia site and Indonesia site.

Several suggestions were made on the installation of the Raspberry-Pi (hardware) at the bus stops and road side pole. The implementation team will work with the local city councils to determine the best approach for the deployment of the hardware devices.

The project team members also discussed with the representative of the Johor Transport Authority (PAJ) on the deployment of the project. The PAJ showed strong support to the project and are willing to provide access to current bus service's historical data to aid the data analytic work package. However, a letter of application is needed from UTM representatives.

Dr. Keoh from the UGS team and Prof. Sharul from the UTM team presented the system and the architecture of the overall system. Three routes in Johor Malaysia have been identified, i.e. P411 (Kulai – Larkin Sentral), P211 (Taman Universiti – Larkin Sentral) and S&S 7 (Kulai – JB Sentral).

The UB team presented an overview of the Malang transport systems. They proposed the use of public School Bus for the project. Only a Single Bus is currently used for the route and it runs three times a day. The team suggests that we trial on one route first, and later expand to other routes in the second year.

There was a presentation by Dr. Somnuk from UTB and discussion from the team on the data analytics work package of the project and the relevance of the data to the local



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community. The data to be collected was discussed these include time stamp and location. Other data suggested was data fusion from google using google API to determine other traffic related data and the use of camera on the BUS. However due to the need to modify the BUS to power the camera the suggestions, the vision-based analytics will be kept in view, as it is currently not in the scope of the project.

3. Describe, in detail, if there are changes in the work plan, project schedule, budget allocation, etc. from the initial proposal.

Adjustment was made on the responsibilities as shown in the work plan. Changes are highlighted on red color

| | Owner | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 |
|--|---|-----|-----|-----|-------|-------|-------|-------|-------|
| Procurement | | | | | | | | | |
| Hardware and software acquisition | UTM, UB, UGS | | | | | | | | |
| Consents from PAJ/MBIP/Malang | | | | | | | | | |
| Approval to use existing data for ML | UTM | | | | | | | | |
| Approval for installation & deployment | UB, UTM, UGS | | | | | | | | |
| Project meetings | | | | | | | | | |
| Sites visit and progress monitoring | ALL | | | | | | | | |
| WP1: IoT-based data collection | | | | | | | | | |
| Develop IoT-based data collection framework | UTM, UGS, UB | | | | | | | | |
| Develop the back-end API | USM, UGS | | | | | | | | |
| Performance Benchmarking | UTM | | | | | | | | |
| WP2: Mobile app and Dashboard | | | | | | | | | |
| Design and develop mobile app & dashboard | UTM, UGS | | | | | | | | |
| Populate DB and integrate with back-end | UTM, UGS, UTAR | | | | | | | | |
| Deploy mobile and webapp | UGS, UTM, UTAR | | | | | | | | |
| WP 3: ML and Data analytics | | | | | | | | | |
| Data Engineering & Develop base ML model | UTB, UTAR | | | | | | | | |
| Refine the model with other data sources | UTB, UTAR, USM | | | | | | | | |
| Integrate to the mobile or webapp | UTB, USM | | | | | | | | |
| WP 4: Field Trials | | | | | | | | | |
| Field trials and deployment of IoT/BLE devices | UTM, UGS, UB | | | | | | | | |
| Field trials with full integration | ALL | | | | | | | | |

V. Others

(It is best if you put event pictures here)

1. Pictures



Figure 1: Participants present during the hybrid meeting



Figure 2: Participants present during the hybrid meeting



Figure 3: Group photo at the close of meeting at Pulai Spring Resort, Johor Bahru Malaysia



Fig 4: Representative of PAJ present during the kick-off meeting

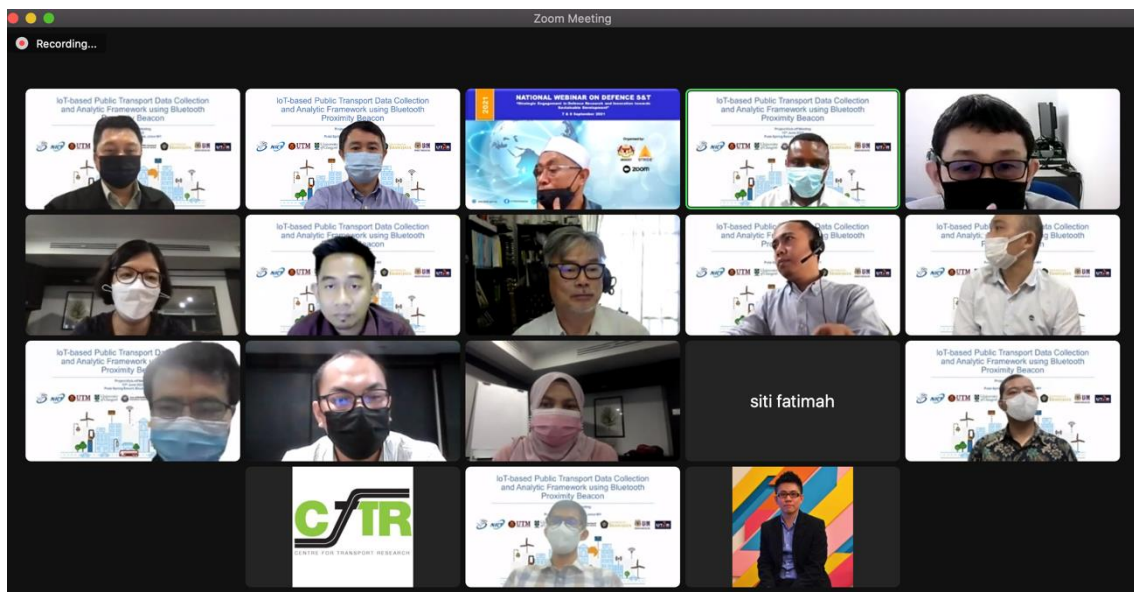


Fig 5: Group photo of the online participants