

Appendix 6.2

Customizable Indoor Tracking System (ITS) for ASEAN Smart Facilities Technical Training on Indoor Tracking System (ITS) for PoC Development

Report/Minutes Form

I. Organizer:

Name:	Nguyen Dang Khoa
Position:	Local leader – International School – VNU, Hanoi, Vietnam (VNUIS)
Institution:	International School – Vietnam National University, Hanoi

II. Program:

Date: 22 - 23 July 2026

Venue: Faculty of Engineering and Technology, International School – VNU, Hanoi

Program Agenda:

The meeting event focused on a 2-Full Day ITS Technical Training Plan

Day 1 (22nd Jul)

- 930am – 9:45am: Kick-off and objectives (Chris)
- 945am – 1030am: Introduction to ITS (Chris)
- 1030am – 11am: Tea Break
- 11am – 12pm: Configuration of UWB Devices (Kevin)
- 12pm – 130pm: Lunch
- 130pm – 3pm: Configuration of Location Server (Ayuni)
- 3pm – 3:30pm: Tea Break
- 3:30pm – 5pm: Hands-on Practical – Lab Deployment
 - Track A Hardware – UWB Infra deployment setup (Kevin)
 - Track B Software – Server and network readiness (Ayuni)
- 5pm – 530pm: Q&A and conclusion (Chris)

Day 2 (23rd Jul)

- 930am – 1030am: Procedures for Site Survey, Mapping and Deployment
 - Track A Deployment/Infra: Site survey and mapping data capture Walkthrough, measurements, zone boundaries, mounting constraints, photos, safety restriction (Kevin & Chris)
 - Track B APIs & data interaction workshop: API endpoints/auth, sample calls, payload schema, event logic mapped to partner use-case (Ayuni & Chris)
- 1030am – 11am: Tea Break
- 11am – 12pm: Continue the parallel tracks as above (Chris, Kevin & Ayuni)
- 12pm – 130pm: Lunch
- 130pm – 3pm: Project-dedicated discussion and consultation for targeted

- 3pm – 3:30pm: production site (All) Tea Break
- 3:30pm – 5pm: Q&A, Summary and Conclusion (All)

III. Participants:

No.	Name	Organization
1	Chrishanton Vethanayagam	MIMOS Berhad
2	Kevin Shane Anak Minggu	MIMOS Berhad
3	Nurul Ayuni Safra Mat Daud	MIMOS Berhad
4	Nguyen Duc Trung	Vinh An Investment & Services., JSC
5	Phung Van Quyen	An Tue, JSC
6	Nguyen Dang Khoa	VNUIS
7	Bui Thanh Tung	VNUIS
8	Vu Xuan Thang	VNUIS
9	Nguyen Xuan Truong	VNUIS
10	Nguyen Minh Thinh	VNUIS
11	Nguyen Thanh Tung	VNUIS
12	Nguyen Khanh Ly	VNUIS
13	Nguyen Thi Anh Thu	VNUIS
14	Le Quang Huy	VNUIS
15	Do Thuy Trang	VNUIS

IV. Summary of the activities corresponding to the objectives.

1. Briefly describe the objectives of the event.

- Host the first physical meeting to discuss ITS-based use-cases for identified industries under the ASEAN IVO Phase II program.
- Conduct 2 full-day technical parallel training of the Indoor Tracking System (ITS) core technology that shall be utilized to develop specific industrial-driven applications.
- Set up lab ITS deployment to facilitate R&D towards supporting the use-case and applications.

2. Describe the activities corresponding to the objectives.

- Conducted a physical kickoff session to align all participants on the purpose of the ASEAN IVO Phase 2 ITS scope and the expected PoC direction. Facilitated partner engagement involving VNUIS team members and potential industrial collaborators (Vinh An Investment & Services and An Tue) to support industry relevance and future PoC adoption.
- Delivered structured training modules covering:
 - ITS overview and system introduction, including concept briefing and platform orientation.
 - UWB devices configuration to prepare anchors/tags and validate device setup readiness.
 - Location server configuration and system readiness checks (server and network preparation).

- *Conducted Hardware/Deployment training: UWB infrastructure deployment setup and procedures for site survey/mapping data capture (walkthrough, measurements, zone boundaries, mounting constraints, photos, safety restrictions).*
- *Conducted Software/APIs training: API and data interaction workshop, including endpoints/authentication, sample calls, payload schema, and mapping event logic to partner use-cases.*
- *Concluded both days with Q&A and wrap-up sessions to confirm understanding, capture issues, and outline next steps. Setup lab ITS deployment to facilitate R&D towards supporting the use-case and applications.*
- *Conducted hands-on lab setup activities to validate end-to-end setup of the ITS environment (hardware installation plus server/network readiness). Both VNUIS and industrial partners (Vinh An Investment & Services and An Tue) have also shared their use cases based on the ITS capabilities that was demonstrated throughout the training.*

3. Discussion with industrial partners & VNUIS in Hanoi

During the Hanoi visit, training and technical discussions were conducted with two industrial partners together with VNUIS to identify practical applications of the Indoor Tracking System (ITS) within their respective operations.

The first industrial partner is involved in woodworking and manufactures complete wooden products through multiple processing stations, including CNC machining, turning, milling, and other woodworking operations. The current production workflow requires operators to manually record the arrival of incoming materials at each workstation. This process is labour-intensive and vulnerable to incomplete, delayed, or inaccurate recording due to operator non-compliance.

Following a review of the ITS capabilities, it was proposed that an automated material-arrival detection mechanism be implemented at selected workstations. The system would automatically identify and log the arrival of materials, thereby reducing operators' administrative workload and improving the consistency and reliability of production records. In addition, ITS data could be used to analyse work-in-progress material movement, including idling time, transition time between stations, queue duration, and processing flow. These insights would support the assessment of operational efficiency, workstation utilisation, bottlenecks, and production throughput.

The second industrial partner focuses on the integration of simple or legacy Automated Guided Vehicles (AGVs) for material transportation. The introduction of ITS-based tracking would provide greater visibility into AGV movements and delivery activities. Potential areas of improvement include comparing planned AGV routes against actual physical movement paths, identifying route deviations or prolonged stoppages, and verifying conformance with the intended operating workflow. The system could also automate the recording of material pick-up, transit, and delivery events, thereby improving traceability, reducing reliance on manual reporting, and

supporting subsequent optimisation of AGV routes and utilisation.

As a practical follow-up, the project team in VNUIS shall conduct a focused discussions & site assessment with each industrial partner to confirm the priority workflow, deployment area, tracking requirements, site layout, material or AGV identification method, and expected performance indicators. An initial pilot shall be limited to one or two representative workstations for the woodworking use case and one selected AGV route or delivery cycle for the AGV use case. Baseline data should first be collected using the existing manual process, followed by a controlled ITS deployment to measure material arrival, dwell time, transition time, route conformance, stoppages, and delivery completion. The pilot findings should then be jointly reviewed with the industrial partners to validate system accuracy, operational benefits, implementation constraints, and integration requirements.

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

- MIMOS Trainer/Participants:
 - Putri Shahnim Khalid who was originally planned as a panel trainer was unable to attend due to an urgent medical procedure recently. She was replaced by Nurul Ayuni Safra Mat Daud who handled all Location Server & software training portions.
 - Dr. Choong Khong Neng was unable to attend due to other project commitments.
- Work plan / schedule: No major changes. The 2-day technical training and consultation were executed as planned according to the agenda.
- Budget allocation: No change to the approved hosting scope for this event.
- Clarifications / refinements: Both the deployment and APIs/data interaction sessions were emphasized as to speed up partner readiness for PoC preparation and to ensure both infrastructure and software integration capabilities are developed in tandem.

V. Others.



Group Photo



Welcome address and introduction by VNUIS leader Dr. Nguyen Dang Khoa



Explanation of UWB-based tracking devices



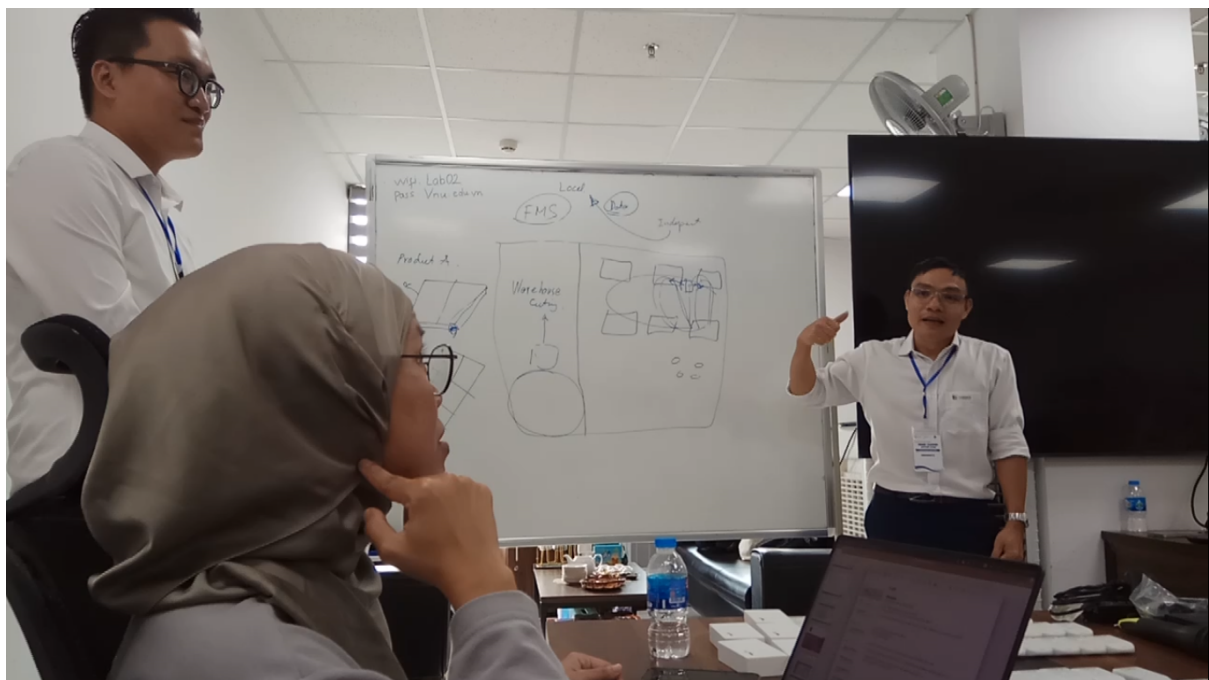
Explanation of UWB tracking features



Explanation on UWB device configuration & practical deployment exercise



Explanation of large scale deployment strategies



Use case sharing from Industry (Vinh An Investment & Services and An Tue) and VNUIS



Setup of UWB infrastructure with 4 anchors with an active UWB tag within coverage



Final group picture at VNUIS lobby before event conclusion

VI. Workshop Evaluation Questionnaire

Questionnaires have been compiled as separate PDF file named “2025-2-2_event_hosting_report_vnuis_techtraining_feedback_forms.pdf”.