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Industrial Visit organized by the department of Industrial Internet of Things

Report on One-day Industrial Visit to STPI IoT Open Lab, Bengaluru.

A one-day industrial visit to STPI IoT Open Lab, Bangalore, was organized by Dr. M. Thilagaraj, Associate Professor and HoD, Department of Industrial Internet of Things, on 10th March, 2025, for the 6th and 4th semester students of IIOT and VLSI. A BMTC bus was used for the transportation. We started at 9.30 a.m. from the college and reached the STPI venue at 11.15 a.m. A total of 46 students from the 6th and 4th semesters of the IIOT and VLSI Department visited the organization, accompanied by faculty members Dr. Subhradip Mukherjee and Lab Instructor Ms. Shyamala K.

Introduction:

STPI (Software Technology Parks of India) IoT Open Lab, a Center of Entrepreneurship in the IoT Domain, initiative of MeitY, Govt. of India, is set up in partnership with Arrow Electronics with STPI. The STPI IoT Open Lab in Bengaluru is a premier facility aimed at fostering innovation and development in the field of the Internet of Things (IoT). STPI IoT Open Lab is not just a platform of infrastructure but a complete support system to enable innovative start-ups to develop disruptive IoT-based applications, products, and solutions across many business verticals. The STPI IoT Open Lab provides complete Training and Maintenance equipment, a sample bank of electronics, technology and business mentoring, an on-site application engineering team, market assistance, and connections to funding sources. The CoE supports start-ups right from the idea stage to the go-to market. The lab provides a collaborative environment for startups and large enterprises to design, develop, and test IoT products and solutions.

Objectives of the Visit:
1. To gain insights into the facilities and services provided by the STPI IoT Open Lab.
2. To understand the various lab equipment and their applications in IoT development.
3. To explore opportunities for collaboration and utilization of the lab for future projects.

After reaching the STPI office, all students were divided into two batches, and each batch was introduced to the lab equipment, sensors, and actuators separately. The STPI IoT Open Lab is equipped with state-of-the-art facilities designed to support the end-to-end development of IoT solutions.

Lab Equipment Details:

During the visit to the STPI IoT Open Lab, students could see and learn about various advanced equipment essential for IoT development. These include:

Smart Energy Meter Test Setup: This setup is crucial for testing and validating the functionality of smart energy meters, which are integral in monitoring and managing energy consumption in IoT-based smart grids. It ensures accurate measurement, communication, and reliability of these devices, facilitating efficient energy usage and real-time data analytics.

Oscilloscope: An essential tool for observing the varying signal voltages in an IoT device, the oscilloscope helps in diagnosing and troubleshooting hardware issues. By visualizing electrical signals, developers can ensure the proper functioning of sensors, communication modules, and other electronic components in their IoT systems.

Multimeter Benchtop: This versatile instrument measures voltage, current, and resistance, which are fundamental parameters in IoT device development and maintenance. It helps in identifying faults and verifying the electrical performance of circuits, ensuring the reliability and efficiency of IoT applications.

ESD, Surge, and EFT/B Simulator/Generator: These devices simulate ElectroStatic discharge (ESD), Electrical Fast Transients (EFT), and surge conditions to test the robustness of IoT devices against electrical disturbances. Ensuring that IoT equipment can withstand such conditions is critical for its durability and safe operation in various environments.

Vector Network Analyzer (VNA): VNA is used to measure the network parameters of electrical networks, particularly useful in designing and testing the RF components of IoT devices. It ensures optimal performance of communication modules by analyzing signal integrity and antenna characteristics.

Power Supply: Digitally Controlled: Providing precise and stable power to IoT devices during development and testing, digitally controlled power supplies are crucial for simulating different operating conditions and verifying the power management efficiency of IoT products.

Power Analyzer—Benchtop: This instrument measures the power consumption and efficiency of IoT devices, which is vital for optimizing battery life and energy usage. Power analyzers help in designing energy-efficient IoT solutions that can operate effectively in resource-constrained environments.

Signal Analyzer: Used for analyzing the frequency spectrum of RF signals, signal analyzers are essential for testing the communication capabilities of IoT devices. They help in identifying signal issues and ensuring compliance with regulatory standards for wireless communication.

3D Printer: A valuable tool for rapid prototyping, the 3D printer allows developers to create custom enclosures and mechanical components for IoT devices. It accelerates the design process and enables iterative testing and refinement of the physical aspects of IoT solutions.

Voltage Dips Generator/Simulator: This equipment simulates voltage dips and interruptions to test the resilience of IoT devices against power quality issues. Ensuring that devices can handle such conditions is crucial for their reliable operation in real-world scenarios where power stability might be a concern.

The visit came to an end at 2:00 pm, and we left the premises and returned to the college at 4:00 pm. Students felt that the visit was informative and interesting. We, the faculty and industrial coordinators, express our sincere thanks to the Management and Principal for permitting students to attend this informative visit.

Outcome of the Event:

The visit to the STPI IoT Open Lab, Bengaluru, was highly informative and provided valuable insights into the cutting-edge facilities and equipment available for IoT development. The lab's comprehensive infrastructure supports various stages of IoT product development, from prototyping to deployment. The collaboration and research spaces also offer a conducive environment for innovation and knowledge sharing.

Figure 1: Our students with the members of STPI, Bengaluru.

Figure 2: Our students listening to welcome speech and introduction of STPI by Ms. Raja Lakshmi.
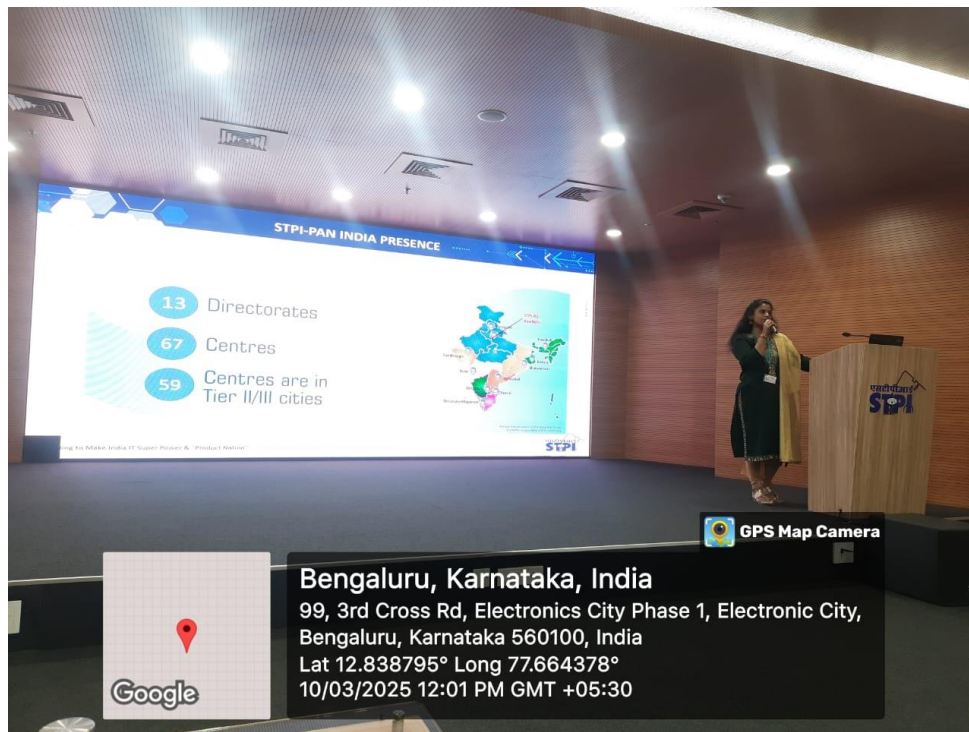
Figure 3: Welcome speech and introduction of STPI by Ms. Raja Lakshmi.

Figure 4: Lab equipment explained by members at STPI.

Figure 5: Lab equipment explained by members at STPI.

Figure 6: Lab equipment explained by members at STPI.