

**Introduction**

During my two-month internship at Samsung R&D Bangalore, I worked on a project involving the Matter protocol for SmartThings under Mr. Suyambulingam Rathinasamy Muthupandi. The primary objective was to enhance the existing system by adding a Color Dimmer Switch feature. The project was primarily built using Kotlin, and virtual devices were utilized for testing purposes. The addition of this feature is expected to significantly improve user interaction with SmartThings, making it a valuable contribution to the project.

**Project Description**

The project focused on adding a color dimmer switch feature to the existing system. This feature allows users to choose a color in the form of hue, saturation, and color temperature values. These values are then sent to the bound virtual device, enabling precise color control.

To provide users with an intuitive interface, seekbars were implemented to choose these parameters. Additionally, the feature includes the capability to turn the color dimmer switch on and off, offering more control and convenience.The project was primarily developed using Kotlin, with significant portions extending into Java and C++. JNI (Java Native Interface) was utilized to modify the values in the binding, ensuring seamless integration and functionality.

### Implementation Timeline

#### Week 1-2: Discussions and Initial Setup

* **Objective:** Set up the working environment and understand project requirements.
* **Activities:**
  + Meetings with the manager and mentors to discuss the project scope and company policies.
  + Setting up IT infrastructure, including laptop and software installations.
  + Assigning mentors and understanding the project goals and timelines.

#### Week 3-4: Initial Development and Setup

* **Objective:** Prepare the development environment and gain necessary access.
* **Activities:**
  + Providing remote access to the Linux workspace.
  + Obtaining firewall access and successfully building the project.
  + Learning about the Matter protocol and its significance in home automation using documentations.
  + Acquiring Git skills required for version control.
  + **Problems Faced:**
    - Issues with access to firewall.
    - Errors in setting up the environment with the project setup.
    - Rectifying setup issues.

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#### Week 5-6: Core Implementation and Learning

* **Objective:** Implement the binding codes and get accustomed to the test environment.
* **Activities:**
  + Developing binding codes across Kotlin, Java, and C++ to pass values to the bound device.
  + Learning JNI for the project and integrating it into the development process.
  + Adapting to the test environment to ensure accurate functionality.
  + **Problems Faced:**
    - Complexity in handling three different layers (Kotlin, Java, C++).
    - Access issues during binding.
    - Challenges in the test environment.

#### Week 7-8: Functionality Completion and UI Implementation

* **Objective:** Finalize the feature and develop the user interface.
* **Activities:**
  + Completing the core functionality of the color dimmer switch.
  + Implementing SeekBars for hue, saturation, and temperature adjustments.
  + Developing a color wheel for user color selection.
  + Attending DSA sessions for SWC advanced exams.
  + Overcoming the issues with binding in test environment.
  + **Problems Faced:**
    - Logical issues while implementing the color wheel.
    - Debugging and refining the UI to ensure smooth user interaction.

### Conclusion

During my internship, I successfully implemented the color dimmer switch feature for the Matter protocol in SmartThings by Samsung. This experience provided me with a deep understanding of real-life feature implementation in a live product. I learned about coding cultures, project management, and collaboration. Additionally, I gained new technical skills, including JNI, the Matter protocol, and advanced concepts in Kotlin, Java, and C++.

This project allowed me to see the practical application of my academic knowledge and provided a platform to develop new competencies essential for my professional growth. The hands-on experience and challenges faced during the project significantly enhanced my problem-solving abilities and technical expertise.

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### Appendices