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Final Project

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**Reflection**

A “smart” thermostat a wireless connectivity device that monitors and communicates the temperature of a particular space. The sensors of the thermostat, whether “smart” or analog in nature, detect the temperature of the space and adjust the temperature based upon the setpoints established. This course and project have displayed the impact and activities of microcontrollers in terms of sensors and actuators within embedded systems.

The TI SimpleLink Wi-Fi CC3220S LaunchPad contains a thirty-two-bit (32 bit) architecture designed as a single-chip wireless microcontroller with 256kb of RAM and security features. The wireless feature along with the ample RAM makes this architecture a contender for integrated Wi-Fi solutions.

Microchip controller, PIC32MX, runs 4-512kB SRAM and includes 16 -2048 KB flash variants in both 28-pin+ options. It is designed for analog signaling, real-time control, and multi-voltage operation for applications such as home appliances, vehicles and IoT.

Multiprotocol MCU K32W061/41 from NXP, formerly known as Freescale, is a focus product line with 640kB flash, 153kB SRAM and offers an ultra-low-current multiprotocol wireless IoT functionality that supports Zigbee and Bluetooth. It offers various analog and digital peripherals and serial communication interfaces.

In conclusion, although all of the architectures and their respective hardware meet the use cases of various needs, some may not meet the requirements. Microchips architecture provides a wide range of SRAM/Flash options in comparison to the other two, which may meet the need of the client best. NXPs’ MCU provides a significant jump in RAM and flash and utilizes concepts found in the next generation of products today, specifically the ultra-low-current feature, making it incredibly efficient. Lastly, The Texas Instrument (TI) product provides high capacity flash (1MB) and significant RAM. It can easily integrate Wi-Fi solutions with its vast libraries that utilize Wi-Fi APIs and offers enhanced security features (WPA3 and IP protection). The TI product is the best solution to meet the needs of our client, SysTec, in their venture to develop a smart thermostat, given its features and its rapid-development capabilities. Although Microchips hardware provides more robust features, the easy-to-use functions of TI makes the most scalable option in my view.

**References**

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