LoRa-Based smart people counter for Building 5

Real-time monitoring of classroom occupancy for attendance, security and power consumption purposes

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Introduction

•Counting students in classrooms manually is time-consuming and inaccurate.

•Teachers and administrators lack real-time information about room occupancy.

•Security personnel must check every room manually before closing, which takes time.

•The power consumption is way to high even with no students in the rooms(ventilation, heating, lights…)

Project objective

Develop a smart system that:

- Automatically counts students entering and leaving rooms.
- Tracks real-time occupancy and updates it on a dashboard or display.
- Sends data wirelessly (via LoRaWAN / Wi-Fi).
- Helps teachers with attendance and security staff with end-of-day checks.
- (Optional) Modifies the heating, ventilation, lighting due to the number of students

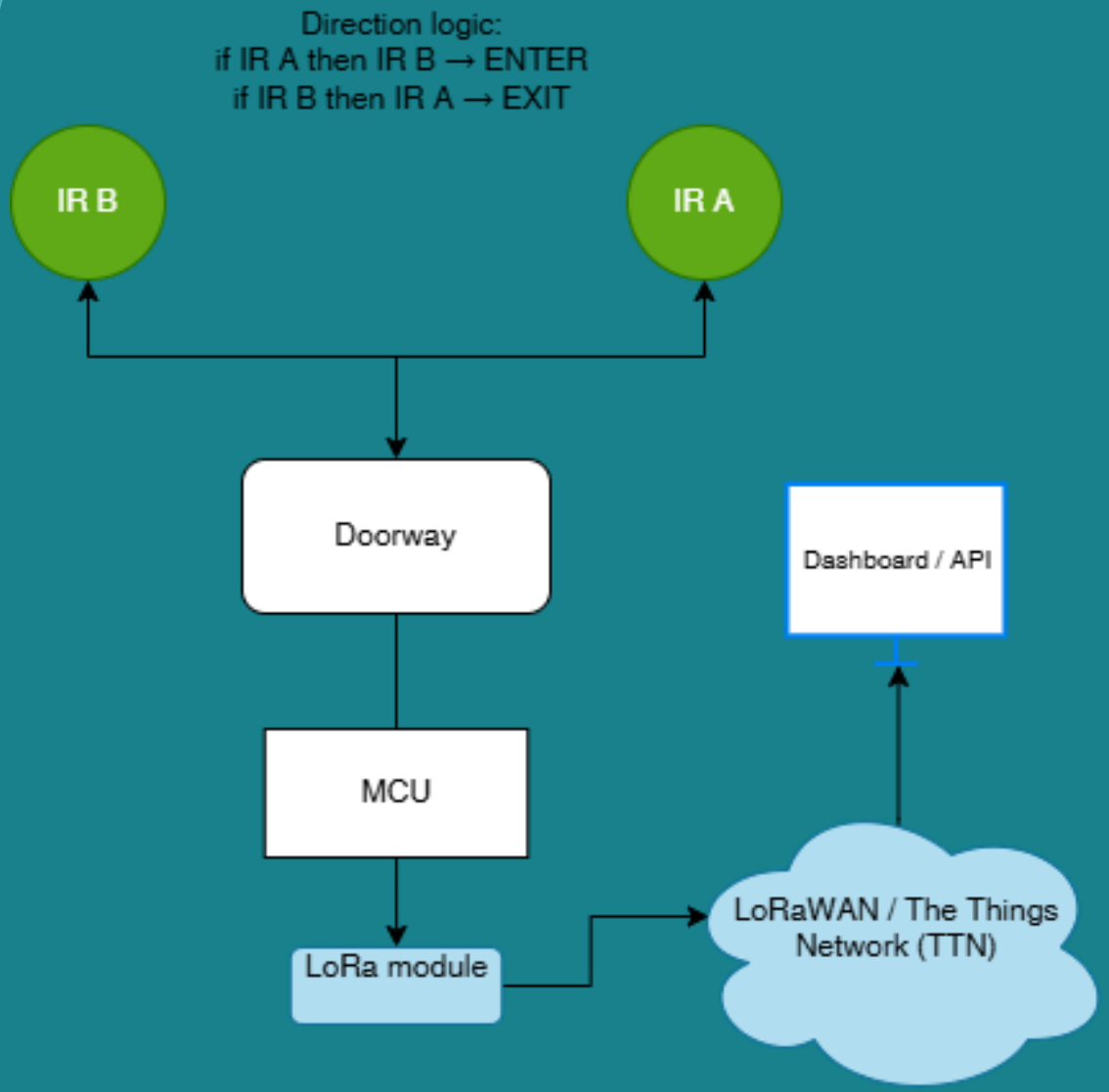
Motivation & Applications

Motivation

- Help select proper size rooms according to the number of attendance
- Increase accuracy of student tracking.
- Provide security officers an easy way to check if rooms are empty before closing.
- Gather useful data for scheduling and space management.
- Save unecessary power consuption

Application

- Classroom monitoring
- Security and safety management
- Research on space utilization



Approximate costs : 75 €

Product	Cost [€]
Microcontroller	30
2 sensors	20
Battery	8
Others	17

Expected Results & Conclusion

- Working prototype that accurately counts students.
- Real-time wireless data transmission.
- Simple interface for both teachers and security staff.
- Expandable system for multiple rooms or buildings.
- Cost estimation less then 100€

Conclusion:

This automatic student counting system offers a practical, efficient, and reliable solution for real-time occupancy tracking improving attendance processes and security operations alike as well as unnecessary power consumption.

Thank You