IoT-Based Cloud Solution to Reduce Sound Pollution in Sri Lankan Public Bus Transportation System

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The main purpose of the paper is to reduce sound pollution related to public bus transportation. Public buses are one of the significant transportation mediums in Sri Lanka. Most of the time Sri Lankan public buses use high-frequency sound systems and horns for entertainment. Due to this reason, public buses are polluting sound and passengers are not comfortable during their journey. As a solution to this problem, this study developed IoT based cloud computing solution to collect data and control the sound system. The architecture of the system is adopted from lambda architecture, and contains Data generating / Producing layer, Data streaming layer and Data processing layer. In Data generating layer, the frequency detectors capture sound frequency inside the bus and pass the data to the cloud server. The Streaming layer used Apache Spark gathered real-time streaming data and compared it with a selected frequency range. The selected frequency range is comfortable for passengers and appropriate to the environment. The proposed IoT system coordinated that frequency and assigned the most efficient audio frequency to the bus. It consisted of raspberry pi, sound sensor, speakers with volume controller. The sensor generated data related to the sound frequency, the raspberry pi connected with the server, and it passed frequency data to the server. After processing the data, the server sends back them to the raspberry pi device. After that, the raspberry pi passed volume level to speakers with a volume controller. This study proposed a system that managed the sound level in dynamic place and reduced sound pollution in public bus transpotation system.

Keywords: IoT,Public Bus Transportation System,Lambda Architecture, Cloud Computing