Sapphire Sounds
Software Requirements Specification
Version 1
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1.   Introduction

1.1.   Purpose

The goal of this Software Requirements Specification (SRS) is to outline the specific functional and non-functional requirements of the *Sapphire Sounds* system. This document defines how the system should behave, what users and stakeholders expect, and what limits apply to its operation. It acts as a foundational guide throughout the software's development, testing, and validation process.

1.2.   Scope

Sapphire Sounds is an intelligent noise-monitoring system created to help manage and resolve noise conflicts in shared housing. It uses a privacy-friendly sensor that tracks sound levels without capturing any audio. When the noise remains above a set limit for a certain amount of time, the system automatically produces detailed, time-stamped reports to assist in fair conflict resolution. The platform supports two main user roles: tenants and property managers.

1.3 Definitions, Acronyms, and Abbreviations

- dB (Decibel): A measurement unit that expresses how loud or intense a sound is.

- Noise Event: A situation where sound levels surpass a set decibel limit for a certain amount of time. This data is used for tracking or reporting purposes.

- Noise Sensor: A device that measures sound intensity but does not record actual audio.

- Report: A document or digital summary created by the system that outlines details about a noise event.

- Threshold: The specific decibel level that, when crossed, activates or logs a noise event.

- Tenant: An individual or resident who uses the system to observe and manage noise levels in their environment.

1.4 References

American Public Health Association. (2021, October 25). Noise as a public health hazard. https://www.apha.org/policy-and-advocacy/public-health-policy-briefs/policydatabase/2022/01/07/noise-as-a-public-health-hazard

Minut. (n.d.). Minut. http://www.minut.com/

RentEye. (n.d.). RentEye. http://www.renteye.com/

1.5 Overview

This Software Requirements Specification (SRS) is divided into three primary sections. The first section, Introduction, explains the document's purpose, scope, important terms, and a general overview. The second section, Overall Description, describes the major elements that influence the system and its requirements. The third section, Specific Requirements, lists both functional and non-functional requirements, organized according to system features.

2.   Overall Description

2.1 Product Perspective

Sapphire Sounds combines a compact noise-sensing device with mobile and web applications. The sensor tracks decibel readings and records an event when sound levels surpass the threshold, creating a timestamped log. This design emphasizes privacy by eliminating any form of audio recording. The product's purpose is to replace subjective complaints with accurate data, helping residents and managers resolve noise-related disputes based on measurable evidence.

2.2. Product Functions

The Sapphire Sounds system performs several core operations that focus on identifying and managing excessive noise. It continuously monitors sound intensity through its noise sensor and identifies when the volume remains above the threshold for a certain duration. When this occurs, the system creates a detailed, time-stamped event report available for property managers to review. Tenants are notified through the mobile or web app, allowing them to take action and prevent further disturbances. Additionally, the platform maintains a record of all past events and includes a reward-based feature that encourages tenants to maintain acceptable noise levels, fostering a more considerate community.

2.3 User Characteristics

The platform is designed for two main types of users: tenants and property managers.

Tenants can view their personal noise activity history, receive alerts when their sound levels are too high, and monitor their progress over time. Property managers have access to time-stamped event data that provides objective insight for resolving complaints without relying on personal accounts or bias.

2.4 Constraints

The software is limited to operating with the specific Raspberry Pi/Infineon/I2C configuration.

The system must also fully comply with a policy that forbids recording audio under any circumstances.

2.5 Assumptions and Dependencies

Every unit is expected to have dependable wireless internet, ensuring the sensor can connect to and send data to the backend.