KnowYourUtility Final Summary

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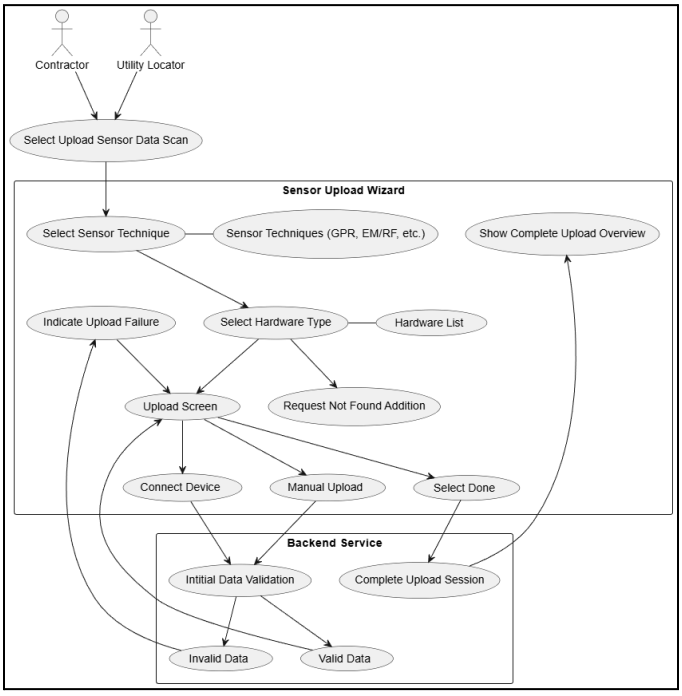
Project Description

KnowYourUtility will provide a useful tool and service for gathering, integrating, analyzing, and disseminating information on locations and details of underground utilities (pipes, electrical systems, internet cables, etc.) throughout the city. It will provide data collection and viewing services for both property owners and contractors, enabling a wide range of utility and use in the field. The data collected, whether from existing databases or via the provided integration services, will be accessible to prospective users for viewing.

The overall effort behind KnowYourUtility is largely focused on data collection for underground utilities, analysis and processing of utility information, and increasing the accessibility of location data for discovered utilities. This goal comes from the motivation to improve and modernize the utility checking industry by addressing the issues from services like “Call before you dig”, which only mark private utility and with questionable accuracy, and the lack of a standardized dataset from private companies. The overall goals for KnowYourUtility can be measured by its implementation usage, the extent to which the integration services for hardware are utilized, and how often the database is queried and updated with newly processed data.

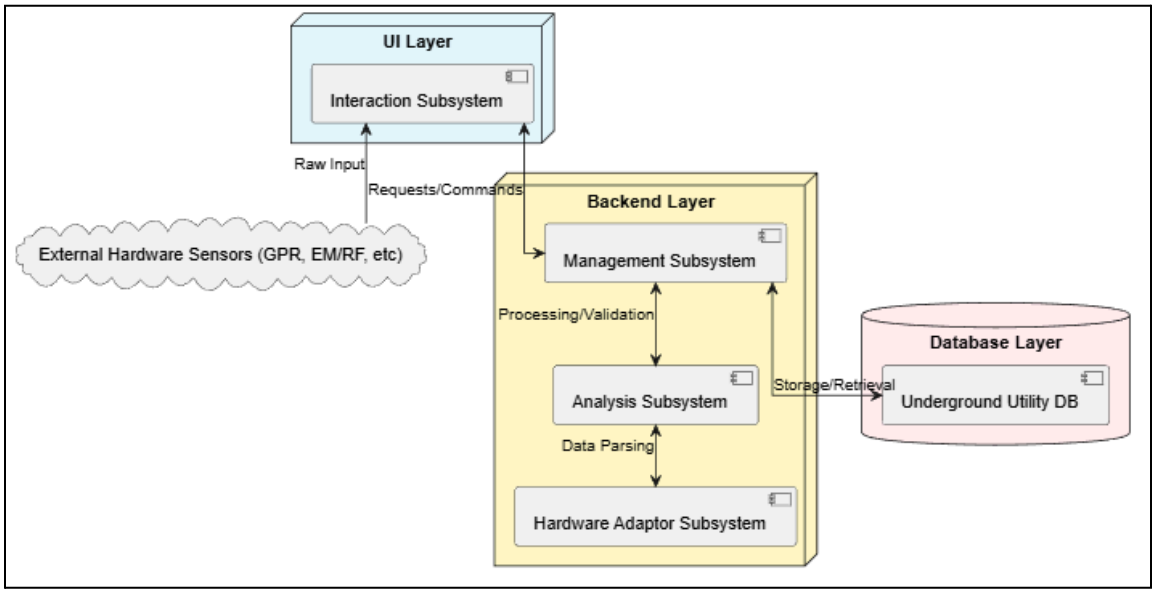
Requirements

The requirements & use cases for the KnowYourUtility system focus on the application's core functionality for users using the UI. For all users, the ability to search for underground utilities by location, using either the device's GPS or an input address or coordinates, to retrieve utility information displayed as a visual map overview at the site. Utility contractors and locators can upload sensor scan data from their hardware devices directly or via a manual upload process, and the 811 operator or organization can analyze the data, identify key information about the utility, and map it into the database. Lastly, the administrator for a given organization or for the KnowYourUtility system as a whole can add or modify users' roles and permissions within their organization.



Design

A proposed architecture for the KnowYourUtility system would implement a three-tiered system client-server architecture, as the application would need to have a user-facing client application (UI application), a backend services layer (used for querying, uploading, etc.), and, importantly, the database layer (needed for storing data on underground utility information).



The final subsystem design will have 4 different subsystems, with the interactions subsystem being in charge of rendering mapped utility and performing user interactions on the user interface, the management system handling the active user sessions actions and of database interactions for utility records and user organization access, the analysis subsystem validating and processing outcomes of sensor data in tandem with the hardware adaptor subsystem that reconciles hardware specific mapping/format to adapt to a general adaptor system for use in analysis.