Radon Project Description Summary

Group 10

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Radon Mitigation is a decentralized data collection and distribution solution to reduce the impact of radon on home residents. With this production users will be able to see local radon levels, knowing the levels within their own property or other areas such as construction sites. Users will get lifetime radiation exposure estimates and risk levels all at easy access with our product. Overall, by using our product, users will have better awareness of the amount of radon they are currently exposed to within their property or local area they are at. We will know if we have reached our goal by keeping track of the amount of new users and current users using/ reusing our product. The more people using our product means that more people now have better access and awareness to the amount of radon they are exposed to.

Currently, when selling houses, real estate agents require the buyers to have their own independent licensed professional conduct 48-hour continuous monitoring test for radon levels. For homebuyers this can cost them between $100 to $350 to hire these professionals. Once they have this data, they share with the state government which they use to gather data for state/ county wide mapping of radon levels around the state. With our Product, Homebuyers will now have access to previous records of radon levels submitted to our product by potentially previous users who may have lived in the same area, which may in turn reduce the need to hire a radon testing professional, thus helping the user save money.

Our product will allow users to view radon levels by geographic area along with providing measurement data of radon levels with the areas. Our product does not perform physical radon testing,

but instead keeps and manages data collection, visualization and analysis of user submitted radon data. External actors will be general users, authorized contributors and organizations utilizing the platform through role based access. The System will handle data processing, data mapping and reporting back data.

In terms of mandated constraints, our system must be able to functionally work as a platform that allows users to view radon levels by geographical locations while also allowing authorized contributors to submit measurement data regarding radon levels. The system must present radon levels using standard measurement units such as pico curies or liters, being consistent with public health guidelines. Since our platform will rely on aggregated environmental and user submitted data, mechanisms must be implemented to ensure the data is valid, reliable. To allow our product to be accessible on multiple devices, it must operate as a web based platform which will allow the platform to be accessed through modern desktops and mobile browsers, making it easily accessible on windows, macOS, Android and IOS.

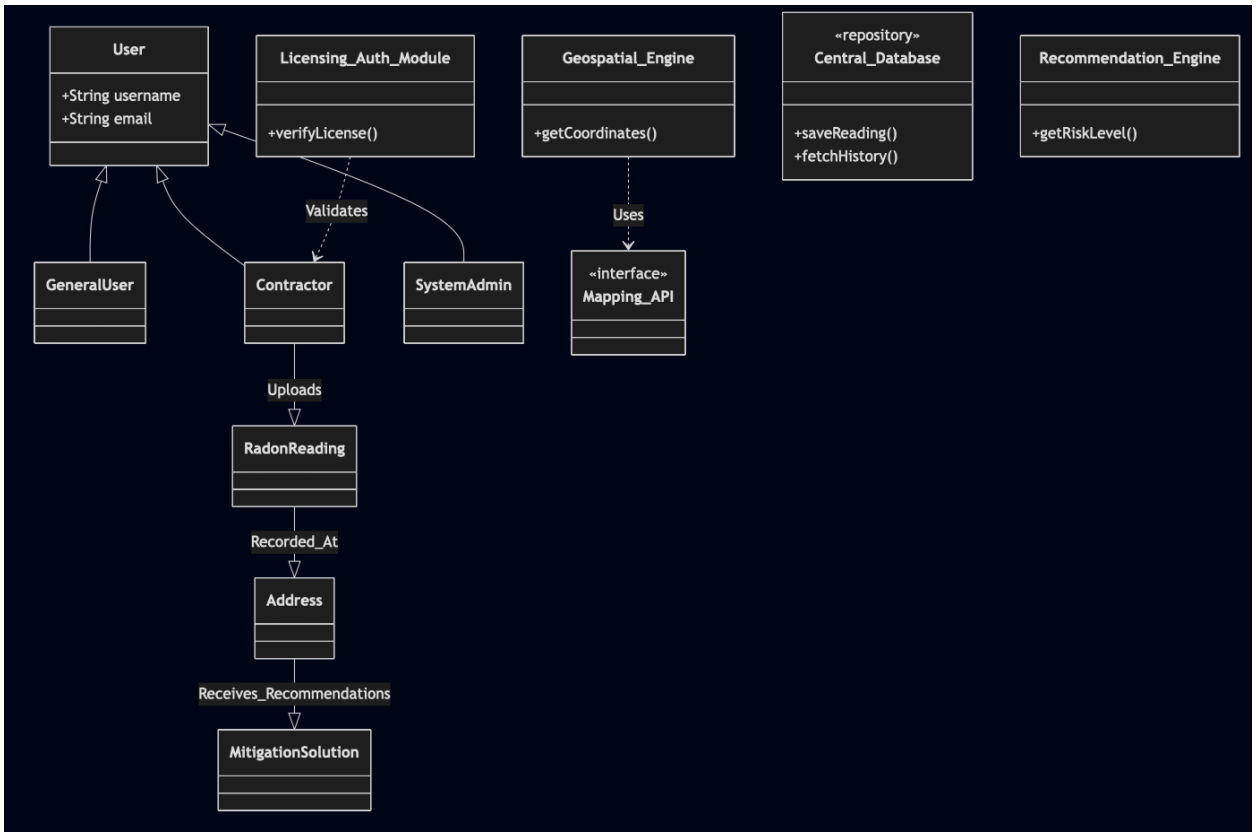
To best implement our platform, we require that the backend be hosted on cloud servers for data storage, geospatial processing and analytics. In addition, we will require the system to be integrated with external sources such as publicly available geological datasets, environmental records and mapping APIS so that the radon levels can be viewed visually by location. In terms of Commercial off-the-shelf components, we will require certain components to be used for cloud hosting, database management, mapping services and application development frameworks.

As this product will eventually run on input from users, we will initially operate with limited financial resources with only usage of efficient development tools and infrastructure. Some of our costs will include cloud hosting services, data storage, mapping APIs and maintenance resources. Budgets

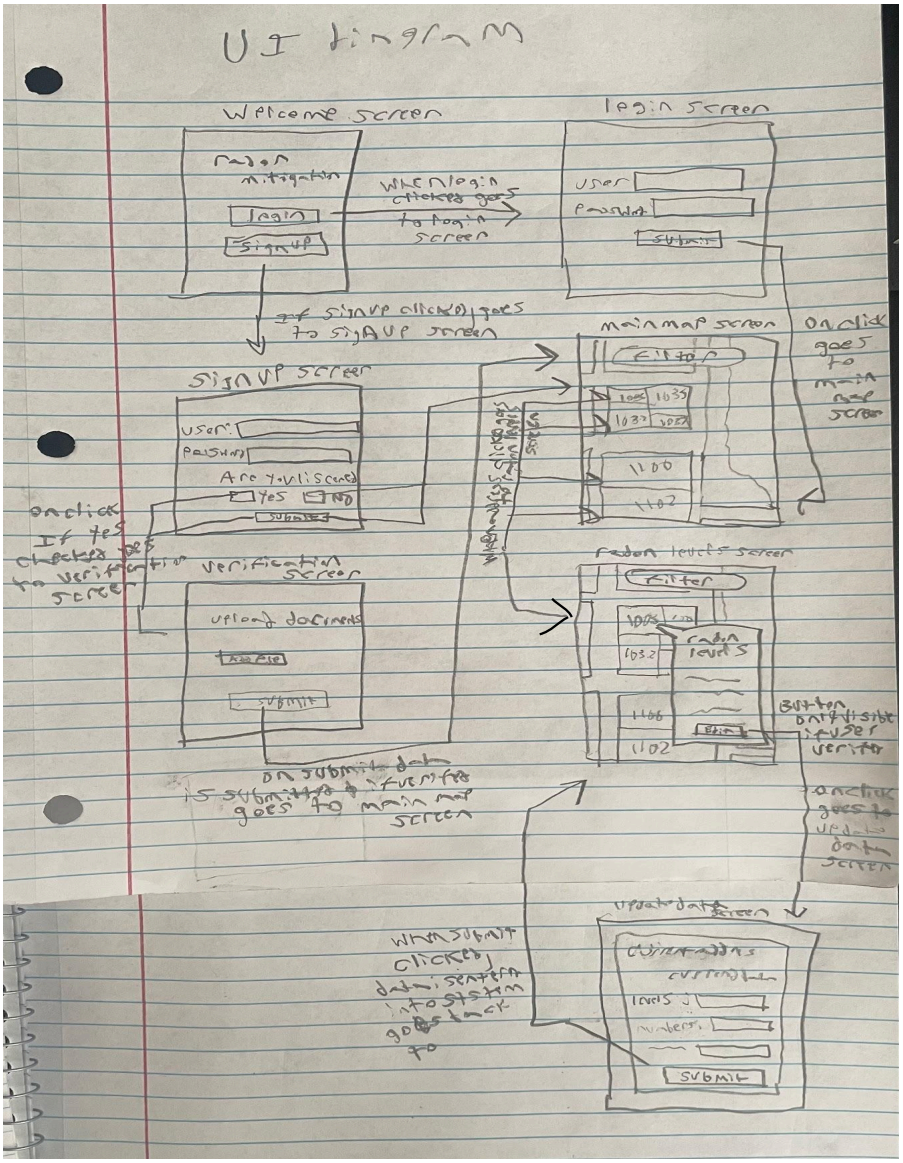
may inflate overtime as we account for any further functionality and technology changes during further development stages.

In terms of Requirements, functionally, we want our Data Integrated in a way that Only Verified Contractors may edit data. We want Localized Visualization, meaning we want a precise view based on address. For Performance requirements we want, Low Latency meaning users should get Results in under 3 seconds. We want High Precision in that we will compare new/old data to clean anomalies. Want our application to be Concurrent to Support thousands of users We want a verification requirement where only authorized users will be allowed to enter new data.

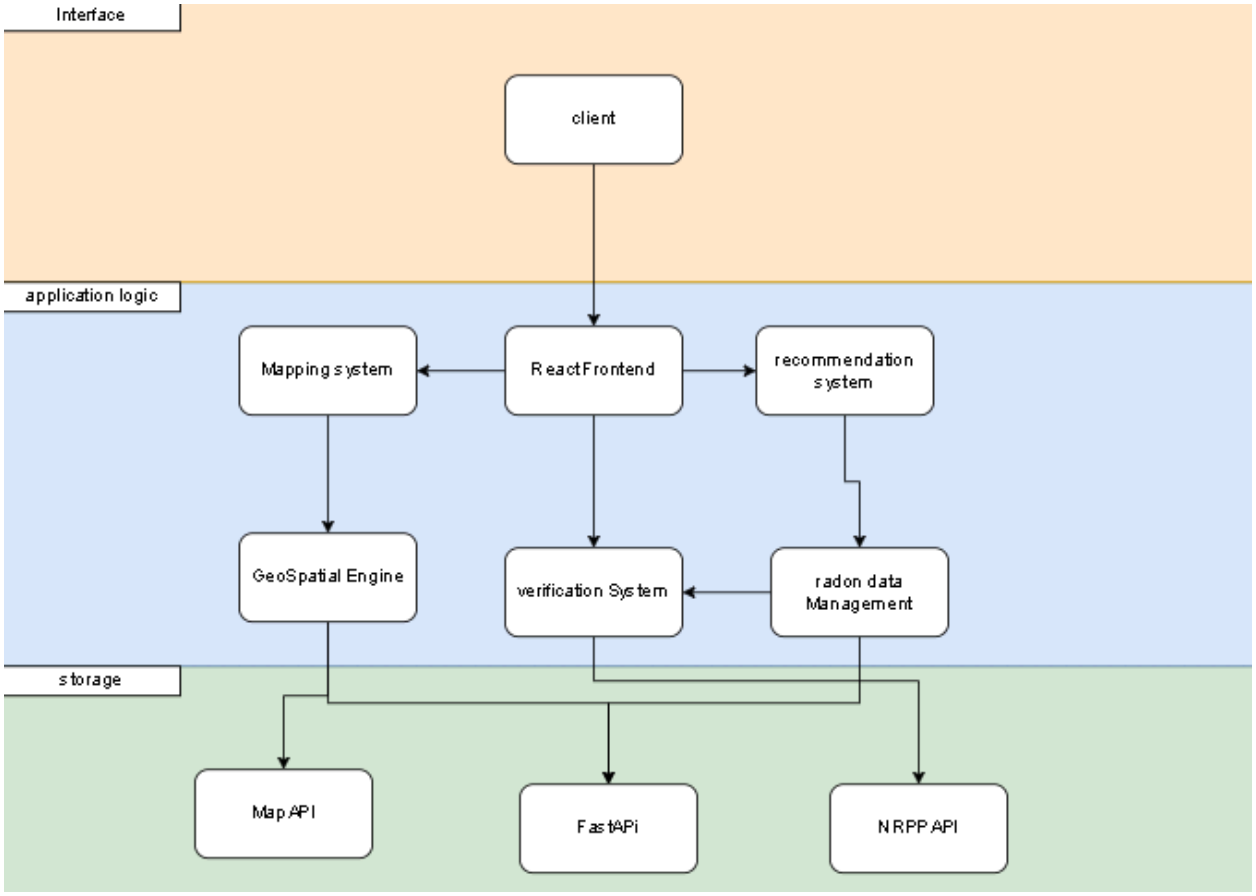
Here is a diagram of how our subsystem will be decomposed:



This is UI diagram of how our application will ideally run:



And this is Final system design diagram:


Interface
client
application logic
Mapping system
React Frontend
recommendation system
GeoSpatial Engine
verification System
radon data Management
storage
Map API
FastAPi
NRPP API