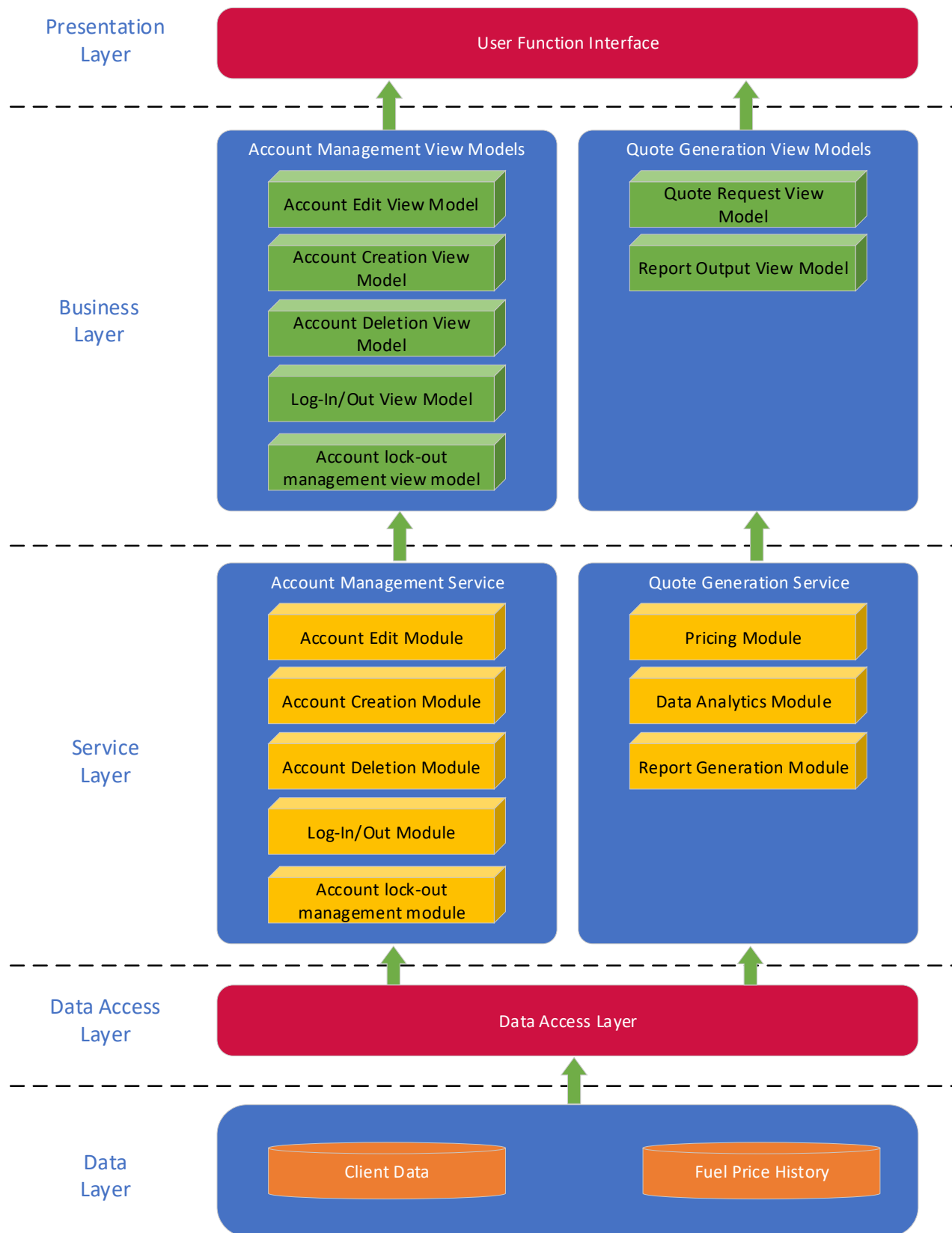1. Our thoughts on the design of the prediction is using machine learning with linear regression. We will train on historical data with the following stages of machine learning:
   a. Train: With about 60% of the historical data.
   b. Validate: We will approach validation with the loss function.
   c. Test: After adjusting the model, we will test with the remaining 40% historical data

   Also, we will create separate modules for login, registration. profile management, fuel quote form, pricing module, a data analytics / machine learning module, and the quote history at least and allow for the possibility of splitting those into more modules if needed. Based on the overview of the nature of client accounts, we will have to implement some sort of security to encrypt confidential information such as passwords and personal information.

2. The development methodology that we will use is the agile method with scrum framework. To keep the project organized, we want to make sure all procedures are checked and properly implemented. If an issue arises, we can quickly go back and find the stage where we to address. This methodology ensures productivity and reduces the risk, increases productivity, and is flexible. The following are the development states that we will implement:

    a. Plan: Brainstorm the container and modules needed for each part of the software.
    b. Design: Start with the framework of pseudocode, only focusing on the most important modules for now.
    c. Test: Code up the test program. The goal is to make the program run properly; not efficiently. At this stage just make the most important components of the software.
    d. Debug: Run the code and attempt to remove any bugs / errors. We will also make any optimization to run the code efficiently.
    e. Deploy: Once the code is ironed out, we can then compile the whole program and use it as if we are the clients.
    f. If needed, re-plan and redesign based on the outcome of testing / deploying
    g. Add some of the rest of the modules that are less important, and maybe add component and module to the software design that proved to be necessary after deployment.
    h. Test, debug, deploy, and adjust the program as needed in iterations until everything is complete

    If there is any reason for potential updates / improvements to the design, the methodology allows us to push for new features / debugging from the feedback received upon deploying the software.

Alexander Bui
Megan Tucker
David Oakley
February 4, 2021

Assignment #1

COSC 4353-20300

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3.

Presentation Layer

User Function Interface

Business Layer

Account Management View Models
- Account Edit View Model
- Account Creation View Model
- Account Deletion View Model
- Log-In/Out View Model
- Account lock-out management view model

Quote Generation View Models
- Quote Request View Model
- Report Output View Model

Service Layer

Account Management Service
- Account Edit Module
- Account Creation Module
- Account Deletion Module
- Log-In/Out Module
- Account lock-out management module

Quote Generation Service
- Pricing Module
- Data Analytics Module
- Report Generation Module

Data Access Layer

Data Access Layer

Data Layer

- Client Data
- Fuel Price History

4. Megan and Alex drafted the answers to questions 1 and 2
   David put together the high-level architecture diagram for question 3.
   All parties agreed to their roles and completed their tasks.

REPOSITORY

https://github.com/megant20/4353project

REFERENCES

https://www.edrawsoft.com/software-architecture-example.html

METHODOLOGY (Google Search)

https://bit.ly/2Yq6pco
https://www.synopsys.com/blogs/software-security/top-4-software-development-methodologies/
https://www.businessnewsdaily.com/4987-what-is-agile-scrum-methodology.html#:~:text=Agile%20scrum%20methodology%20is%20a,with%20a%20potentially%20deliverable%20product.&text=Agile%20scrum%20methodology%20has%20several%20benefits.