Project Proposal: GotoGro-MRM

Solution Direction

In a realistic setting, the project calls for a web hosted database management system (DBMS) with desktop clients on all relevant point of sale (POS) machines. Together these constitute and enterprise framework. However, given the timeframe, we can simplify the implementation to either be entirely web hosted – accessible through a browser – or entirely desktop hosted, where the database exists directly on the host machine. Table 1 shows a comparison between the two alternatives:

Table 1. Comparison of Solution Directions

No.	Desktop Application	Web Server
1	Database is stored locally on machine	Database is stored on the web on a server
2	Program is self-contained	Program must be stored a separate web server
3	Program is not easily accessible from mobile devices	Program can run on any device with internet access
4	No additional hardware required	Server required, either through cloud-hosting or physical storage
5	Generally cheaper	Generally more overheads
6	Requires coding skills only	Requires coding skills, also skill with markup languages HTML, CSS etc.

To make a distinction between the two, we must consider the problem domain, the solution domain as well as personal familiarity with relevant business knowledge, skills, and technology:

Table 2. Knowledge of the Problem Domain

No.	Item	Description	Competency
1	Customer needs	Knowledge of what a customer needs from the business, specifically, why are they using a member-based retail chain	High
2	Business needs	Knowledge of business needs, why they chose to use a member system, what benefits this provides	High
3	Technology	What kind of physical systems do they currently have in place, how do these function, how can they be used/repurposed	High
4	Network Architecture	How does the business currently manage its network, security concerns, how can this be leveraged to solve problems	Medium

Table 3. Knowledge of the Solution Domain

No.	Item	Description	Competency
1	Technology	What technologies exist already to deliver digital reporting, how are these used in industry	High
2	Server management	How to set up and manage a physical/cloud-hosted server to store company information	Low
3	Cybersecurity	What are the threats to the system and how can these be managed	Medium
4	Coding	Competency in a coding language enough to deliver the desired functionality	High

5	UI	Competency in linking raw code to a user interface which can be used by the intended users without issue	Medium

Table 4. Personal Knowledge

No.	Item	Description
1	Worked in retail industry	Being both a customer and a server in a retail environment, I am well versed in the needs of both customer and business
2	Worked on a project with local database management	Having worked on a project involving storing a database on a raspberry pi edge computer accessed through a local network, I have a firm grasp of both database management and UI design, especially with web technologies
3	Website design	I have designed 3 fully operational websites. I have a strong understanding of HTML, CSS and how to implement them to deliver a quality front end

Table 5. Personal Skills

No.	Item	Description
1	HTML, CSS, PHP, Javascript	Strong markup language skills as well as Javascript to enable processing in web applications
2	PgAdmin and PostgreSQL	Strong skills with PgAdmin to administer a PostgreSQL database to store information coming in in Realtime.
3	MySQL	Basic university level of understanding with MySQL workbench and MySQL databases
4	C#, C++, Ruby, Python, Javascript	Strong programming skills, specifically geared towards desktop applications

Given my knowledge and skillset, I feel I am well equipped to handle either solution direction. Even though we will likely pick one or the other, I will present a high-level design for an enterprise architecture involving both solution directions.

High Level Design

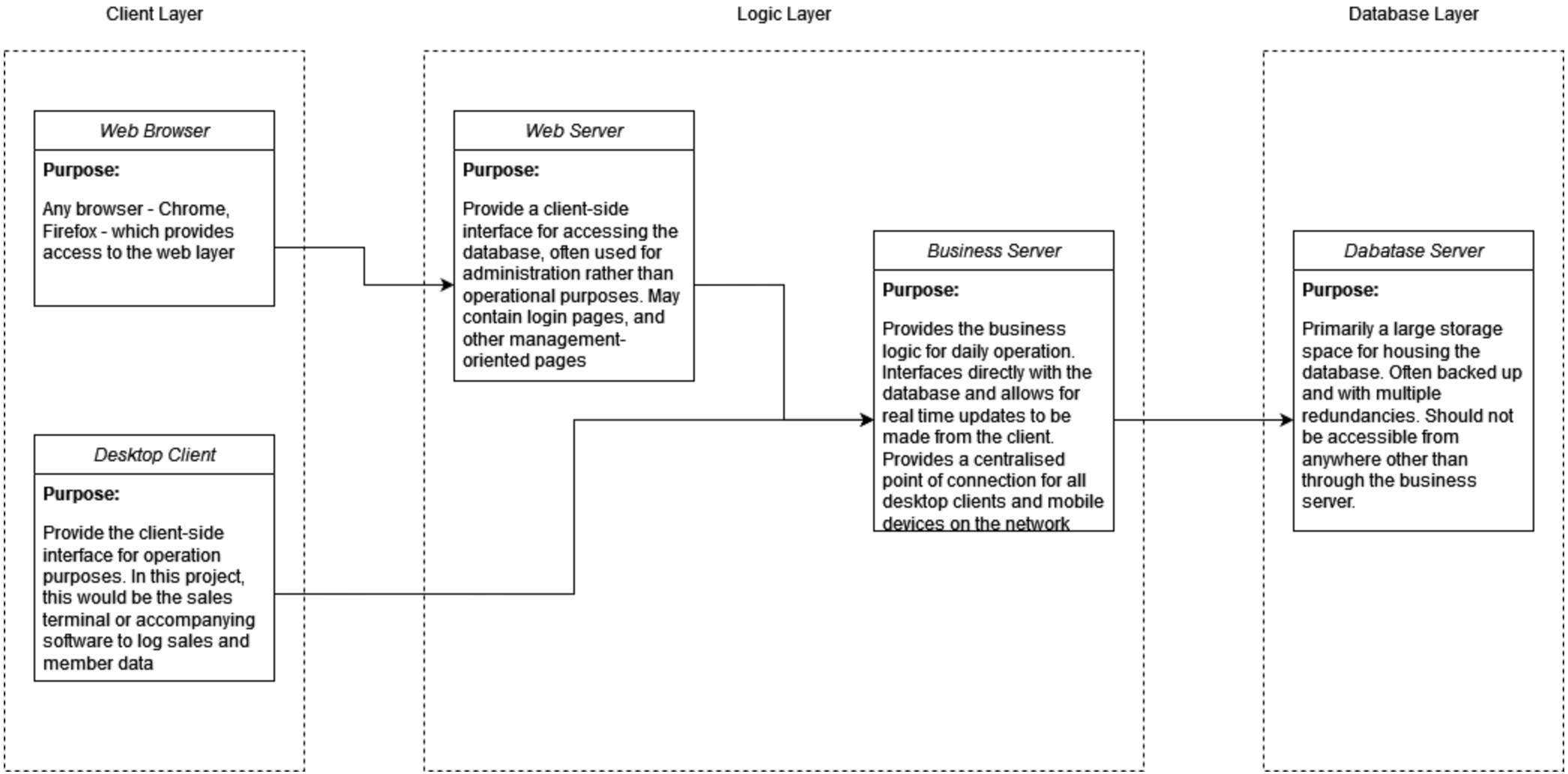
The high-level design is broken down into three layers:

The client layer (application layer), which provides a UI and a visual method of interacting with the system.

The logic layer, where business logic takes place and drives things like calculation and reporting.

The database layer, which houses the raw business data.

Together they create an architecture as follows:


Client Layer
Logic Layer
Database Layer
Web Browser
Purpose:
Any browser - Chrome, Firefox - which provides access to the web layer
Desktop Client
Purpose:
Provide the client-side interface for operation purposes. In this project, this would be the sales terminal or accompanying software to log sales and member data
Web Server
Purpose:
Provide a client-side interface for accessing the database, often used for administration rather than operational purposes. May contain login pages, and other management-oriented pages
Business Server
Purpose:
Provides the business logic for daily operation. Interfaces directly with the database and allows for real time updates to be made from the client. Provides a centralised point of connection for all desktop clients and mobile devices on the network
Dabatase Server
Purpose:
Primarily a large storage space for housing the database. Often backed up and with multiple redundancies. Should not be accessible from anywhere other than through the business server.