VILNIUS UNIVERSITY

FACULTY OF MATHEMATICS AND INFORMATICS

SOFTWARE ENGINEERING STUDY PROGRAMME

Laboratory work

Software system design

Programų sistemos projektavimo dizainas

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Vilnius
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1 Introduction

1.1 Project description

This project aims to solve the problem of businesses using outdated technology and offer new and better ways to control orders in a food-service workplaces (like restaurants) or simple service workplaces (like barbershops).

In the next sections we aim to explain the general flow of the systems, the general management of the data and how these systems interact with each other.

2 Business flows and wireframes

2.1 Food-service business system

The food service business focuses on servicing the customers on the spot. For that there is a menu which the worker can choose items from for quicker ordering and calculation.

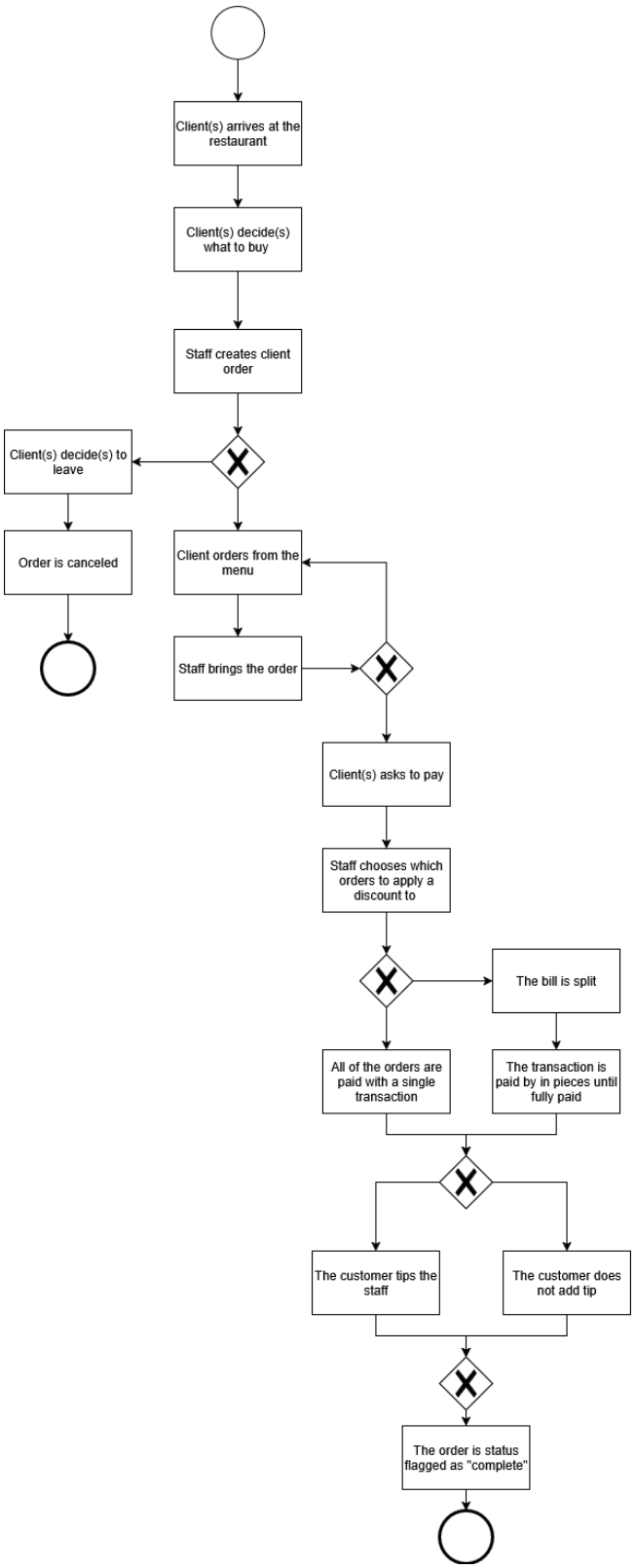
The owner has all of the functions a worker has with additional business management systems.

The owner can:

- Create a dish type or delete an existing dish
- Edit existing dish's name/price/description/discount
- Add new workers / delete existing
- Edit current worker's information
- Create new orders / cancel existing orders that are not yet paid for
- Edit currently ongoing orders
- See the history of previous orders and refund them

The worker can:

- Create new orders / cancel existing orders that are not yet paid for
- Edit currently ongoing orders
- See the history of previous orders and refund them

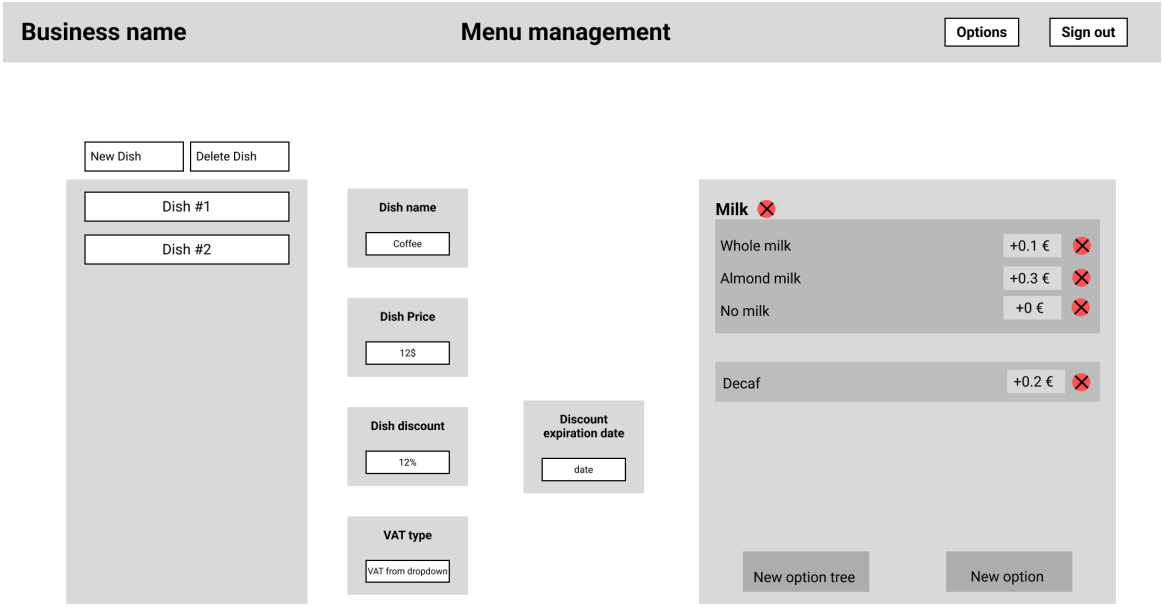


1 figure. *Food service worker workflow*

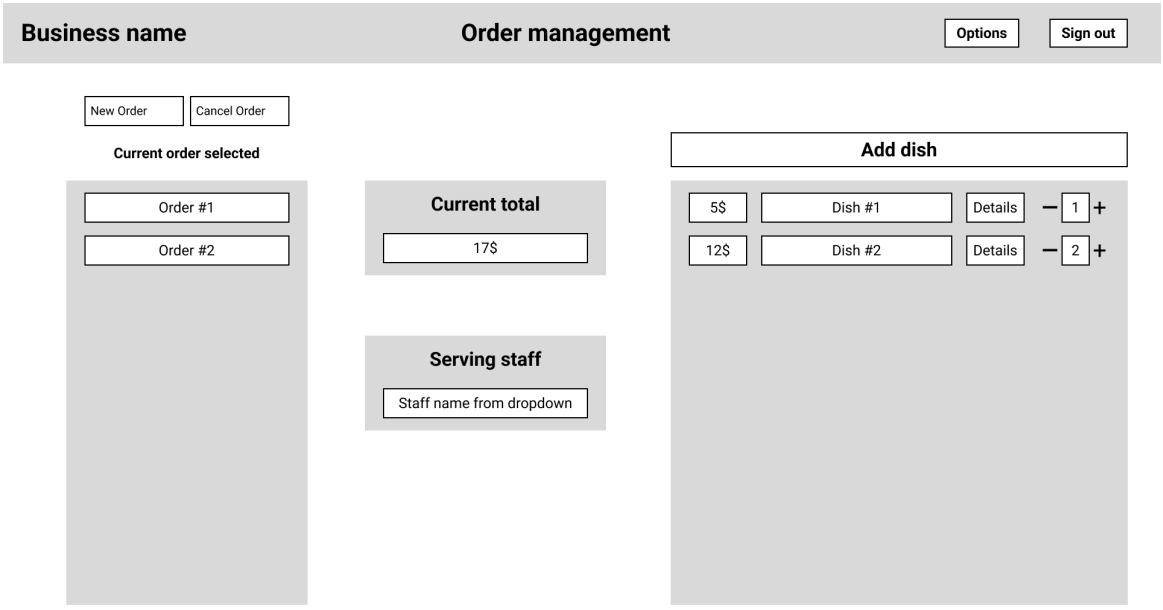
In 1 figure. we take a look at the general workflow the worker in a food-service business has when adding new orders or finalizing old ones.

The worker services the customer by first creating the client order, this way a new order is created in the system. After creating the order, at any point it can be edited to add more orders until

the customer is ready to pay. When the transaction is complete the order is finalized and marked as ”complete”.

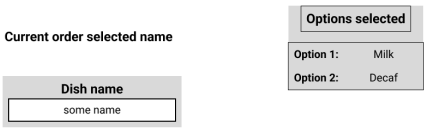


2 figure. *Menu management wireframe*



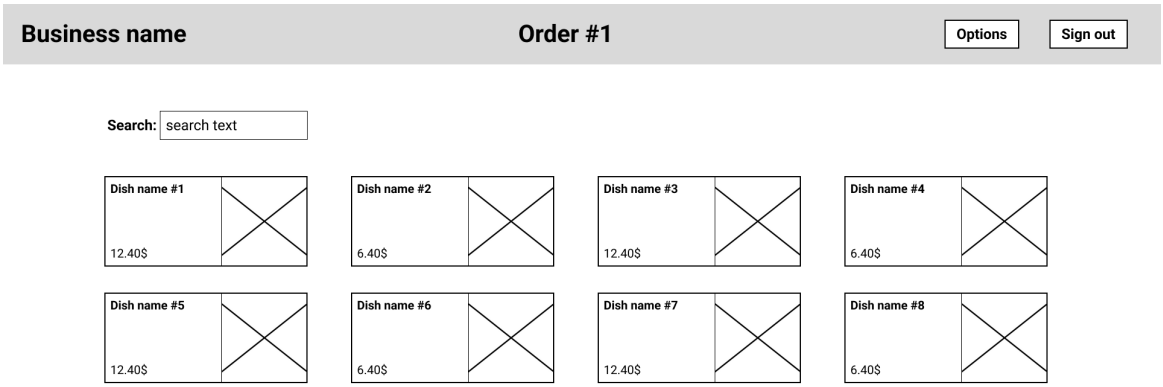
3 figure. *Order management wireframe*

Order management is accessed window is accessed primarily by workers during work hours to create new orders.



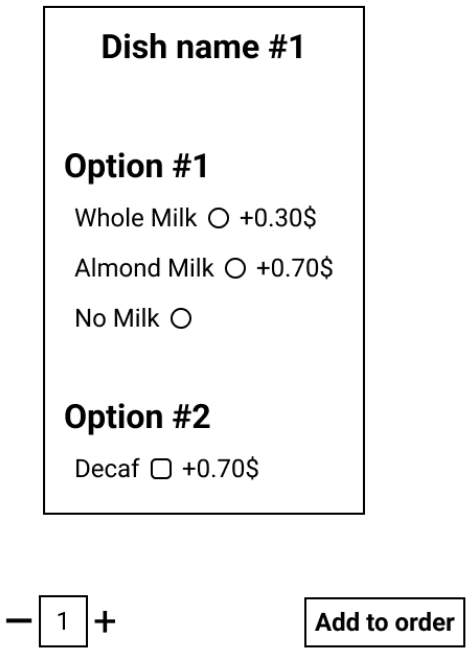
4 figure. *Order management popup wireframe*

In 4 figure. we can see the popup which will provide additional information about the particular dish.



5 figure. *Add order to the dish wireframe*

This menu will hold all the possible choices from the menu, by clicking on the specific dish the user is shown a popup for options.



6 figure. *Wireframe for a popup when adding options to a dish in an order*

This is the wireframe with all the options a dish may have.

2.2 Appointment based business system

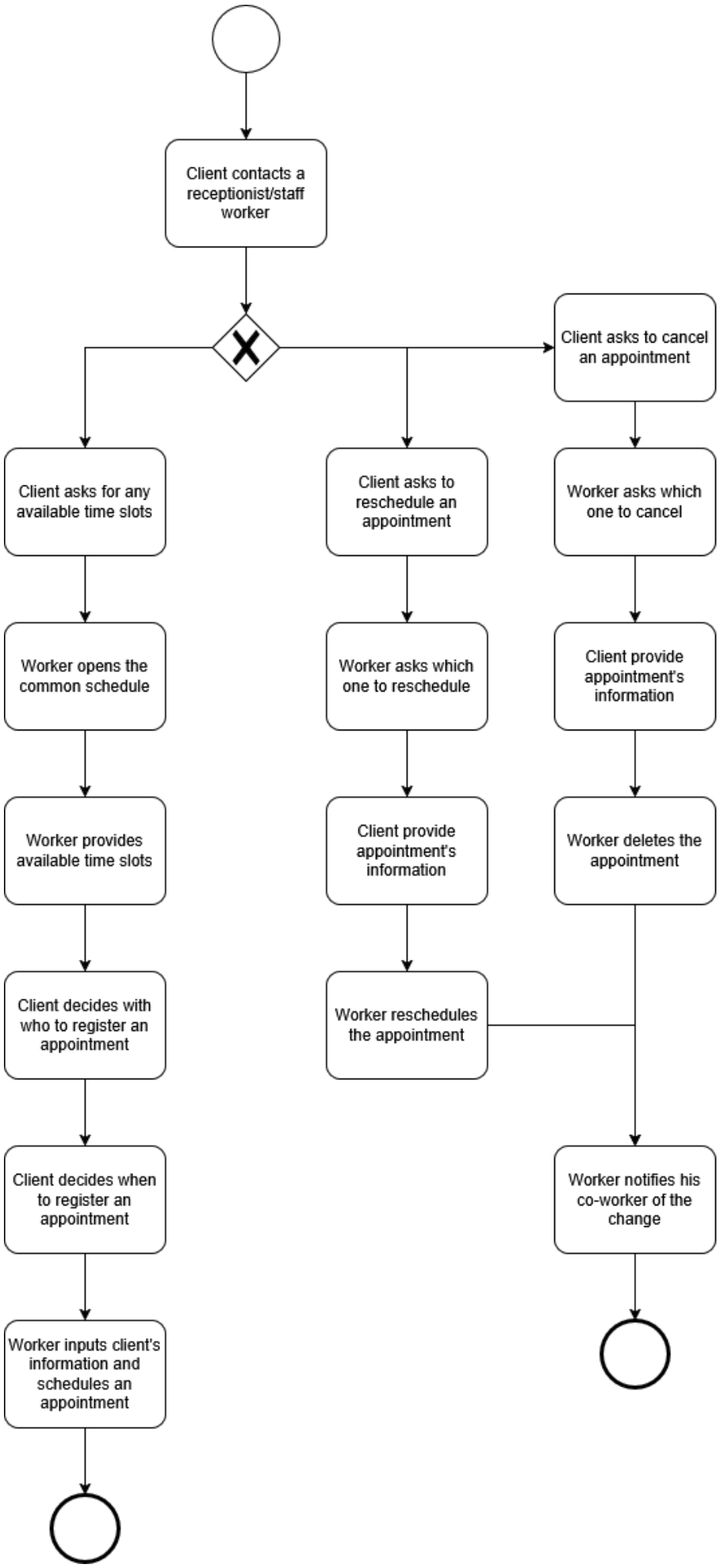
Similar to Food-Service business with a few distinctions, primarily the service business configures which services are available for appointments, while also having the ability to see and configure the schedule to add appointments for specific workers.

The owner can:

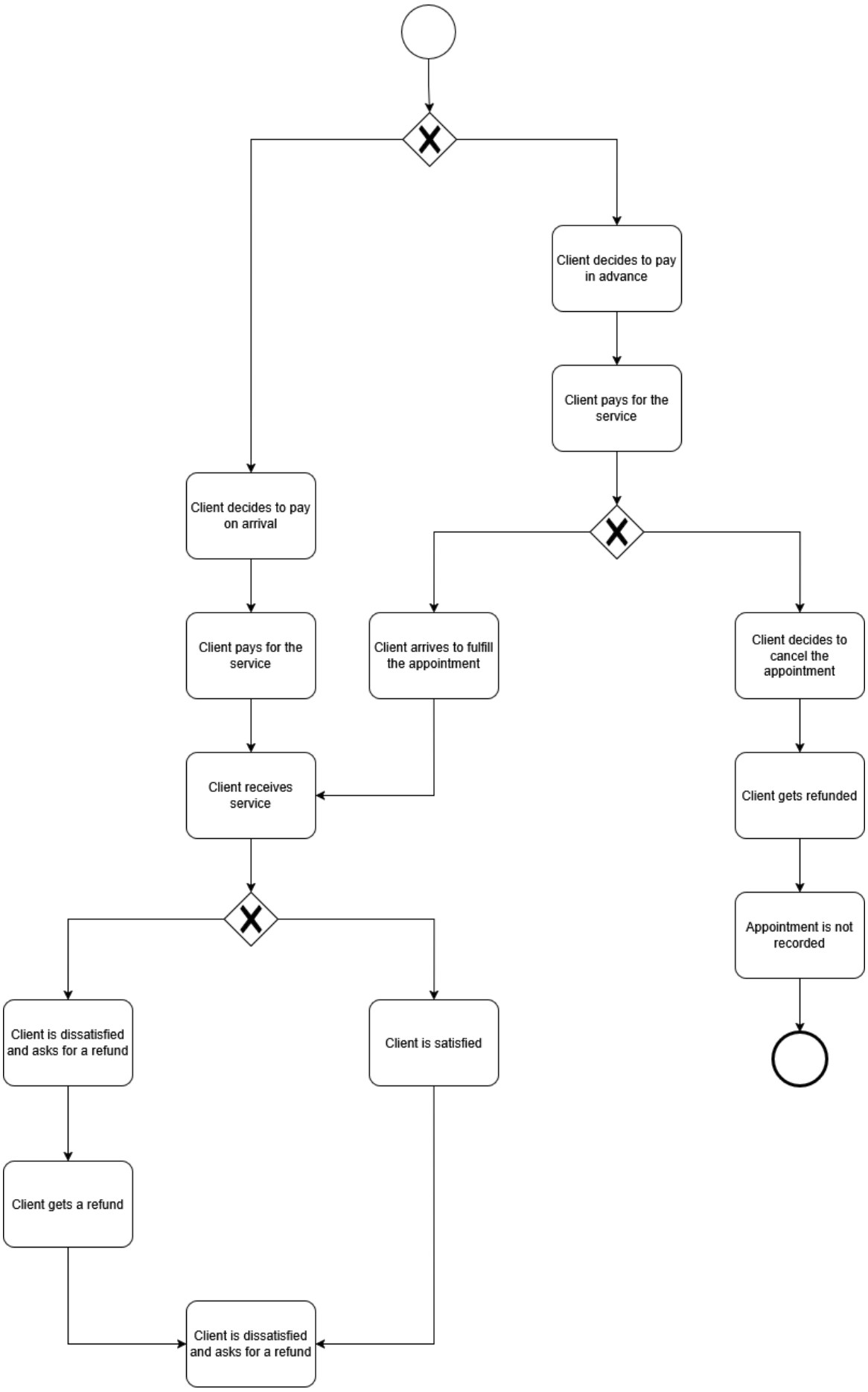
- Create a service type or delete an existing type
- Edit existing service's name/price/description/discount/duration
- Add new workers / delete existing
- Edit current worker's information
- Create new appointments / cancel existing appointments that are not yet paid for
- Edit currently scheduled appointments
- See the history of previous appointments and refund them

The worker can:

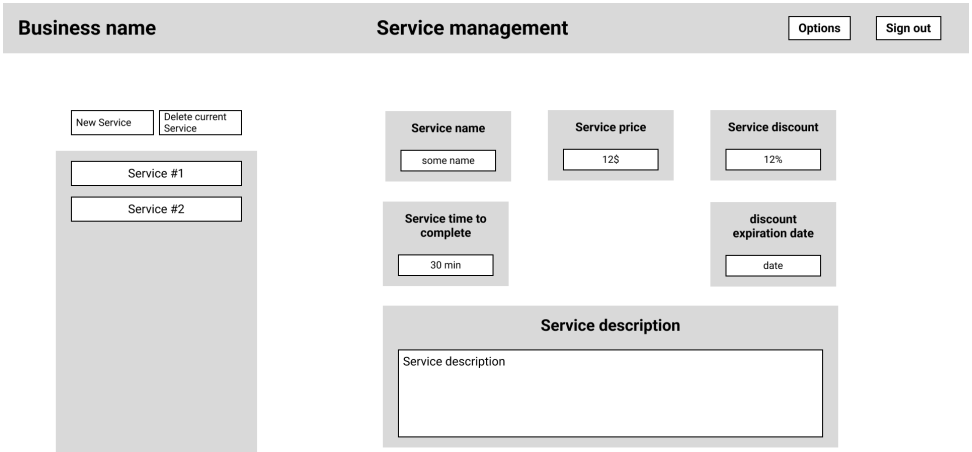
- Create new appointments / cancel existing appointments that are not yet paid for
- Edit currently scheduled appointments
- See the history of previous appointments and refund them



7 figure. *Appointment reception*



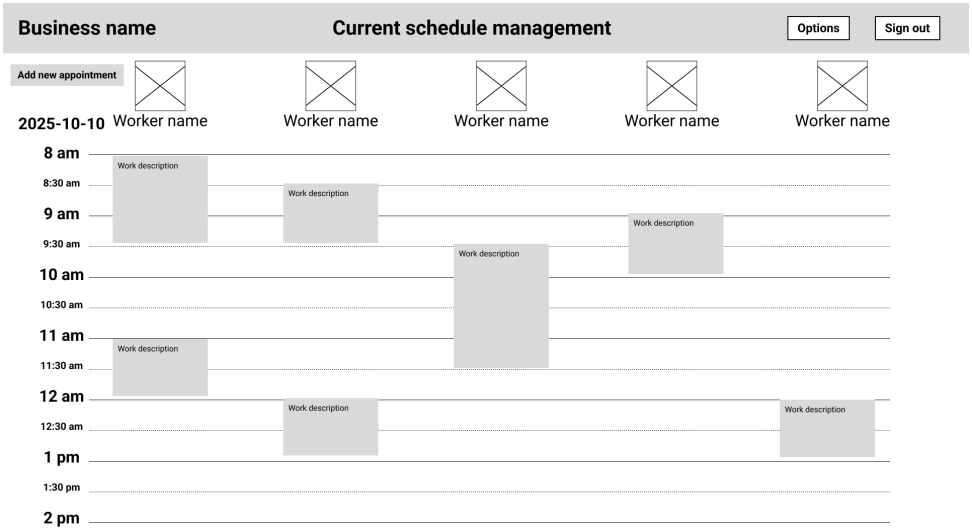
8 figure. *Appointment payment workflow*



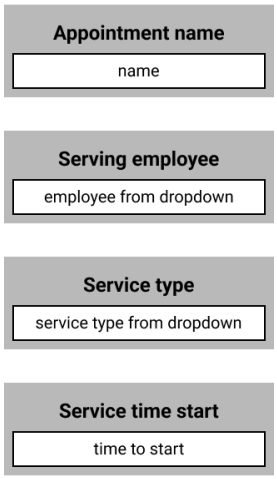
9 figure. *Service management wireframe*

10 figure. *Schedule overview wireframe*

Here is the window both owner and the worker can see, the schedule is manipulated through a virtual calendar, by selecting a day both the worker and the owner can see that day's scheduling for each worker.



11 figure. *Day scheduling wireframe*



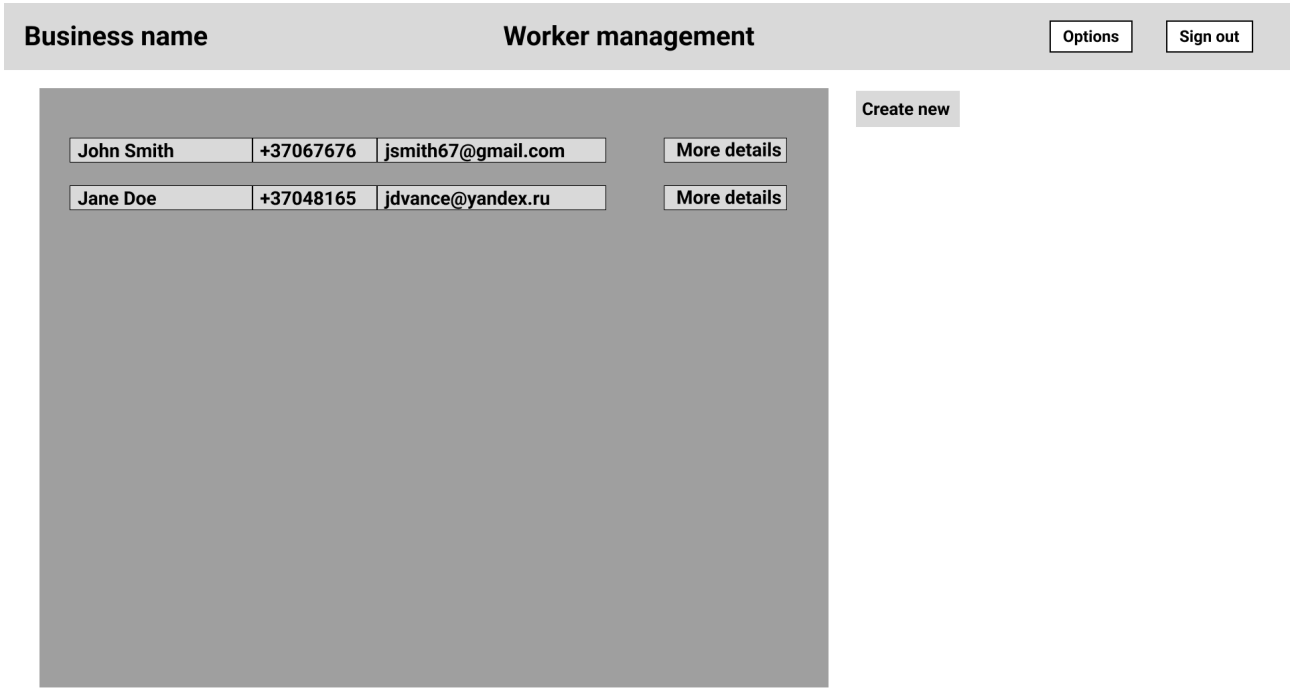
12 figure. *Add new appointment wireframe*

2.3 Super admin system

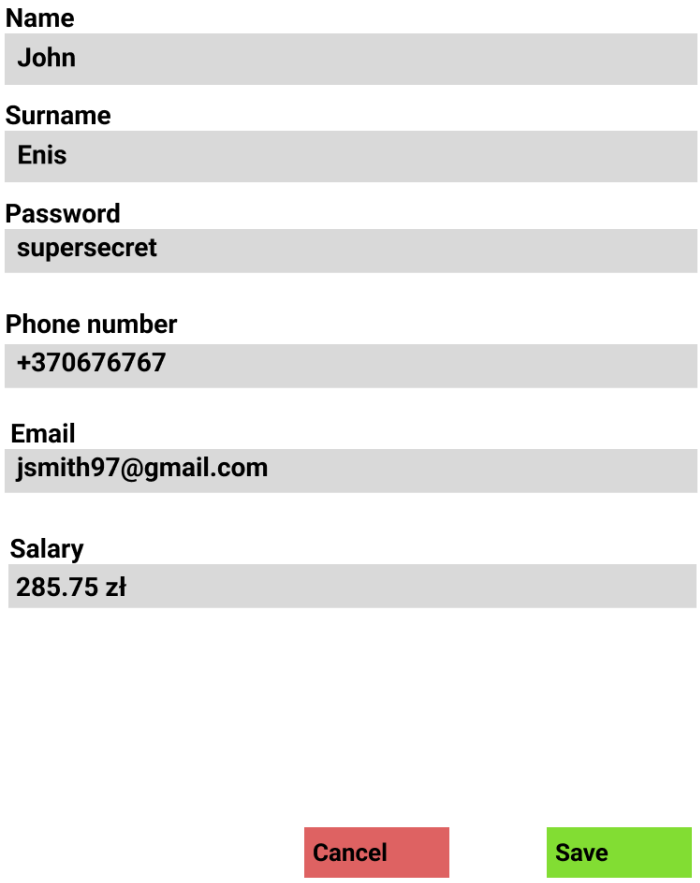
13 figure. *Wireframe of superadmin's view of businesses*

This is how a superadmin sees businesses's table. He chooses among ones in the list to edit in case of a technical problem.

2.4 Worker Account management system



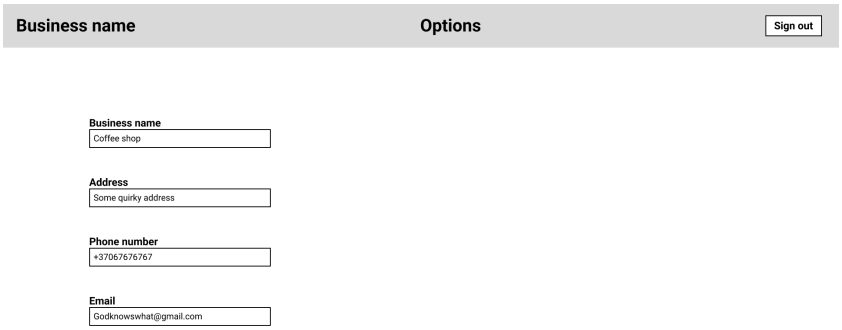
14 figure. *Worker management screen*



15 figure. *Worker management pop-up*

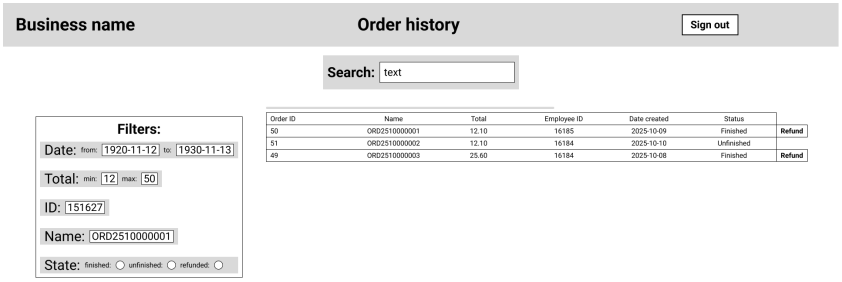
Pop-up when clicking ’More details’ or ’Create new’. This pop-up offers basic CRUD options for workers in the business.

2.5 Worker Account management system



16 figure. *Worker management pop-up*

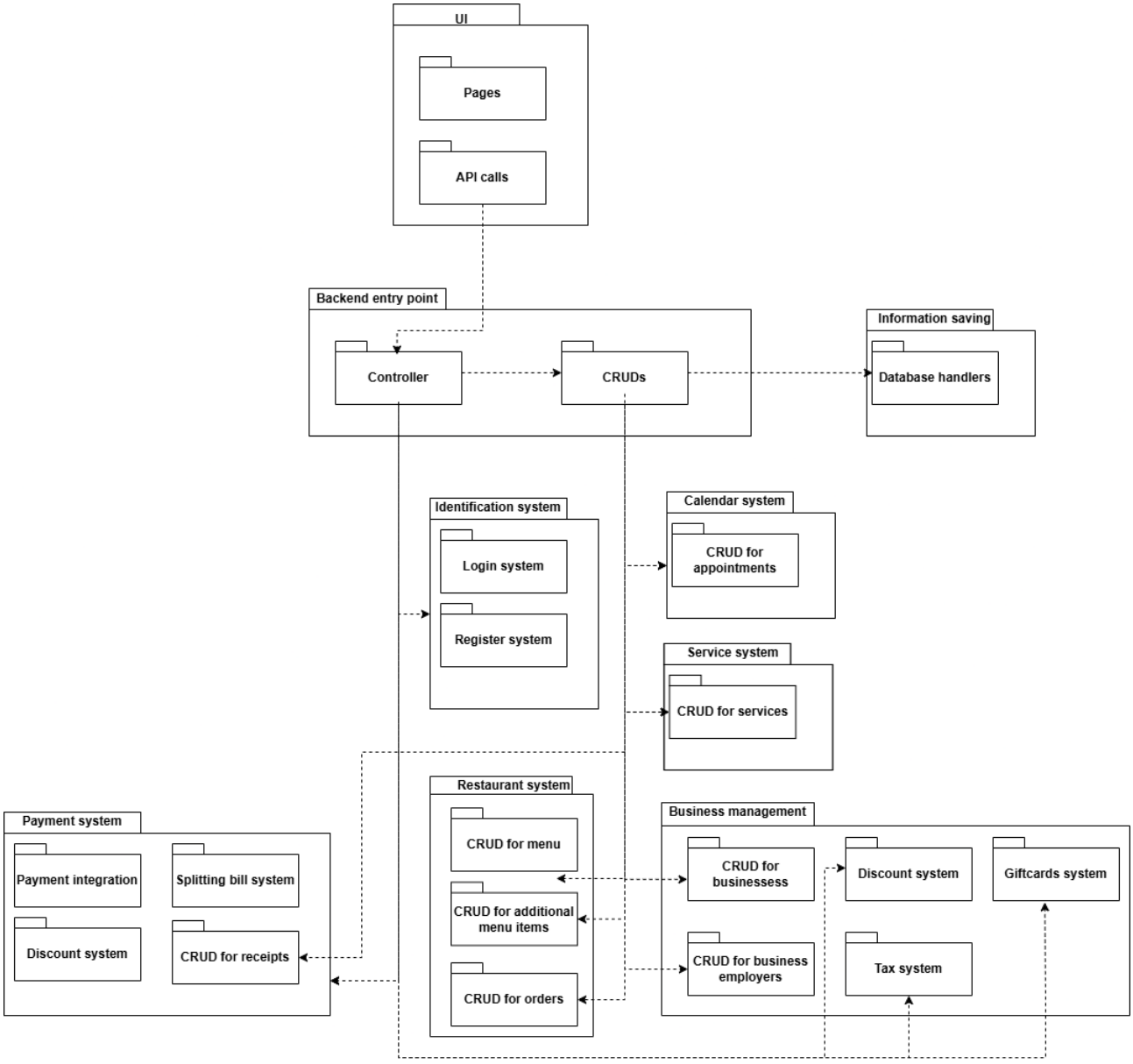
2.6 Order/Appointment history preview



17 figure. *History wireframe*

17 figure. shows how the history table for worker or owner looks like. The table can be navigated horizontally and vertically. The history is limited by default via paging that can be modified via API.

3 High level architecture



18 figure. *High-level system package diagram*

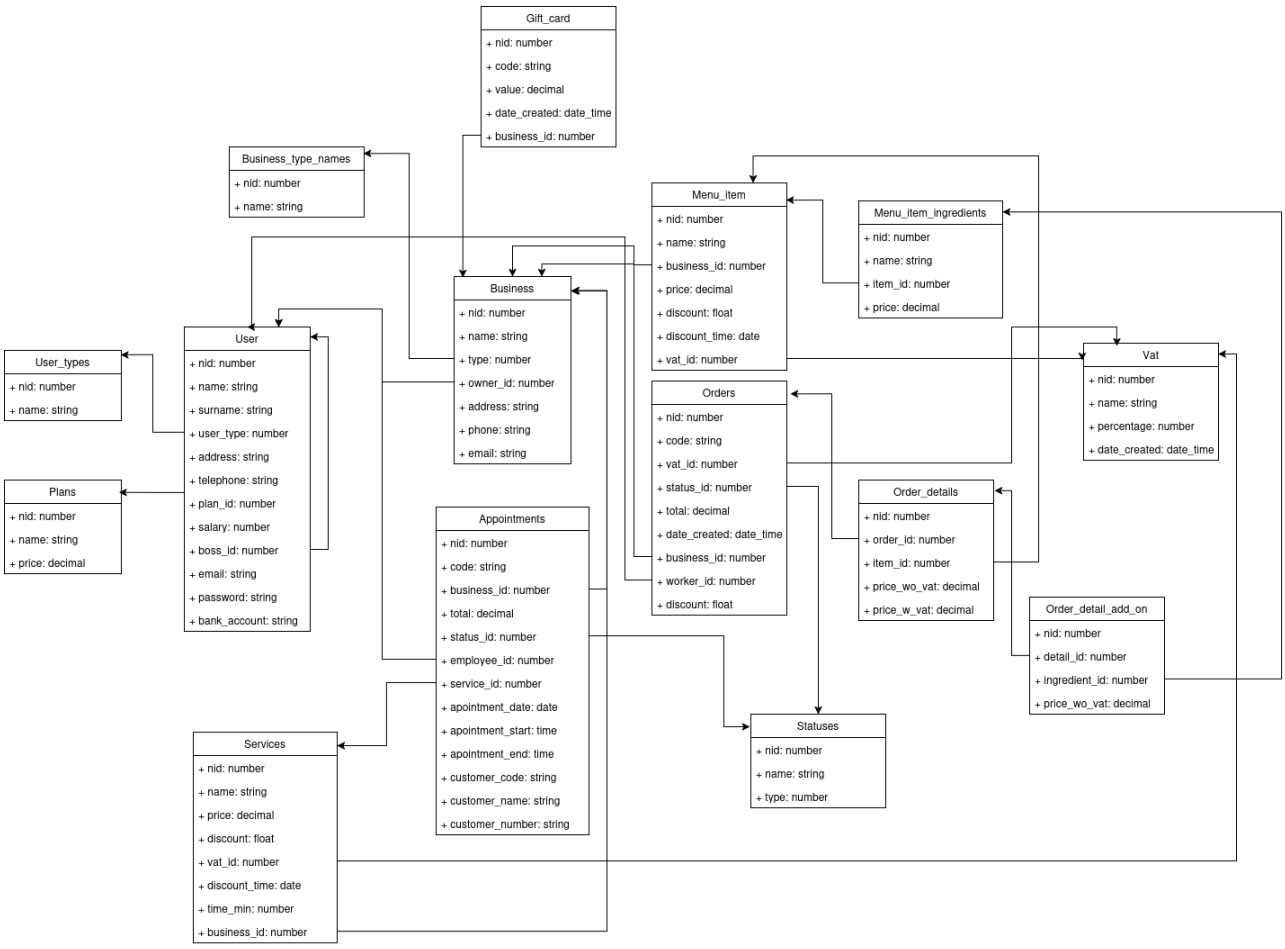
The system architecture is organized into several layers, each responsible for a specific part of the application's functionality. The goal of the project is to modernize how food-service and service-based businesses handle orders, payments, and scheduling.

- **User Interface (UI)** – includes pages for employees, managers, and administrators. Employees use it to handle orders, appointments, and payments. Managers and admins use it to view data, register businesses, and control settings. The UI communicates with the backend through API calls.
- **Backend Entry Point** – acts as the main connection between the UI and the backend logic. It contains the Controller, which handles incoming requests, and CRUD modules, which perform

operations on data. This layer ensures smooth communication between the UI and the internal systems.

- **Identification System** – manages user authentication. It includes a Login System and a Register System to handle secure access for employees and business owners.
- **Calendar System** – manages scheduling by providing a CRUD for appointments, allowing employers to create, view, edit, and delete appointment records.
- **Service System** – handles the services offered by the business, with a CRUD for services used to define and manage what the business provides (e.g. haircut types).
- **Restaurant System** – focuses on foodservice-specific needs, including CRUD for menu and CRUD for additional menu items, which allow restaurants to manage their offerings and extras.
- **Business Management** – provides tools for managing organizations. It includes CRUD for businesses and CRUD for business employers, plus modules for handling Discounts, Giftcards, and Taxes.
- **Payment System** – manages all payment-related features. It includes Payment Integration, Splitting Bill System, and a Discount System, which are connected to both restaurant and business management systems.
- **Information Saving** – represents the database and data handling part of the system. Database Handlers are responsible for saving and retrieving information used by the CRUDs and other backend modules.

4 Data model for entity used in the system



19 figure. *Database class diagram*