



Suleyman Demirel University
Faculty of Engineering and Natural Science

DIPLOMA PROJECT

Trading platform for second hand stores with possibility of organizing online auctions

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5B070400 - "Computing Systems and Software"

Kaskelen, 2022



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Dean of Faculty
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«__» _____ 2022y.

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Abstract

The fashion industry is one of the industries that pollute the environment and is in second place in terms of consumption after water. At the moment, many people are striving for a more environmentally friendly approach to clothing and second-hand stores are a good solution. Also, the concept of second-hand and "vintage" clothing is gaining popularity among the young generation, as it allows you to purchase unique items at an affordable price. In Kazakhstan, this activity is carried out through social networks and there is no integrated online platform with online processes, which complicates the search and purchase of things for buyers and sellers. For this reason, we want to demonstrate an alternative for stores, a trading platform with the ability to put unique items up for auction.

Андатпа

Сән индустриясы ең ластаушы салалардың бірі және судан кейінгі екінші тұтынушы болып табылады. Қазіргі уақытта көптеген адамдар киімге негұрлым тұракты көзқарасқа үмтүлуда, ал секонд хенд дүкендер жақсы шешім болып табылады. Сондай-ақ, секонд хенд және «винтаждық» киім концепциясы өскелец үрпақ арасында танымалдылыққа ие болуда, өйткені ол бірегей заттарды қолжетімді багамен сатып алуға мүмкіндік береді. Қазақстанда бұл қызмет әлеуметтік желі арқылы жүзеге асырылады және онлайн процестері бар бірынғай онлайн платформа жоқ, бұл сатып алушылар мен сатушылар үшін заттарды іздеу мен сатып алууды қыынданады. Осы себепті біз дүкендерге балама, бірегей заттарды аукционга қою мүмкіндігі бар платформаны көрсеткіміз келеді.

Аннотация

Индустрия моды является одной из отраслей, загрязняющих окружающую среду и находится на втором месте по потреблению после воды. На данный момент многие люди стремятся к более экологичному подходу к одежде и хорошим решением служат секонд хенд магазины. Также, концепция секонд хенда и «винтажной» одежды набирает популярность среди молодого поколения, так как позволяет приобретать уникальные вещи по доступной цене. В Казахстане эта деятельность осуществляется через соц. сети и нет объединенной онлайн площадки с онлайн процессами, что усложняет поиск и покупку вещей для покупателей и продавцов. По этой причине, мы хотим продемонстрировать альтернативу для магазинов, торговую платформу с возможностью ставить уникальные вещи на аукцион.

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Chapter 1

Introduction

1.1 Motivation

At the moment, a culture of environmental friendliness and re-consumption of things is gradually being formed in Kazakhstan, and second-hand is one of such cultures. Our main motivation is to contribute to this direction and develop people's conscious approach to buying clothes. If we rely on global statistics, the fashion industry is one of the industries that pollute the environment and is in second place in terms of consumption after water. Over the past 15 years [5], the volume of textile production has doubled. According to Greenpeace, 400,000,000,000 m² of clothing and accessories are produced annually in the world, of which 60,000,000,000 sq.m is thrown away during the year[2].

Also, modern fashion comes to the fact that people want to wear unique and rare clothes that are difficult to find in the mass market. In an ordinary branded store, all clothes meet the fashion standards of the season. And in the second-hand, it is different and has nothing to do with current trends. This attracts many people, because they experiment and create their own style based on personal preferences. Second-hand makes it possible for people to combine fashion and environmental friendliness.

Now there are more than 150 second-hand shops in Almaty and they have a sufficient number of customers. It is becoming a trend to find and wear unique items at an affordable price in second-hand stores. But this is implemented through direct interaction in the store or through social networks (mainly Instagram), which is not convenient at a time when people are used to making purchases online in a couple of clicks. We want to create a single platform for sellers and buyers to make it easier for everyone to purchase and distribute second-hand clothing.

1.2 Aims and Objectives

Our goal is to centralize second-hand stores. To make life easier for both sellers and buyers. Saving them time and power. Because of that, we decided to make

an application to help sellers and customers. So that, it would not only be the target place, it would have a special feature - an auction, so that sellers could make auctions for the items they would consider not usual. And customers would be able to buy the items that they want.

And our objective was to develop a user-friendly web-site with unusual features for our place. We consider to continue to develop this project in the future, so that many other options will be available. We are hoping that our project will be helpful for the people and more convenient for people.

1.3 Thesis Outline

Our thesis contains a total of 5 chapters, where we are explaining every step of our project. The 1st Chapter is Introduction. It says about our motives and goals of our project. The next part is project details. The third part describes project architecture. Chapter 4 is about implementation of the project, what was used, how we used the technologies, etc. Chapter 5 is the conclusion, where summarized all the work that has been done and about future goals of the project.

Chapter 2

Project details

2.1 Research

Before starting the project, we consulted with many people. Since it isn't a simple process to create a web application. After that, we came to the decision to do detailed analysis of our next steps of the project. For that, we divided into several steps:

1. What is our project and its main purpose and what target audience will use the application
2. What features will there be
3. What will we have to do to achieve our goals
4. What technologies will be used

Through the research, we found out the number of people who are interested in this area and approximately how many people will use our application. Because of this, we began to understand how to move on. We took note of what problems might be in the future and began to understand how to implement our project.

The next phase of the project is market analysis. Where each of us should explore other alternatives and describe exactly how their system works, the pros and cons, as well as the errors of the services.

Further, due to the analysis, we decided to make a web-site. Where access will be for all users, regardless of the operating system of the device.

And finally, our goal is to make a good product that will be useful for people. As we said earlier, second-hand shops are very useful for the environment and we hope that our project will be useful for people and it will become more convenient for them to purchase things. Our team aims to develop this project further and will add new features in future.

2.2 Pain points and importance of the project

Initially, when our team was on process of discussion of the project and the main theme. The first pain point was auction-system.

Since there is no such platform in Kazakhstan, it was not entirely clear how to implement the auction and store system at the same time. The solution to this problem was foreign alternative websites. More specifically, eBay. Where the seller enters the initial amount of money and sets the period for which this lot can be bid.

The second pain point. Our problem was to find people who had experience with vintage items, as the second hand in Kazakhstan are not so popular. But we solved this problem in the following way, we started writing to people who were subscribed to the account of vintage stores. Many of them agreed to take the survey, which helped to understand the market situation. And also communicate with some buyers, and found out that the demand for vintage items increased from year to year. Thanks to the survey, we found out that most people are not comfortable looking for things in a standard way, as it takes them a lot of time and effort, but this also applies to store owners. Our main goal is to improve this process by creating a platform that automates this process without changing the fundamental business logic.

2.3 Planning and defining risks

Since every project has its own problems, we decide what method our team should choose, so that our team can quickly sort out the problems.

We needed a method which would help our team work together. Our team was thinking about the most convenient method and also not too hard to work with, since we are just starting our journey in the IT sphere.

Before starting the project, we thought for a long time about which management method is most suitable. Our choice fell into the scrum method.

There are many methods like Agile, Kanban, etc. But for us the most effective was scrum. Scrum is a setting of meeting, planning and tools in a team, that helps to better manage the work in teamwork. Scrum - allows us to adapt to constantly changing conditions of the project. This method has its own artifacts or also called tools. Scrum have 3 solving tools:

- Backlog of project
- Backlog of sprint
- Increment.

As for the juniors, it was the best method for us. Our team had everyday short calls, where every member of the team discussed their progression. And if someone had problems or some misunderstanding, they discussed it with the project manager.

We look forward to implementing more new features in our platform and hope that our project will continue to grow.

Chapter 3

Project Architecture

3.1 Hierarchy of users

Since we have few roles in the web-site. We would like to show you hierarchy of users. (See Figure 3.1).

SecondChance

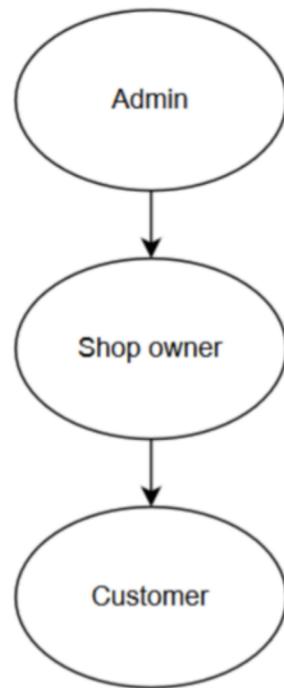


Figure 3.1: User types

3.2 User case diagram

This is a use case diagram, where you can understand how all system users work. In our case, there are three roles - Admin, Shop Owner, Customer. Each of them has their own individual roles that are interconnected. The admin can add or remove shop owners and stores. And in turn, Shop Owners create or delete a store product, and they can also edit products. For example, they can change the time of the auction. Customers can purchase items only after registration. (See Figure 3.2).

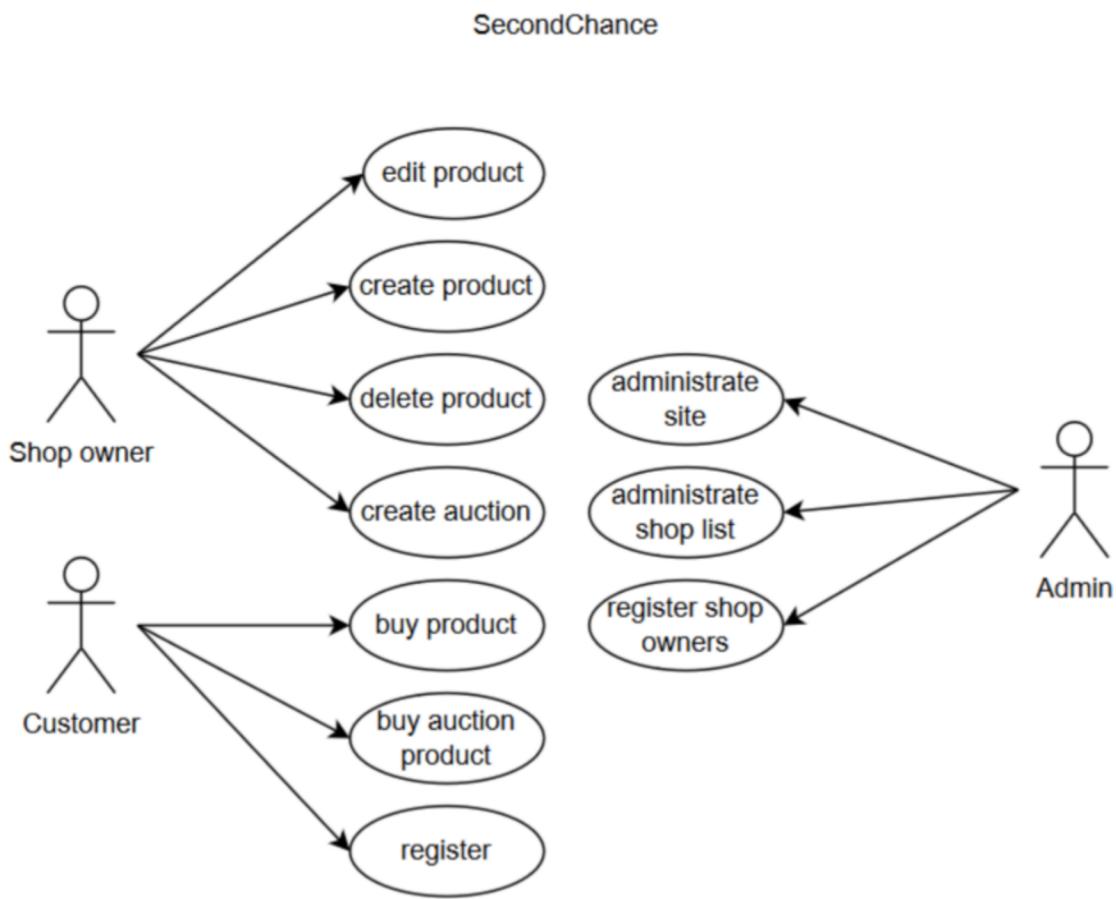


Figure 3.2: User-case diagram

3.3 Activity diagram

The activity diagram describes the actions that are performed on the web-site. Clients should have a registered account to purchase the product. If the client does not have it, he would not be able to buy selected products. Next step is checking if the product is still available or not. If not, the actions will end. When a selected product is available, the next action is payment. Only on condition that the payment goes through, the order is confirmed. If payment does not go through, the process ends without purchasing the product. (See Figure 3.3).

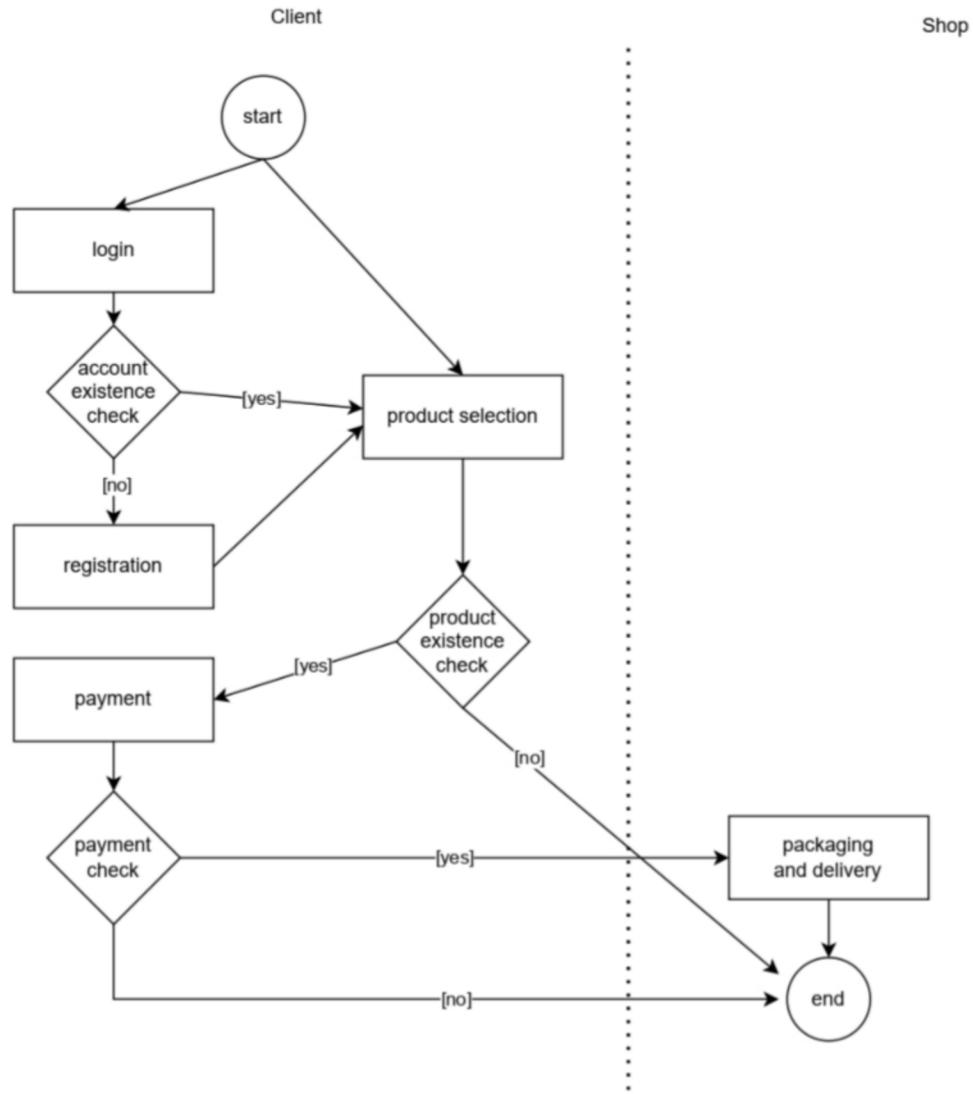


Figure 3.3: Activity-shop diagram

The last diagram was about the shop system. This one shows the functionality of the auction system. (See Figure 3.4).

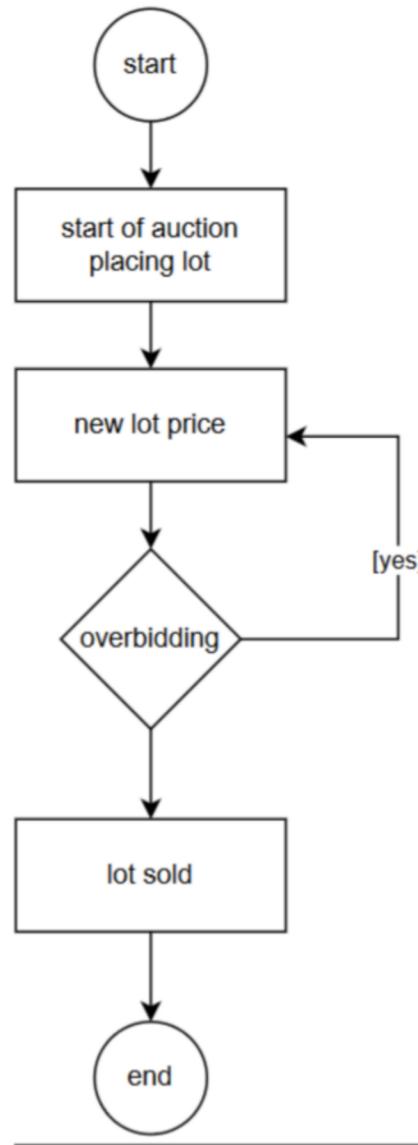


Figure 3.4: Activity-auction diagram

Chapter 4

Implementation

4.1 Design process

UX/UI design is one of the earliest and the most important stages of building a successful project. To make it more conscious and consistent, we started from market and user researches using methods such as survey, analysis of analogues, user stories and user personas. The goal was to answer questions:

- What problem do your users need solving?
- What are their behaviors, needs and motivations? Finally on this stage, we formed two user personas that approximately describe future ordinary users of the website. (See Figure 4.1, 4.2).



User persona
I want fashion to become eco-friendly, and trends to become conscious.

Characteristic
Aida is a woman from Almaty who leads an active lifestyle. Married, mother of one child. In her free time, she likes to go to the mountains and cook. She eats vegetarian food, sorts garbage, leads an eco-friendly lifestyle and shares about it on Instagram blog. Her blog has 45.8 thousand subscribers, the audience also consists of eco-athletes.

Needs

- Buy high-quality clothes without harming the environment.
- Find trusted second-hand stores.
- Поделиться полезной информацией со своей аудиторией.
- Share useful information with your audience.
- Motivate more people to an eco-friendly lifestyle.

Pains and doubts

- It is difficult to find and monitor second-hand stores.
- There are a lot of unconscious and uneconomical purchases among people.
- There are a lot of non-ecological stores.

Aida Temirova
28 years old • Ecoblogger
Positive and active • Nature defender

Figure 4.1: user personas

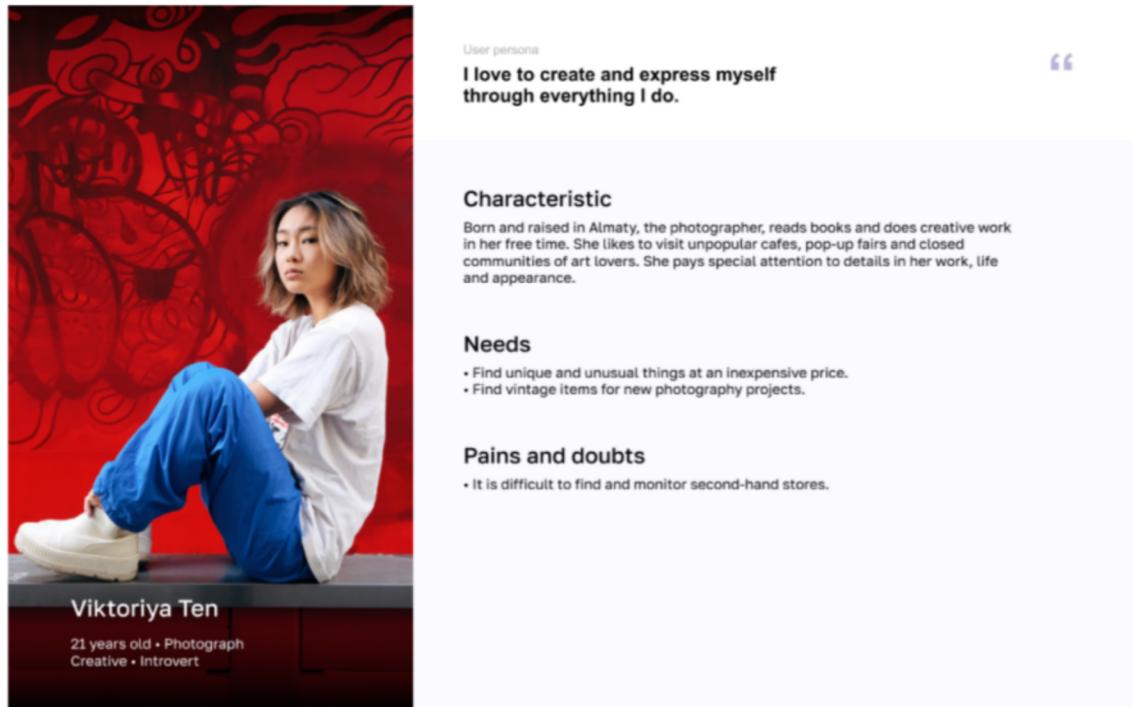


Figure 4.2: user personas

After understanding what aspects should be considered, we moved to the next step: Information Architecture. It's a part of the UX process, where the hierarchy, navigation and structure of the visual part of the website are described. The scheme was constructed on the tool Miro. Design was separated for two roles: customer and shop owner. Website structure for customer consists of:

- Main page (main banner, main categories of products, auction of the day, products with sale, shops)
- Catalog (categories and subcategories, and clothes itself)
- Auctions (clothes on the auction)
- Shops
- Profile (personal information and orders journal) Authorization

While for the shop owner:

- Authorization
- Dashboard (analytics)
- Catalog (Add, delete and edit products)
- Orders
- Shop (Editing information about shop)

The next stage was Designing Wireframes, which started from drawing simple prototypes abstractly showing location of each element and finishing with high fidelity wireframes grouped into flows(Our full design in Appendix A). Figma was the most convenient tool for implementing this task, because it gives opportunity to make work more effective and consistent. (See Figure 4.3,4.4).

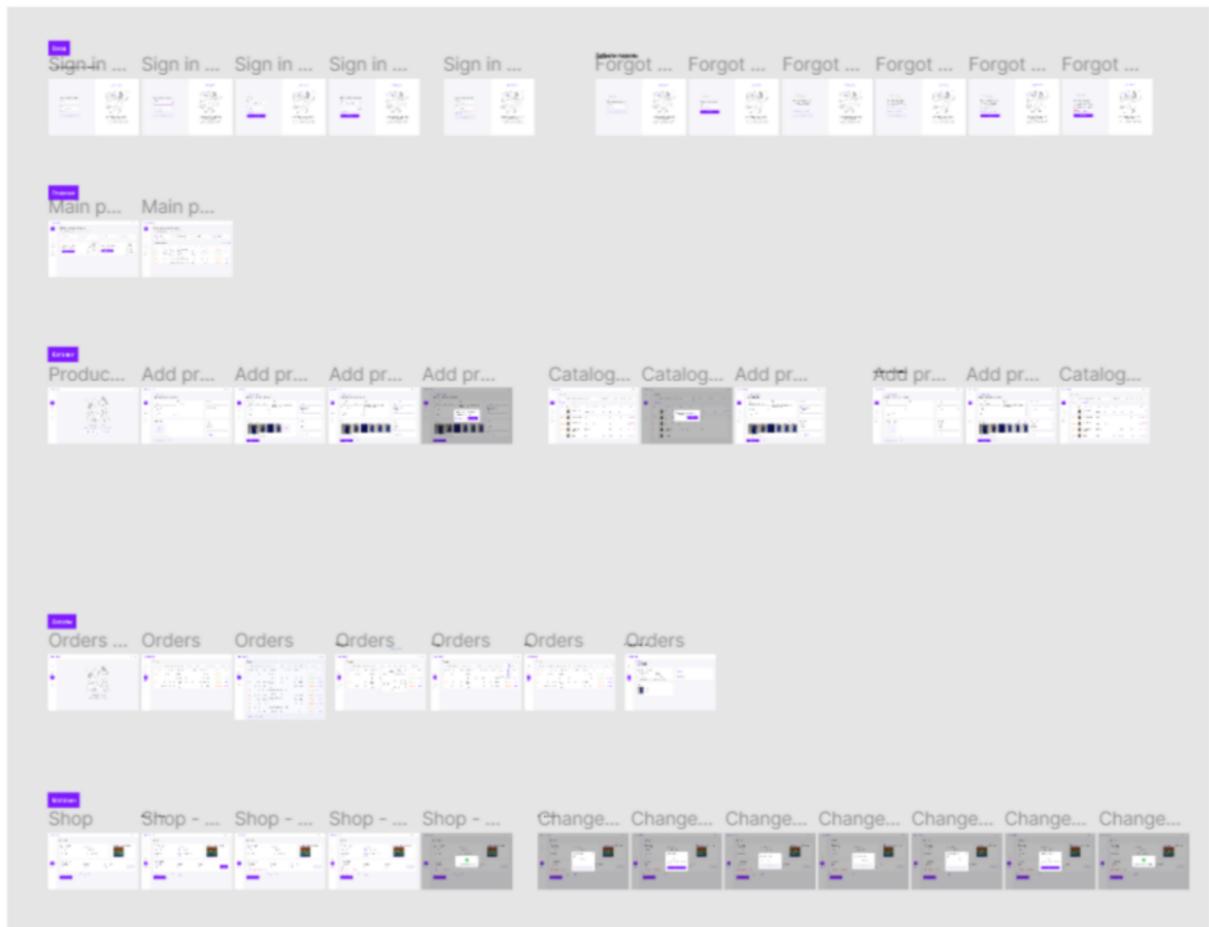


Figure 4.3: Wireframes for shop owner

2ndChance.kz

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Категории

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О платформе

Сервисы платформы
Контакты
Магазины

Авторизация

Регистрация
Войти
Магазины

Figure 4.4: Client main page

4.2 Project database

There are many dbms (database management systems) to raise the database but our choice was postgres[2] because of its great advantages. (See Figure 4.5).



Figure 4.5: Advantages of postgres

However not all the features are used in our project, it is still the most comfortable dbms and for more convenient data management, it was decided to make it remote, due to free service heroku.

Although postgres is nice place to save data[1], in our project there is an auction functionality and using just simple dbms would not be enough to meet the response speed requirements. Therefore we used redis rdbms. Since no/sql languages have an advantage over just sql languages for example data processing speed, scalability, distributed systems

Also to run our web site on a server we used ngrok for its simplicity and convenience As a server we used Raspberry Pi because of its low cost, processing power, linux support, many interfaces like HDMI, multiple USB, Ethernet, onboard Wi-Fi and so on.

4.3 Back-end implementation

In our project, we used the golang programming language for the backend part. Since, golang was created in order to be convenient to use and at the same time be very effective[3]. We also used redis to store the jwt token and the refresh token, as well as to store the prices of the goods for the auction.

You can see the structure of our project. (See Figure 4.6).

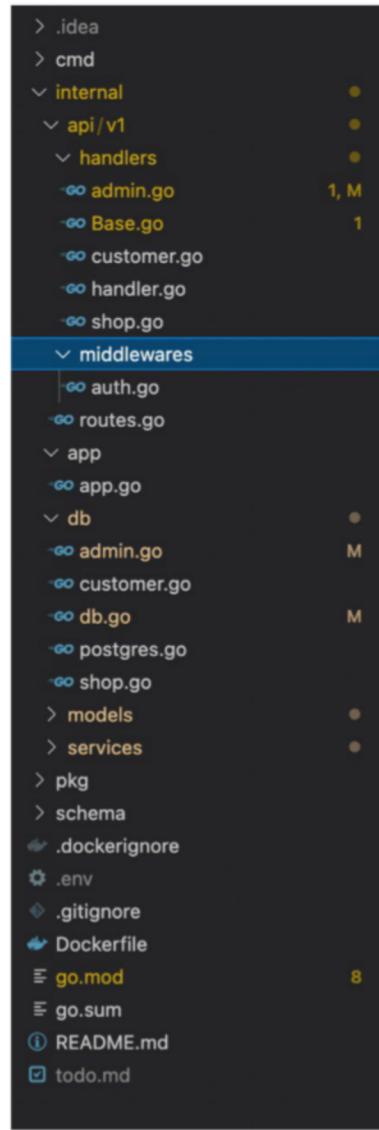


Figure 4.6: Structure of the project

We used a clean architecture, it makes the system easy to learn, simplifies development, deployment on the server, as well as maintenance of the software system. And most importantly, it gives flexibility and the opportunity to continue to have as many options as possible. Handlers provide communication with internal and external layers. (See Figure 4.7). At the service level, we implement business rules, or rather, all cases of using the system. To do this, we use entities

from the model level. The db folder serves as an external layer, it consists of a database and its details In the models folder, we have entities that are defined by business rules and that represent a set of data structures.

```
func Routes(app *fiber.App, h *handlers.Handler) {
    //public service for health check service
    app.Get("/", func(c *fiber.Ctx) error { return c.JSON(fiber.Map{"status": true, "message": "success"}) })

    // Auth
    auth := app.Group("/auth")
    auth.Post("/customer", h.Customer.Login)
    auth.Post("/owner", h.Shop.Login)

    // Admin
    admin := app.Group("/admin")
    admin.Use(basicauth.New(basicauth.Config{Users: map[string]string{"admin": "admin"}}))
    admin.Post("/create", h.Admin.Create)
    admin.Delete("/delete", h.Admin.Delete)
    admin.Get("/get", h.Admin.Get)
    admin.Get("/getall", h.Admin.GetAll)
    admin.Put("/update", h.Admin.Update)
    admin.Post("/saveimage", h.Admin.SaveImage)
    admin.Delete("/deleteimage", h.Admin.DeleteImage)

    // Unauthorized customer
    guest := app.Group("/g")
    guest.Post("/signup", h.Customer.SignUp)
    guest.Get("/get", h.Shop.Get)
    guest.Get("/allproduct", h.Shop.GetAll)

    // Authorized customer
    customer := app.Group("/c")
    customer.Use(middlewares.Protected())
    customer.Get("/buy", h.Customer.Buy)

    // Owner
    owner := app.Group("/owner")
    owner.Use(middlewares.Protected())
    owner.Post("/create", h.Shop.Create)
    owner.Delete("/delete", h.Shop.Delete) // if sell_at is empty
    owner.Get("/get", h.Shop.Get)
    owner.Get("/getall", h.Shop.GetAll)
    owner.Put("/update", h.Shop.Update)
}
```

Figure 4.7: Handlers

4.4 Front-end implementation

This project's user section is for anyone who wants to buy old stuff. Ordinary users do not have access to the administrative section. We have numerous pages in the user section that differ in terms of information and functions. The main page of our site consists of search functions, as well as various information.(See in Figure 4.8)

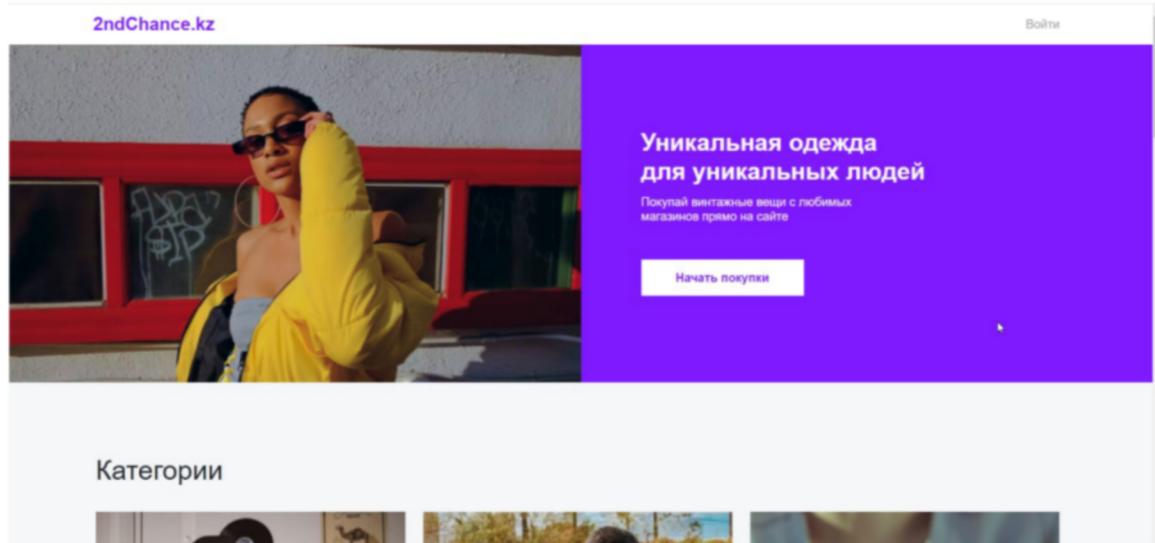


Figure 4.8: Main-page

Such as: categories, discounts of the day, auctions, shops. There are also pages such as a catalog, product details and a payment page. Several libraries were used in the creation of this site, and one of them is the most up-to-date bootstrap library. The entire front-end site was written in react.js. React - JavaScript library, which helps to build UI part. Since, it's flexible and has great performance[4].

The front-end of our website consists of two parts, admin and client. The admin part is for second hand stores that display their products. This part helps sellers to lay out their goods. And the second is the client part, this is for users and buyers. So, the whole design was written in react.js, so it is connected to the golang backend.

Chapter 5

Conclusion

The aim of the project was to develop a user friendly and easy platform that considers pain points and preferences of both customers and second hand shop owners. Also we wanted to innovate the auction system in buying and selling clothes. Realizing that market and user needs and problems will be solved we developed this project. In the future, we believe that with the help of this product we will improve the culture of conscious consumption of clothing, and ease life of second hand shop customers and sellers.

Appendix A

Design part

The screenshot shows the main dashboard of the 2ndChance.kz platform. At the top, it says "Добро пожаловать, Shopname". Below that, there's a message: "Здесь вы можете пополнить и редактировать каталог, управлять заказами и данными магазина". On the left, there are two navigation sections: "Каталог" and "Магазин". The "Каталог" section has a purple icon and the text "Главная". The "Магазин" section has a green icon and the text "Заказы". In the center, there are four summary boxes: "Покупателей" (456), "Заработка за месяц" (112 900 ₸), "заказов за месяц" (23), and "товаров в каталоге" (156). Below these, there's a table titled "Последние заказы" (Recent orders) with five rows of data. The columns are: Номер заказа (Order number), Дата (Date), Тип заказа (Order type), Название товара (Product name), Сумма товара (Product price), Покупатель (Buyer), Статус (Status), and Действия (Actions). The data in the table is as follows:

Номер заказа	Дата	Тип заказа	Название товара	Сумма товара	Покупатель	Статус	Действия
#0011	23/12/2021	Аукционный	Бархатное платье с открытой спинкой	5 990 ₸	Айганим Аманбаева	Оплачено	Посмотреть
#0010	23/12/2021	Стандартный	Бархатное платье с открытой спинкой	5 990 ₸	Айганим Аманбаева	Выдан	Посмотреть
#0009	23/12/2021	Стандартный	Бархатное платье с открытой спинкой	5 990 ₸	Айганим Аманбаева	Оплачено	Посмотреть
#0008	23/12/2021	Стандартный	Бархатное платье с открытой спинкой	5 990 ₸	Айганим Аманбаева	Оплачено	Посмотреть

Figure A.1: Main page

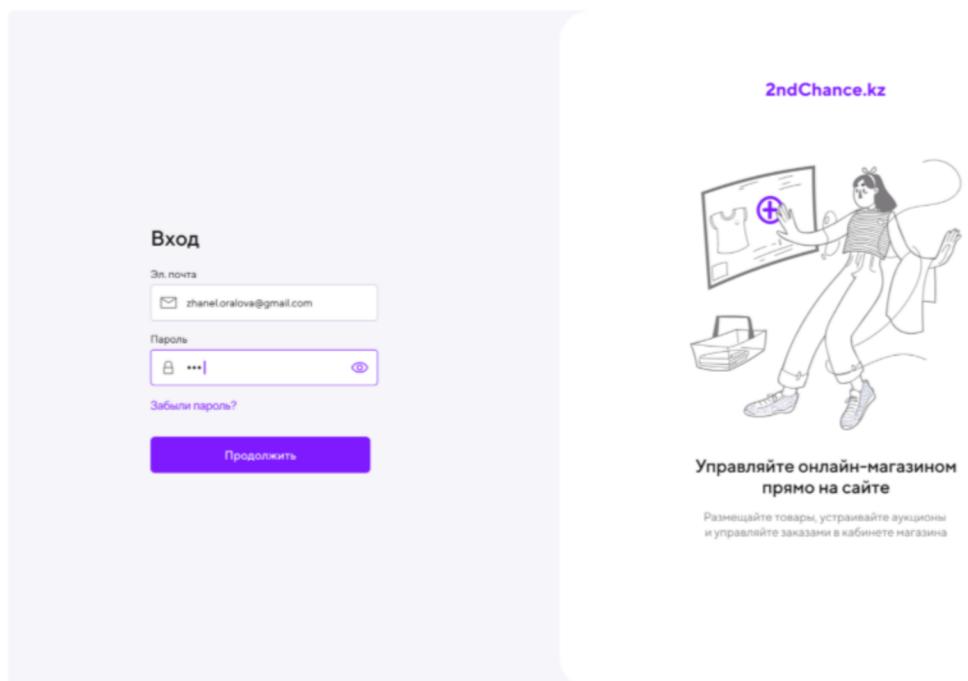


Figure A.2: Sign in page

The catalog page for 2ndChance.kz shows a list of five identical items. The sidebar on the left has icons for "Главная" (Home), "Каталог" (Catalog) with a selected purple square, "Заказы" (Orders), and "Магазин" (Store). The main area has a header "Заказы" (Orders) with a search bar and dropdown menus for "Все категории" (All categories), "Все подкатегории" (All subcategories), and "Цена" (Price). Below this is a table with columns: Номер (Number), Фото (Photo), Название товара (Product name), Категория (Category), Подкатегория (Subcategory), Размер (Size), Цвет (Color), Цена (Price), and Действия (Actions). Each item in the table is labeled "#0011" and shows a photo of a black double-breasted coat with buttons. The details for each item are: Пальто двубортное на пуговицах (Double-breasted coat with buttons), Женщинам (Women), Платье (Dress), S, Черный (Black), 15 990 ₸, and three action icons (edit, delete, etc.).

Figure A.3: Catalog page

2ndChance.kz

← Вернуться к каталогу

Добавить аукционный товар

Название товара
Введите

Описание
Введите подробное описание товара

Минимальная ставка
Введите

Категория товара
Введите

Подкатегория товара
Введите

Дата окончания аукциона
Выберите дату

Фотографии товара
Главное фото
Вы можете загрузить 7 фотографий товара

Размер товара
Стандарт

Цвет товара
Введите

Состояние
Новый Б/У

Сохранить Отмена

Figure A.4: Add product page

2ndChance.kz

← Вернуться к заказам

Заказ #0011

Информация о заказе и покупателе

Дата поступления заказа: 12.02.2022, 12:34

ФИО покупателя: Оралова Жанель

Эл. почта покупателя: zhanel.oralova@gmail.com

Срок выдачи заказа: 3 дня (до 15 февраля 2022)

Сумма заказа: **5 990 ₸**

Поменяйте статус заказа на Выдан, если покупатель уже забрал заказ

Оплачено

Информация о товаре

Название товара: Бархатное платье с открытой спинкой
Размер товара: XS - S

Figure A.5: Orders page

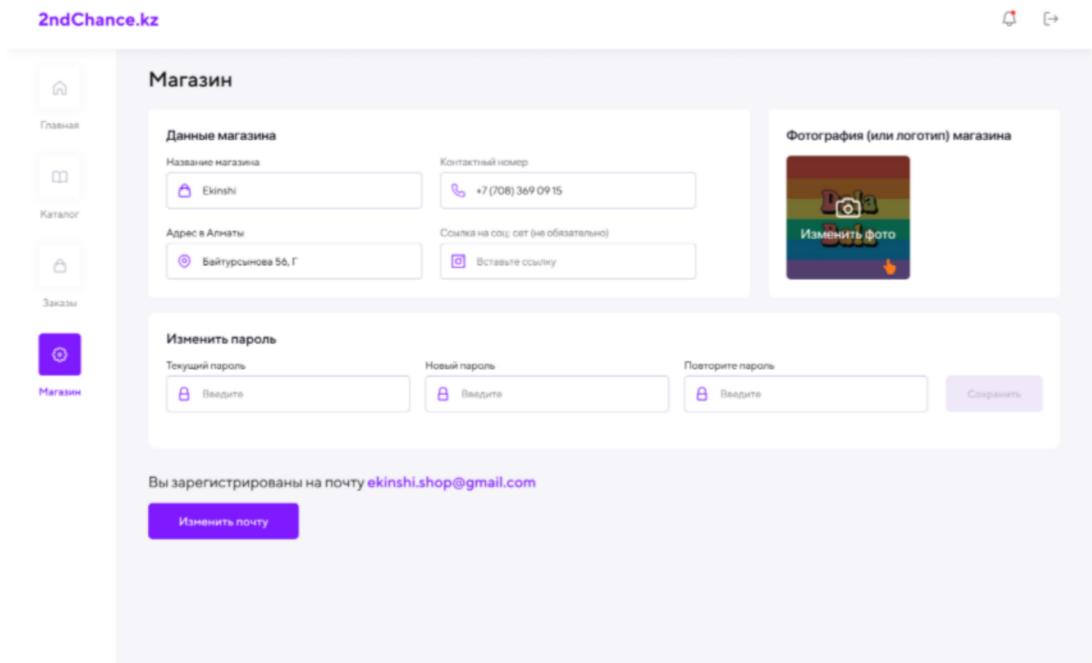


Figure A.6: Shop page

References

- [1] *All about PostgreSQL*. URL: <https://www.postgresql.org/about/>.
- [2] *Fast fashion is “drowning” the world. We need a Fashion Revolution!* URL: <https://www.greenpeace.org/international/story/7539/fast-fashion-is-drowning-the-world-we-need-a-fashion-revolution/>.
- [3] Martin Helmich Mina Andrawos. *Cloud Native Programming with Golang: Develop microservice-based high performance web apps for the cloud with Go*. Packt Publishing, 2017.
- [4] *What is React JS?* URL: <https://skillcrush.com/blog/what-is-react-js/#used>.
- [5] *Секонд-хенды: выгодно, экологично и безопасно*. URL: <https://style.rbc.ru/health/5dcbbde39a794734286061f4>.