Ministry of Education and Science of the Republic of Kazakhstan
Suleyman Demirel University

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Restaurant Reservation

A thesis submitted for the degree of
Bachelor in Information Systems, Computer Systems and Software
(degree code: 5B070300,5B070400)

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Abstract

More recently, most restaurants and establishments in the world have started deploying software applications across a variety of media and hospitality sectors. As mobile technology and smartphones continue to evolve and permeate all aspects of life, becoming more convenient and popular, restaurateurs have new opportunities to use these innovations to attract tourists. In their use, the following advantages can be distinguished: convenience, accessibility, automation of processes, independence, ease of memorization. However, not all countries keep pace with innovation in the technology world. The current crisis motivates society to switch to online platforms. In previous years, the market in this area showed the opposite of global trends, despite the fact that most citizens have access to the global network.

Analysis of the online services industry in Kazakhstan shows that it is at an underdeveloped level and domestic projects need to improve many aspects of their platforms to be competitive on a global scale. Analogs of sites from the CIS countries provide good information on programming with a more convenient interface. All these arguments served as the main reason for the creation of a platform, website and mobile application of domestic production.

Nowadays, websites are becoming an integral part of our life. A website is a tool that you can use to attract leads and optimize the initial ordering process for your services. Having a good web page immediately increases your credibility. With a well thought out and organized website, you will be able to make the right impression on your business partner. Potential clients can view your business on your web page and get acquainted with your services and may become your clients in the future.

For programmers, website development is a great opportunity to demonstrate their skills. When performing their tasks, programmers use different programming languages and platforms. Developers go to great lengths to create a structured, fast and functional website with a user-friendly interface.

Depending on the facts listed above, there was an idea to make the project like a website for reserving tables in restaurants. The website is designed so that customers can make reservations at their favorite restaurants without having to wait in kilometer-long lines. All possible services were taken into account so that it was convenient not only for customers, but also for restaurants. The development of any application requires careful planning. In this thesis, in the process of creating a platform, an alternative way will be proposed: a website with a user-friendly interface and accessible material.

The purpose of the thesis is to make life easier for people in terms of saving time and energy, to interest restaurateurs and build a convenient platform for them, thereby raising the market in this area to a new level. All this can be viewed in detail in the project documentation.

Аңдатпа

Жақында әлемдегі мейрамханалар мен мекемелердің көпшілігі бұқаралық ақпарат құралдары мен қонақжайлылықтың әртүрлі салаларында бағдарламалық жасақтама орналастыруды бастады. Мобильді технологиялар мен смартфондар дамып, өмірдің барлық аспектілеріне еніп, ыңғайлы әрі танымал бола бастағандықтан, рестораторлар бұл жаңалықтарды туристерді тарту үшін пайдаланудың жаңа мүмкіндіктеріне ие. Оларды қолдануда келесі артықшылықтарды ажыратуға болады: ыңғайлылық, қол жетімділік, процестерді автоматтандыру, дербестік, есте сақтаудың қарапайымдылығы. Алайда, барлық елдер технологиялық әлемдегі инновацияларға ілесе бермейді. Қазіргі дағдарыс қоғамды онлайн-платформаларға ауысуға итермелейді. Алдыңғы жылдары бұл саладағы нарық жаһандық тенденциялардың керісінше екендігін көрсетті, дегенмен азаматтардың көпшілігі ғаламдық желіге қол жеткізді.

Қазақстандағы онлайн-қызметтер саласын талдау оның дамымаған деңгейде екенін көрсетеді және отандық жобалар әлемдік масштабта бәсекеге қабілетті болу үшін платформаларының көптеген аспектілерін жетілдіруі керек. ТМД елдерінің сайттарының аналогтары ыңғайлы интерфейспен бағдарламалау туралы жақсы ақпарат береді. Барлық осы дәлелдер отандық өндірістің платформасын, веб-сайтын және мобильді қосымшасын құрудың негізгі себебі болды.

Қазіргі уақытта веб-сайттар біздің өміріміздің ажырамас бөлігіне айналуда. Веб-сайт - бұл сіз өзіңіздің қызметтеріңізге тапсырыс беру процедураларын оңтайландыру және оңтайландыру үшін пайдалана алатын құрал. Жақсы веб-сайттың болуы сіздің сенімділігіңізді бірден арттырады. Жақсы ойластырылған және жүйеленген веб-сайттың көмегімен сіз өзіңіздің бизнес серіктесіңізге дұрыс әсер ете аласыз. Потенциалды клиенттер сіздің сайтыңызды сіздің веб-сайтыңыздан көре алады және сіздің қызметтеріңізбен танысады және болашақта сіздің клиенттеріңізге айналуы мүмкін.

Бағдарламашылар үшін веб-сайтты құру - бұл өз дағдыларын көрсетуге тамаша мүмкіндік. Тапсырмаларды орындау кезінде бағдарламашылар әртүрлі бағдарламалау тілдері мен платформаларын қолданады. Әзірлеушілер ыңғайлы интерфейсі бар құрылымдалған, жылдам және функционалды веб-сайтты құру үшін көп күш жұмсайды. Жоғарыда келтірілген фактілерге байланысты, жобаны мейрамханалардағы үстелдерді брондауға арналған веб-сайт тәрізді етіп жасау идеясы болды. Веб-сайт клиенттерге өздерінің сүйікті мейрамханаларында брондауды бірнеше шақырымға созылмай жасай алатындай етіп жасалған. Клиенттерге ғана емес, мейрамханаларға да ыңғайлы болу үшін барлық мүмкін қызметтер ескерілді. Кез-келген қосымшаның дамуы мұқият жоспарлауды қажет етеді. Бұл тезисте платформаны құру барысында альтернативті әдіс ұсынылады: ыңғайлы интерфейсі және қол жетімді

материалы бар веб-сайт.

Дипломдық жұмыстың мақсаты - уақыт пен энергияны үнемдеу бойынша адамдардың өмірін жеңілдету, рестораторларды қызықтыру және оларға ыңғайлы алаң құру, сол арқылы осы саладағы нарықты жаңа деңгейге көтеру. Мұның бәрін жобалық құжаттамада егжей-тегжейлі қарауға болады.

Аннотация

С недавних времен большинство ресторанов и заведении мира начали развертывать программные приложения в различных медиа и гостевых секторах. Поскольку мобильные технологии и смартфоны продолжают развиваться и пронизывать все стороны жизни, становясь все более удобными и популярными, у рестораторов появляются новые возможности использовать эти инновации для привлечения туристов. В их использовании можно выделить следующие преимущества: удобство, доступность, автоматизация процессов, самостоятельность, легкость в запоминании. Однако не все страны идут в ногу с инновациями в мире технологии. Ситуация с современными кризисом мотивирует общество переходить на онлаин платформы. В предыдущах годах рынок в этои сфере показывал обратное мировым тенденциям, не смотря на то что у большинства граждан имеется доступ к мировои сети.

Анализ сферы онлаин услуг в Казахстане показывает, что он находится на недостаточно развитом уровне и отечественным проектам следует улучшить многие аспекты в своих платформах для конкурентоспособности в мировых масштабах. Аналоги саитов из стран СНГ, предоставляют хорошую информацию по програм- мированию с более удобным интерфеисом. Все эти доводы послужили основнои причинои для создания платформы, саита и мобильного приложения отечественного производства. В настоящее время веб-сайты становятся неотъемлемой частью нашей жизни. Веб-сайт - это инструмент, который вы можете использовать для привлечения потенциальных клиентов и оптимизации процесса первоначального заказа ваших услуг. Наличие хорошей веб-страницы сразу увеличивает ваш авторитет. Благодаря хорошо продуманному и организованному веб-сайту вы сможете произвести правильное впечатление на своего делового партнера. Потенциальные клиенты могут просмотреть ваш бизнес на вашей веб-странице и познакомиться с вашими услугами и могут стать вашими клиентами в будущем.

Для программистов разработка сайтов - отличная возможность продемонстрировать свои навыки. При выполнении своих задач программисты используют разные языки программирования и платформы. Для создания структурированного, быстрого и функционального веб-сайта с удобным интерфейсом, разработчики проделывают огромную работу. В зависимости от перечисленных выше фактов, была идея сделать проект, как сайт для бронирования столиков в ресторанах. Веб-страница разработана таким образом, чтобы клиенты могли бронировать столики в своих любимых ресторанах, не дожидаясь километровых очередей. Были учтены все возможные услуги, чтобы это было удобно не только клиентам, но и ресторанам. Разработка любого приложения требует тщательного планирования. В даннои дипломнои работе в процессе создания платформы будут пред- ложен альтернативый способ: веб-сайт с удобный интерфейсом и доступный материалом.

Цель дипломнои работы - упростить жизнь людям в плане экономии времени и энергии, заинтересовать рестораторов и построить для них удобную платформу тем самым поднять рынок в этой сфере на новый уровень. Обо всем этом можно подробно посмотреть документации проекта.

Contents

Chapter 1

Introduction

1.1 Theoretical aspects of investigation

The success of a restaurant's operations depends on many factors, ranging from formulating a general philosophy of running this business to monitoring how this philosophy is actually implemented. Given the many phenomena associated with this activity, it is very difficult to succeed in it. In addition, the restaurant plays a very important role in human life. Recently, the pandemic and quarantine measures have made their changes. This world began to dictate its own rules. People have changed their values and perceptions of some things. This is an opportunity to demonstrate the full power of digital and technology. Getting used to online technologies, people quickly began to master this sector, thereby giving a great incentive to automation. The restaurant business also needed digital help to maintain its place in the competitive market. Many services in this area have begun to move into the world of digital. But one of these services that needs constant development is, of course, the service of booking tables. Hence the idea of making this service more convenient and accessible for all residents of our country, so that everyone has the opportunity, without leaving home, as is customary now, to make a reservation and order the menu.

1.2 Overview

Restaurants play a rather important role in human life. In addition to satisfying physiological nutritional needs, "going out" to a restaurant has an important social function. A person needs not only to eat, but also to communicate. Restaurants are one of the few places where all the senses work to generate an overall sense of satisfaction. Taste, sight, smell, tactile sensations are combined in the evaluation of food, service and atmosphere of the restaurant. The efficient operation of a restaurant depends on several factors. Like any complex system, a restaurant begins with the idea of its founders and ends with the control over the functioning

of the institution. The main role in this is played by the practical philosophy of its owner and/or director. It reveals an approach to doing business, which defines ethical and moral values that are implemented in the process of enterprise functioning. The main idea of the founders of the restaurant will determine its credo, and is designed to satisfy visitors as much as possible.

1.3 Motivation

The success of any business depends not least on the qualifications of the company's personnel, their skills and the desire to work productively. The restaurant business is different from all other types of business. This is an enterprise that combines art and tradition, mechanisms of activity and experience of marketers, service philosophy and the concept of building a potential audience. The restaurant business is developing rapidly from year to year. There is a serious competition for visitors. It is this factor that makes top managers think over not only the main strategy and style of the restaurant's activity, but also the details that make the establishment unique and inimitable. Only with the formation of a well-developed concept and consistent integrated implementation of all components of the restaurant business, success in the development of the restaurant's activities is guaranteed.

The aim of this work is to improve and expand the list of restaurant services and bring them to a new level.

1.4 Aims and objectives

During the discussion of business processes with representatives of restaurants, it became clear why attempts to translate this conservative sphere into modern communication methods are failing. A critical mass of participants interested in each other is needed. While application users can easily be interested in various features, then a restaurant is a pure business. Fashionable image solutions for him are not even in second place after profitability, because they do not bring new guests.

In order to build a system that would be interesting for both of them to join, the idea came up to work out a concept in which both parties benefit. The concept assumes that the platform for guests will have three main functions:

1. Search for an institution by criteria: events that take place there, promotions, discounts, menu updates, online table reservations.

2. Displaying the restaurant menu, sending the order to the waiter and paying the bill online.

3. Notifications about new events in the restaurant life of the city, much like news in Telegram channels.

If the attractiveness of the application for guests is mainly determined by these chips, then restaurants are not interested in the application itself, but in the consequences of the fact that guests will use it:

1. Precise targeting of highly relevant guests and the implementation of conditional discounts to attract new ones.

2. Increase the average check by profiling guests.

3. Savings on equipment and its maintenance with an electronic menu.

4. Elimination of intermediaries when booking tables.

5. Prevention of financial fraud of personnel when using discount and accumulative cards.

The idea behind this project is to save restaurant guests from unnecessary waiting when they book a table and are looking for a waiter to place an order or pay. Against the background of the total automation of the restaurant's internal processes, interaction with guests has not made much progress. There are websites and apps for reading reviews, calls or emails for table reservations, greeting letters and invitations, banner ads on social networks, and PR campaigns in offline media.

1.5 Thesis Outline

The first chapter is Introduction chapter. It is this one that you are currently reading. It contains general information about restaurant reservation and explanation about how it was decided to create a website for it. It gives insight into the work done. In Chapter 2 we review related work and formulate the problem to solve. Chapter 3 is describing the solution to the problem. And in Conclusion chapter we conclude our conclusion.

Chapter 2

Methodology

2.1 Agile methodology

To implement a successful project, it is necessary to correctly define responsibilities and plan all stages of development. Thus, increasing the efficiency of work.

Nowadays, there are many agile methodologies that are used in development of the project. It has been suggested that agile methodologies provide the safest way in multiple stages of applications development. Studies have been conducted to adapt the agile architecture to the project that show the need of methodology methods in applications. As with any job decision, the optimal way to choose the best agile methodology if you consider all options first. In the development of this project, it was considered to use Scrum methodology. There are several reasons to use scrum in development of website:

- **Responding to customer needs**

  Scrum uses fixed length iterations called sprints. For development this diploma each sprint took for 1-2 weeks. By working in short and frequent cycles, projects can provide results to customers almost on demand. Developers are able to quickly adapt to new requirements or easily change the concept of requirements, due to using scrum, each stage of the development process is tested and can make additional technical specifications if necessary. In addition, new features can also be added not twice a year, but much more often, thus bringing in more customers and processing their special requests faster.

- **Reduced risks**

  As it is written above developers are testing their work in each sprint and scrum allows you to identify issues in the later stages from the origin or at the initial stages. Furthermore, programs that are written by developers are

tested by developers themselves. This leads to the fact that the problems are found quickly and checked in all stages.

- **Enhanced productivity**

  Through teamwork, team members work in a sequence by target indicators, which allows them to fulfill all obligations in the specified period.

2.2   Statistics and survey

Currently, most cases or jobs are not created without data analysis and audience research. In the current project, surveys have been created and the results are presented on the topics of the restaurant business.

Throughout the period, thorough surveys were carried out with the aim of deriving audience data. Below is a survey that the majority of people who have completed the survey are women.
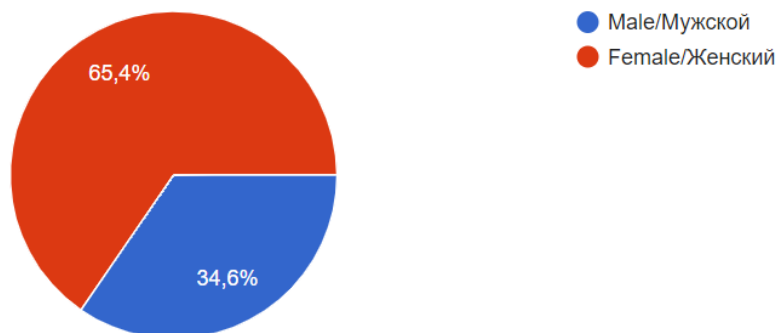

Figure 2.1: Your gender

Further, the category and age of people was determined. Most of the audience is aged 45 and more.

In order to recognize the attendance of restaurants, several types of attendance were identified. The rarity of visits to say that people need online booking and in some cases the reason is the refusal to wait in line.

Below are examples of how people perceive the word cafe or restaurant.
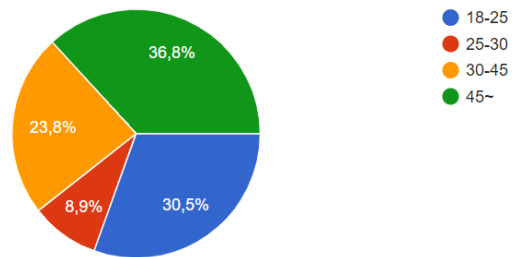
How old are you? Сколько вам лет?

269 ответов

Figure 2.2:

How often do you go to restaurants? Как часто вы ходите в рестораны?
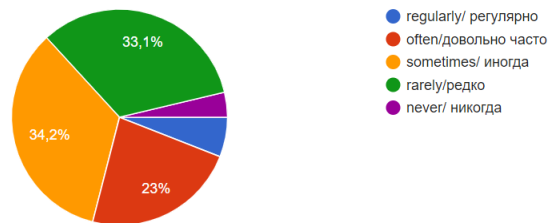
269 ответов

Figure 2.3: Colors oject.

What time do you most often visit a cafe / restaurant? /В какое время вы чаще всего посещаете кафе/ресторан
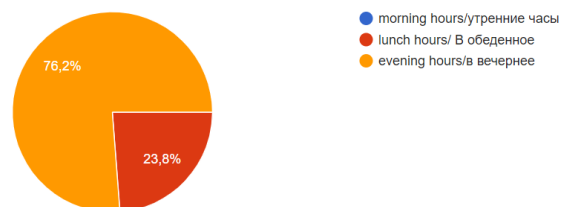
269 ответов

Figure 2.4: Coject.

Chapter 3

Development process

The most important thing in any project is the plan of the development process. First of all, the idea of the thesis is decided, the aim of the purpose must be approved by the entire team, because it is difficult to work efficiently on something you do not like. When all aspects of the project idea are solved, the development tools are chosen.

3.1 Development tools

All tools that are used to create this project are written in the following sections.

3.2 Programming

In order to start coding, developers must determine the coding language and platform for development. As we all know the site backend side and frontend side. Frontend is the client side of the user interface in relation to the software and the hardware of the service. In simple words, frontend is what the clients see while opening any webpage. A lot of work is done by frontend developers, UX-UI designers to create a user friendly product. Backend of the site is responsible for the functionality and logic of the website. In other words, backend is the process of connecting client to server. There are a lot of programming languages used to construct a good web page. In this thesis all used tools and coding languages are shown in next sections.
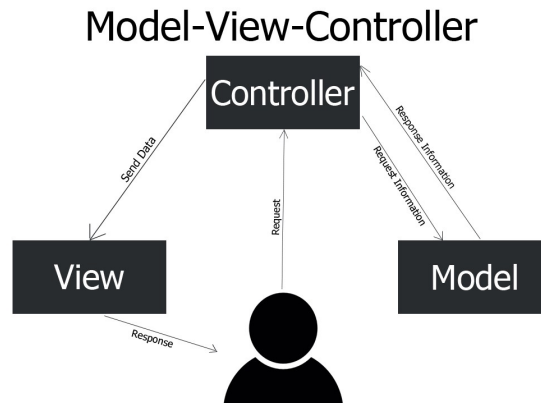
3.2.1 MVC

MVC is a programming pattern that allows you to split your application logic into three parts:

Model Receives data from the controller, performs the necessary operations and transfers them to the view.

View Receives data from the model and displays it for the user.

Controller Processes user actions, validates the received data and passes it to the model.
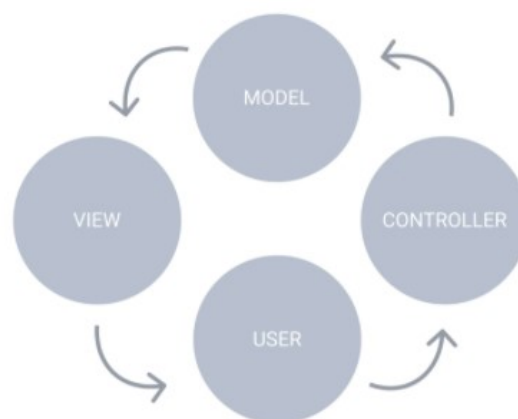

3.2.2 MVC process

To understand the concept of MVC, you need to disassemble it with an easy example - a restaurant with food. In it, customers (users) come to the cashier (both the view and the controller), see the menu and order some kind of dish. Next, the cashier checks if everything is in order with the order, and after payment transfers the necessary data to the chef (model). The chef prepares the ordered dish, although he has no idea what the visitor looks like, whether he paid for the order, and so on. When the model finishes its work, it will send the result to the view - back to the cashier, who, in turn, will give the finished dish to the client. If we talk about applications, then the components will be as follows:

View - interface.

Controller - a handler for events initiated by the user (clicking on a button, following a link, submitting a form).

Model - is a method that is launched by the handler and performs all basic operations (retrieving records from the database, performing calculations).

3.2.3   Why we use MVC?

This design pattern is needed to separate logical parts of the application and create them separately from each other. That is, write independent blocks of code that you can change as you like without affecting others.

For example, so that you can rewrite the way data is handled without changing the way it is displayed. This allows several programmers to work efficiently - each one deals with his own component. At the same time, the developer does not need to delve into someone else's code and his actions will not affect other parts of the application in any way.

At first glance, MVC may seem complicated, but the more effort you put into learning it, the clearer it will be why many developers prefer it. Especially if you compare it with conventional development, where event handlers are responsible for everything.

3.3   Java Spring Boot

While creating any project for developers, an understanding of the project is first important, this is called architecture. After all, this is a very important part, since you will need to choose the right tools for the implementation of the project. This project uses the Java Spring Boot framework. Spring Boot is a great platform for developers. Java for developing a standalone and productive spring app that you can just run. You can get started with minimal settings without the need for a full Spring configuration.

As for this project, all the requirements that have been specified are suitable for this framework, thereby giving us the opportunity to simplify it. Benefits of Spring for its developers:
1. Easy to understand and develop spring apps
2. Increases productivity
3. Shrinks development time

It also offers a flexible way to customize Java Beans, XML configuration, and database transactions. In addition, it provides powerful batch processing and manages REST endpoints. In the spring boot, everything is configured automatically; no manual adjustments are required. It also makes dependency management easier and includes a built-in servlet container.

3.3.1   Authentication and Registration with Spring Security and Nuxt Auth

As we all know, shopping and booking websites need a registration page, and of course , the authorization page must be secure. For this purpose, it was chosen

to use Spring Security for the backend side. It is a framework that is focused on authentication and authorization on Java applications. Furthermore, Spring Security can be easily extended according to your functionality. That's why Spring Security is considered one of the powerful security tools and used in most API servers. In order to authenticate and get user data from backend and frontend JSON Web Token(JWT) is used. In simple words, JWT is a kind of connection between front and back. Token is a string that is automatically generated in HMAC SHA256 form to provide secure connection. It is saved in cookies in the user's web browser and used to make authorized requests to the server.

To get a token from the backend to the front axios is used. Axios is a service that is used to get responses from the backend side. After getting a token using axios, log in, log out , refresh functions can be written or you may use Nuxt Auth. In this case, Nuxt Auth is decided to be in use, because it optimizes your code. Using Nuxt gives the opportunity to send requests to the server side by setting up endpoints. Responses that were retrieved from the server can be stored in cookies or local storage of the browser. To be more secure all responses are stored in local.

3.3.2   Hibernate and JPA

Modern design is full of various frameworks , applications to make life easier. As the previous section written, database storage is one of the main functionality of the backend side. Hibernate is the framework that is used to connect data from databases with OOP. Working with Hibernate reduces time that could be spent while using regular jdbc. This is because Hibernate automatically creates connections between your code and database, and each created entity in the back side automatically converts to the tables in the databases. Joins between tables in the database can also be automatically created. Furthermore, foreign keys between tables are also generated by Hibernate.

After the creation of CRUD for entities, for retrieving data,updating and changing them Spring JPA is used. JPA is a mechanism that is used to interact with database entities. In our case, we have created repositories for entities and implemented some methods in it.

3.3.3   Stripe Api

Stripe is a cloud-based[] service that is used for secure Internet payments using plastic cards. In simple terms, stripe acts as an intermediary between the buyer and the seller that makes a secure payment in terms of information security. All problems with card payment, card storage, bank payments , etc. are handled by Stripe. So it means that you will not worry about card details, instead you use token authentication for making payment. On the coding side you have to

implement @Controller for payment and @EntityClass how payment should be created. The main important thing in implementation of stripe in your project is Public and secret keys that are provided by the server. In order to get them, you have to log in stripe.com and create your own page on the server. After that in the developers page you can get your keys for making transactions and save them in your application.properties file.

3.4   Construction of wireframe

While creating any project, everyone involved: developers, designers, managers need well-structured wireframes. Consider wireframes as the skeleton of your design that must represent all important elements of your final product. Wireframes are not detailed design of application, however, on the other hand, wireframes create a coherent representation of the final design, without missing any significant element. While looking at wireframes, everyone should clearly understand the complexity of the project and evaluate the planning. A good wireframe is the heart of a clean design and defines the direction of work for the entire team.

Wireframes can be used as project documentation, since they demonstrate interaction of the user with the interface in separate static moments. Furthermore, wireframes are accompanied by textual comments, both brief explanations and complex technical documentation, if needed.

The next step in design of the project is mock-ups. Mock-up is a model that designers use to illustrate their work. In this way customers can see a guideline, logo, web and mobile design, etc. on the computer screen. Due to this, you can get not a flat photo,but a realistic image.

Using mockups simplifies the interaction between designer and client. Everything that should be implemented is demonstrated on the platform. Design sets the general style of your application and helps users to understand what awaits them. Well-structured design creates a good impression on users. At first sight, people think that design contains only the arrangement of content and main blocks. However, everything depends on the type of application, amount of tasks and content. That's why it was considered to start a mock-up with main functionality to create a good UX design. After considering user flow, the logo has been created. Thereafter, the design of the website began.

3.5   Figma concepts

It's no secret that figma is one of the key and main tools for creating a website.
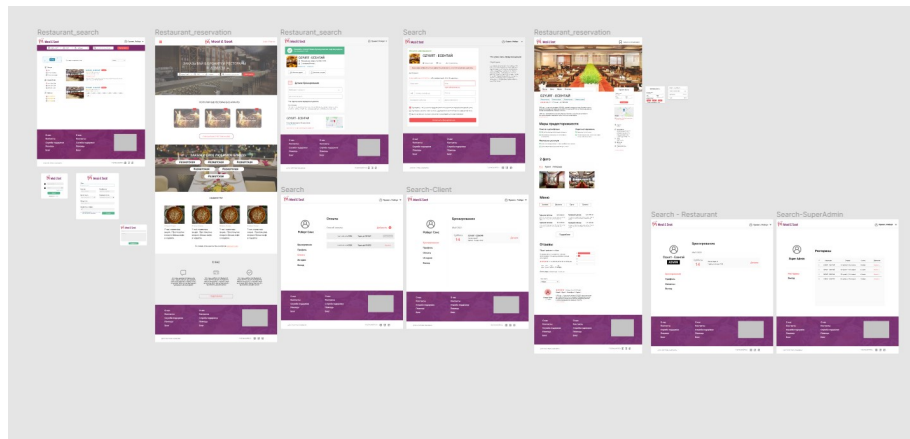
Figma is a cross-platform online service for front-end designers and web developers. The development of interfaces takes place in an online application.

Figma has two key features: access to the layout directly from the browser window and the ability to collaborate on documents.

3.5.1 Figma capabilities and features

Multi-user editing mode

Before Figma, it was difficult for multiple designers to work on the same project and hand over layouts to developers. Photoshop refused to open the layout correctly until you installed the correct fonts. Or a colleague made changes to his copy of the project and forgot to tell you about it. Below will be attached diagrams and layouts of the Meal and Seat site.
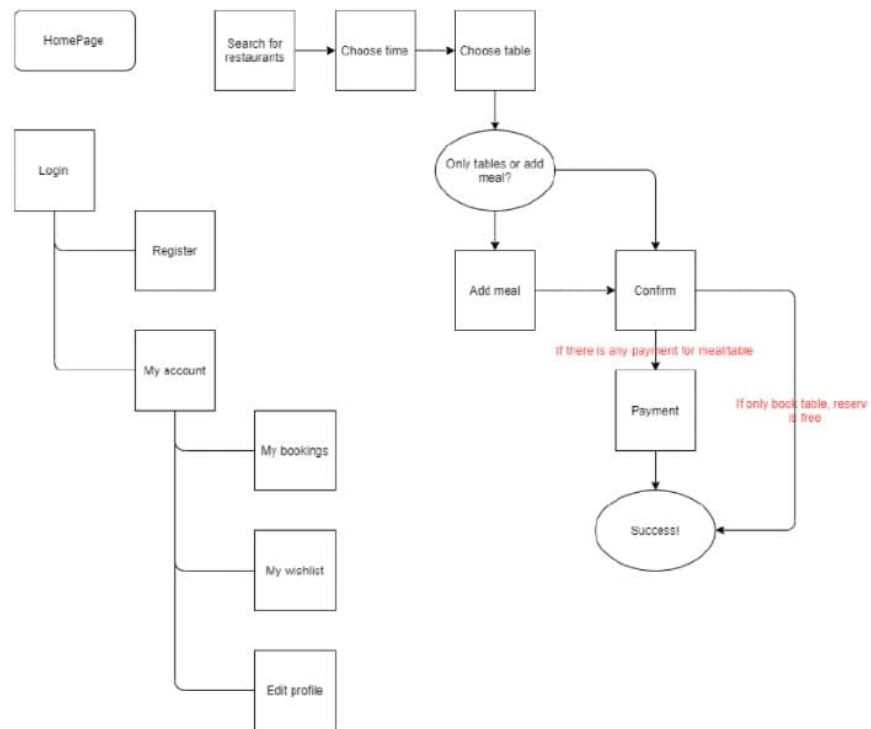

3.6 User flow

Besides the design and the creation of the project diagram, it is necessary to correctly design the interface and give the exact structure of the site. Below is the User Flow of this project.

User Flow - a custom scenario illustrates the order of actions that a user performs to solve a problem. A script is a skeleton of an interface, it consists of steps - separate screens. A user-friendly interface begins precisely with the elaboration of the user flow, the structure.

3.7 VueJS

As it is written above the main point in development of an application is understanding the stage of the project. Afterwards, developers should choose tools for creating software systems. In this diploma VueJS is used as a frontend tool.VueJS is a JavaScript framework that is used to create user interfaces. It is one of the most popular frameworks nowadays. One of the main reasons to use Vue is that the tools are provided to make development faster and easier. Vue contains HTML

String Substitution, Component Architecture, and Tools and other advantages for usage.

3.8   NuxtJS

During development programmers often make decisions that can affect the entire project. For web-developers it is important to choose the right platform for writing code for several reasons. One of the biggest problems in Javascript is rendering. When a client visits a page that was made using Javascript, his browser takes all the load on itself. Because of this, some scripts are not displayed on page. To solve this problem Server Side Rendering(SSR) is created. SSR helps to reduce the load on browsers. It is very important when a client uses old software or a weak computer. [] Also, SSR provides good SEO optimization and more flexibility.
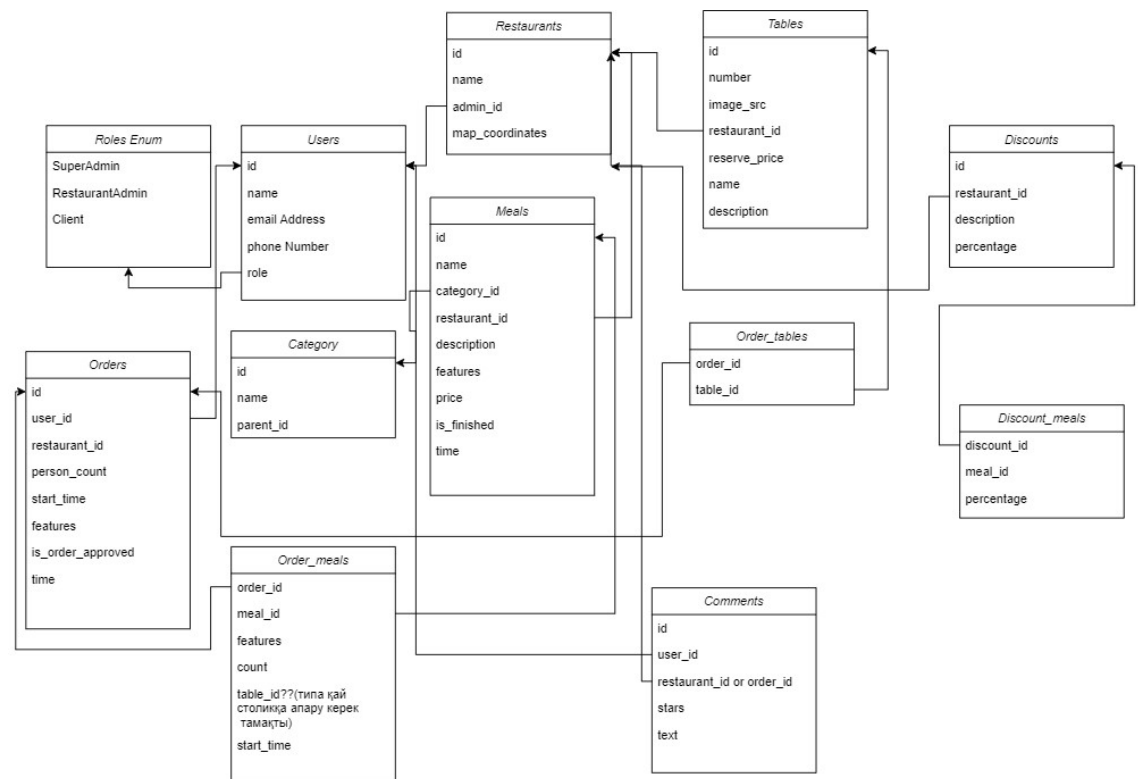
3.9   Database

For the Meal and Seat project, a database is needed to store and retrieve all the data related to the restaurant. It is necessary to correctly build the structure and connect all the tables. Below is the structure and tables of the Meal and Seat site. Links and connections are shown. You can also see that in addition to booking a table in a restaurant, it is also possible to order dishes without waiting in line.

3.9.1 PostgreSQL

Another important part in creating web services are databases. Database is used to store your data, save your data about requests, update , search by your request and keep them safe. Additionally, the database allows you to maintain order and prevent clutter. Another advantage of databases that it keeps data from losing it. For example, if a website crashes or shuts down, your data that was kept in the database will remain unchanged or the database will keep a copy of your files.

There are many databases that are used at the moment. For this diploma work, it has been decided to use PostgreSQL. PostgreSQL provides many different advantages and has good performance. It is one of the reliable databases and works on almost most UNIX platforms, Windows NT Server, Windows 2000 Server. Moreover, according to January 2021, DB-engines database ranking PostgreSQL occupied 4th place[]

PostgreSQL architecture is one of its strengths. Postgre can be used in client-server environments which brings benefits to both users and developers. By using postgreSQL architecture client programs cannot access data on their own, even if they are running on the same computer as the server process. In the next section will be written about how postgreSQL is connected with the Spring backend.

Chapter 4

Discussion

4.1 Results

Several tasks were carried out on this project. At the moment, a https://www.overleaf.c
of the Meal and Seat website has the opportunity to receive a service in booking
any institution in the city of Almaty. The advantage of this project is the ability
to book the desired table. That is, the client can, at his own request, choose a
table near the entrance or on the summer terrace. Further, in addition to book-
ing, there is a chance to order food and, having come to the restaurant, the client
will already have his order ready. It is very important to take this factor into
account as this service is very convenient for the site's clients. Bypassing the
whole queue and waiting time, the client will always adhere to the choice of this
site and recommend it to others.

4.2 Future work

With daily development of web services, websites need more features and simpli-
fication in usage. For this reason, restaurant reservation needs to be upgraded.
The main aim for future realization is that this web service will adapt for each
restaurant. Furthermore, it has been discussed to remove some functionality from
RestaurantAdmin users to make their work easier. Specifically, we want to add a
service that automatically connects to the restaurant systems, like Aiko etc. This
will reduce work not only for Restaurant Administrators, but also be useful for
customers. Due to that fact, if the restaurant admin forgets to update the data
in the webpage, there will be problems for managing places. After getting auto-
matically connected to the restaurant system , it has been considered to create
3D models of restaurant schemes. So clients are able to see visual plans of placing
seats. In the first steps, it will be just a 2D plan which will be the same as in
restaurant systems. Therefore, it helps customers quickly book tables in the cafe.

Next, it was decided to add an ML recommendation system for users. The

training data will be used from the comment section that users leave in the website. By considering their comments and rating, software will help them to choose the best restaurant to spend time. In first steps, only rating will be chosen to recommend then by using NLP it will be recommended by comment texts.

It is recommended to add more features for PaymentController class. Let's consider the case, when the user made an order and paid money for it, however, the order did not finish. In this case, the administrator of the restaurant must have the access to order and payment to receive or reject the payment. This would the most optimal solution for client and admin side.

Chapter 5

Conclusion

Taking into account all of the above, we can present this platform as competitive. Since all the goals of this thesis have been fulfilled. A lot of work has been done to create a platform that takes into account all the data and requirements from the audience, including the restaurateurs themselves. With their many years of experience, you can be guaranteed to rely on the Meal and Seat website. In addition to all this, this platform is intended for further development. But to improve the site, it will be necessary to study and collect more data, conduct analyzes as well and attract more restaurants and establishments. In the future, it is planned to discuss several options and set tasks regarding the possibility of connecting a mobile application with further improvement, thereby providing a wide range of services to guests.

Appendix A

AppendixATitle

A.1 Theorem

A.2 Proof

etc. etc.

Appendix B

AppendixBTitle

bibliography.bib