International Information Technology University JSC

Faculty of Information Technology

Department of Information Systems

Final Project

"Software Requirements Specification Development"
for discipline "Fundamentals of Information Systems"

"Personal Task Management Software"

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Group: IT1-2017

Almaty, 2022

1 Introduction

This document outlines the project plan for the development of a "Personal Task Manager" - an information system for recording a personal to-do list for each day of the month in the calendar.

The main idea of creating this system is to improve the management of your own affairs in order to not forget about them and free up time for your personal life and other important matters. Task management for the unprepared can be quite a difficult process because either they devote little time to this, which is why important points may remain ill-conceived, or they devote too much time, and in an overabundance of information, coupled with constant planning, they burn out and lose the desire.

We want to fix this moment. Create a system so that its use is not stressful, and so that it has only the necessary details for planning cases. To do this, it was decided to stick to minimalism, efficiency and add gamification. If everything is already clear with the first two points, then the reason for adding gamification is to increase the motivation of users to use the product and at the same time to consciously plan important things.

In order to use the functionality of the product, you will need to register. After registration, a calendar view of scheduled tasks, a general to-do list, a store and settings will be available. If you briefly go through the sections, then the calendar view in order to better navigate the layout and deadlines, a general to-do list for creating, changing, deleting and sorting tasks, a store for buying in-system products such as customization of the site and avatar, and settings in order to see your profile and, if anything, make changes there.

2 GENERAL INFORMATION

2.1 Full name of IS and its abbreviation

Personal Task Management Software. “Personal” because for individual use, “Time Management” because we have a to-do list for productivity, “Software” because it is a web application.

Product name: “Do it now”. Because our mission is to change a person, and in order to change, we need not delay, but act right now.

2.2 Information about developers and customers

The developers are Temirlan Zhumagulov and Danial Daniyaruly.
Our phone numbers: +77083705095 (Zh. Temirlan); +77774706560 (Danial Daniyaruly).
Residential addresses: Almaty city, Nazarbayev Street, house 14; Almaty city, Nursultan Street, house 21.
Email addresses: temirlanzhumagulov@gmail.com, danialdaniyaruly@gmail.com.

The customer is Askar Kairatuly.
Works for the company "Beyond Reality".
Phone number: +7 777 555 22 11.
Residential address: Almaty city, Tokaev Street, house 5.
Email address: askar_kairatuly@gmail.com.

2.3 Project timelines

Start: 24.03.2022
End: 10.05.2022

2.4 Funding

The sponsor of the development of this system will be our customer. He is the director of his company and decided to make an order on her behalf. According to our calculations, the system will cost 1,5 million tenge, it is for project cost without additional costs. 2 employees will work on its development for fulltime. General labour rate for developers will be about 3300 tenge per hour. The duration of work is from 7 weeks to 11 weeks. The estimate of the amount is based on the complexity of the implementation of the information system with all its functionality and on the timing of the development of the system. Additional costs will depend on the choice of server load.

3 PURPOSE OF CREATING INFORMATION SYSTEM

3.1 Relevance

Due to the increase in information consumed and the number of things that need to be done, an increasing percentage of people are beginning to feel overworked. The traditional method of using a notepad with a pen is beginning to lose its former effectiveness, because many of the same processes have to be repeated and their design may take longer than necessary. The development of PTMS will help with the automation of many processes, and the gamification of the system will increase the involvement, motivation and efficiency of the user.

3.2 Use

This application can be used in your personal life to plan tasks related to work, study, meetings, training and many other things. But this is about the product itself. And if we talk about a system with a database and a server, then it can be used in your work to plan tasks for it, in your studies, both for a student and for a teacher and in other areas of activity where planning is necessary. However, it should be remembered that this system is for individual use and there is no functionality for collaboration.

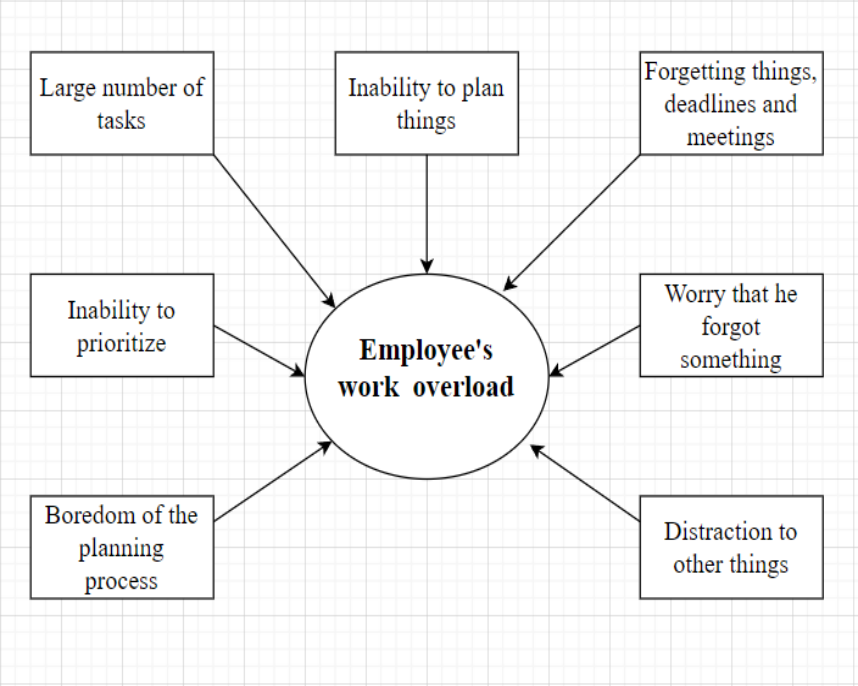
3.3 Ideology

IS development ideology - Automation of the planning process to simplify it and increase user interest through gamification.

3.4 Formulation of the problem

Problem: overload from work.

Example:



Picture 1. Employee`s work overload

3.5 Formalization of the problem

To solve this problem, it is required to create a system with simple task management, and make the process interesting through its gamification and automation.

3.6 The goal

Development of PTMS in order to solve the problem of overload from work through simplifying the processes of planning and gamification of the system. A distinctive feature of the software application is an increase in engagement, motivation, and, as a result, productivity with the help of gamification elements.

3.7 Objectives

1. Analysis: Identifying problem, finding a solution, writing technical and non-technical requirements from client, identifying risks and benefits.
2. Design: Making a choice of style, defining main colors, defining location of interface elements, creating a prototype in Figma.
3. Development: Site layout, adding animations, filling with content, development of the main application functions, creating database, connecting website to the database.
4. Testing & Debugging: Functionality testing, checking the usability of the site, performance test, security check, interface testing, UI testing, Debugging.
5. Deployment: deploying the site on the application server.
6. Maintenance and Promotion: Updating the application version, copying data, making changes to the code, promoting the site using Google advertising on YouTube, and on social networks using SMM.

3.8 Advantages

Simplicity. Most similar applications are a bit difficult to use due to the large number of functions and details, which is why we decided to make the program minimalistic on the contrary.

Gamification. The planning process itself is boring for many people and after several times using the application they become too lazy to use the application. Therefore, adding elements of the game will increase interest.

3.9 Disadvantages

Slow operation of the site at a large number of requests.
Possible glitches when synchronizing the calendar with created tasks.
Perhaps the database will weigh a lot due to the constantly increasing data.
The risk of data leak.

4 SOFTWARE REQUIREMENTS

4.1 Requirements for the structure and functioning of the IS

4.1. 1 Software technology used

Backend technology: Java, PostgreSQL, Spring Boot;
Frontend technology: HTML, CSS, JavaScript, Bootstrap;
DevOps: Maven, Postman;

4.1.2 IS model

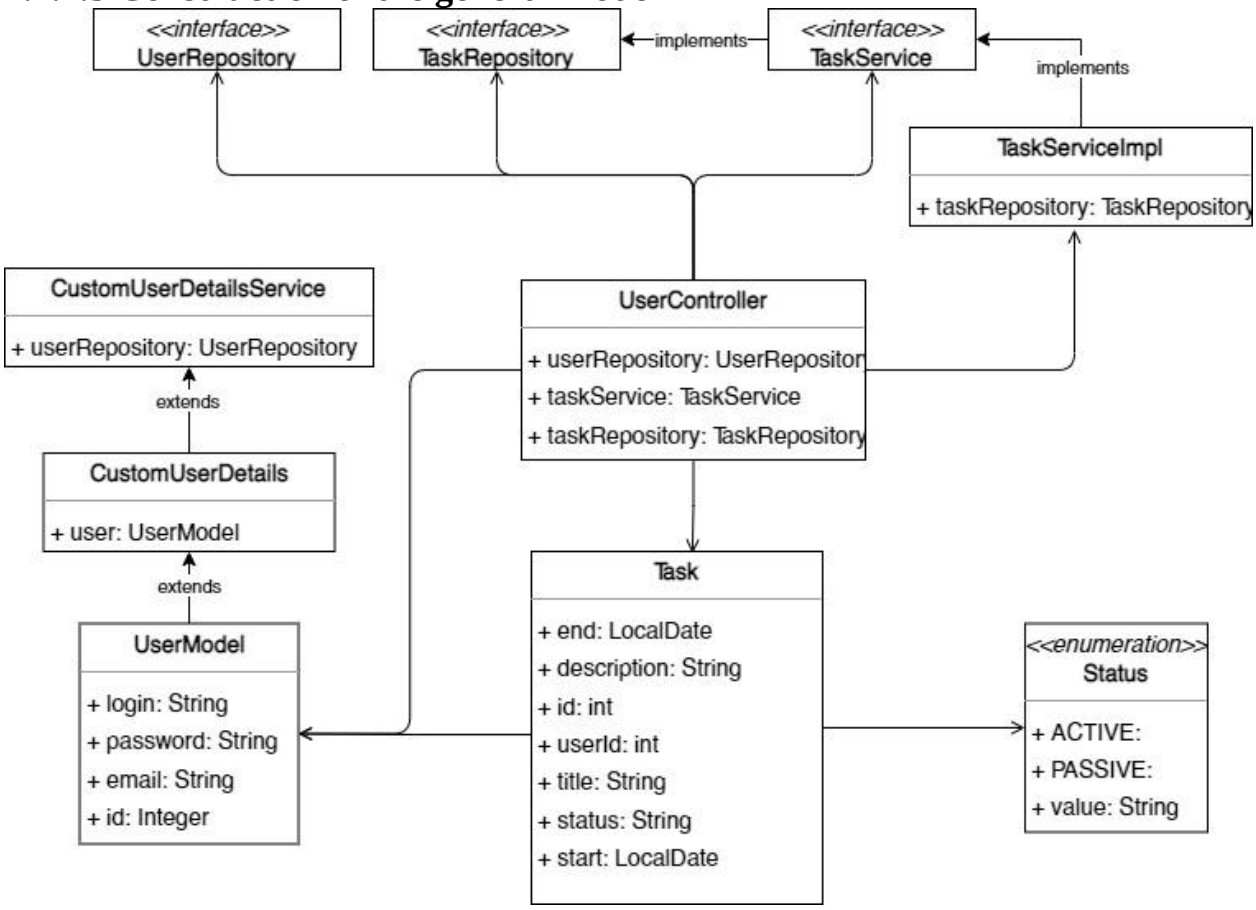
4.1.2.1 Selection of the model

Unified Modeling Language

4.1.2.2 Justification of the model chosen

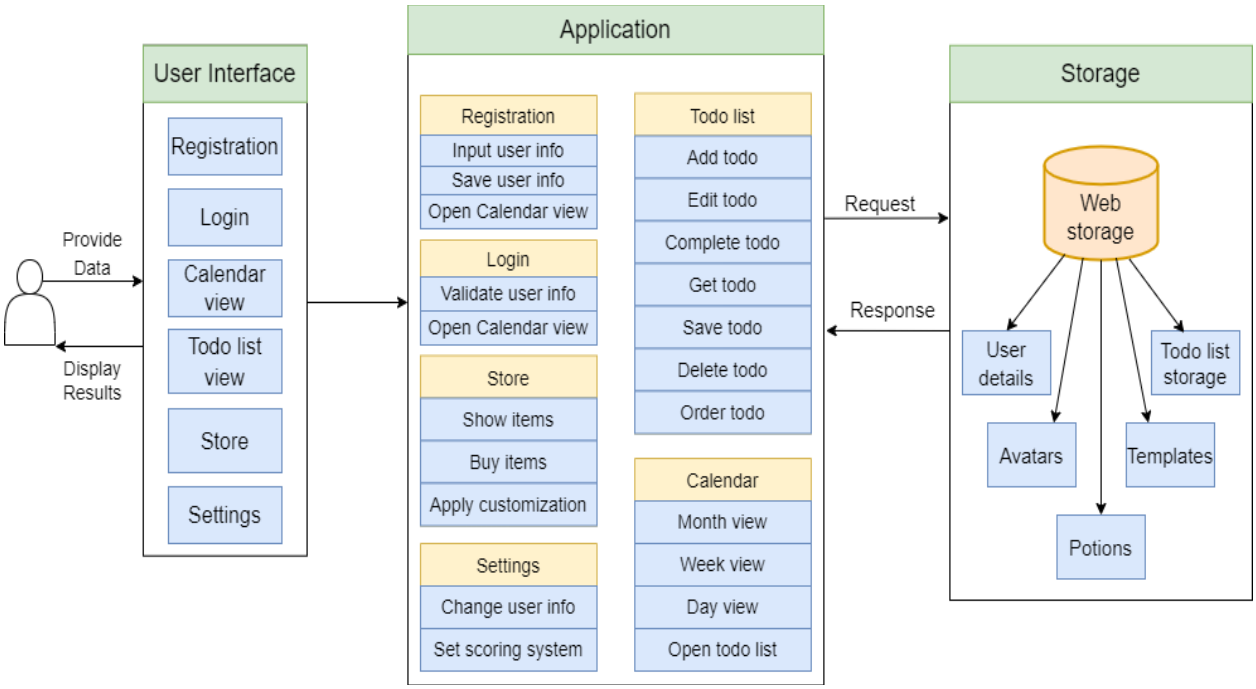
We have chosen a UML to describe entities and relations between them in our information system and because our system is object-oriented software.

4.1.2.3 Construction of the general model



Picture 2. Model of PTMS

4.1.3 IS Architecture



Picture 3. Architecture of PTMS

4.1.4 information support requirements

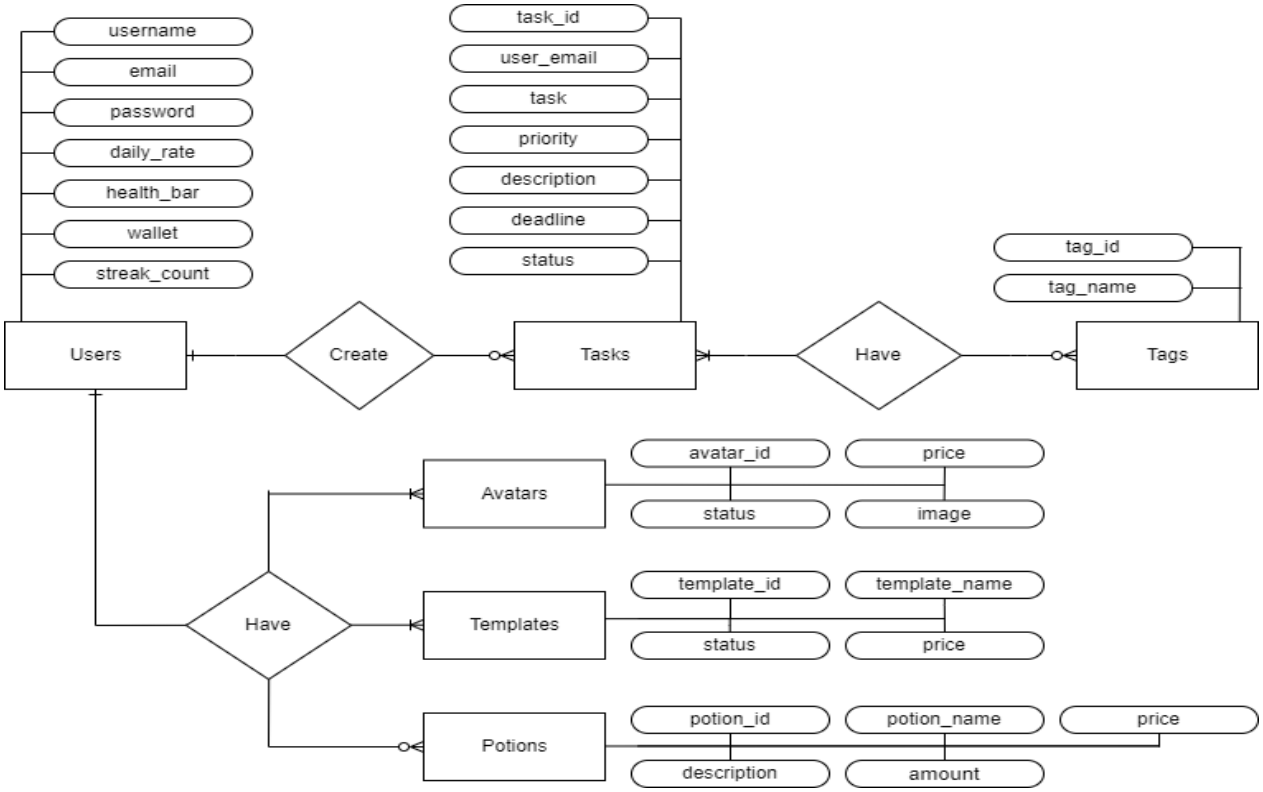
Approximate max: 1 MB. Number of images – 25.

4.1.5 Software requirements

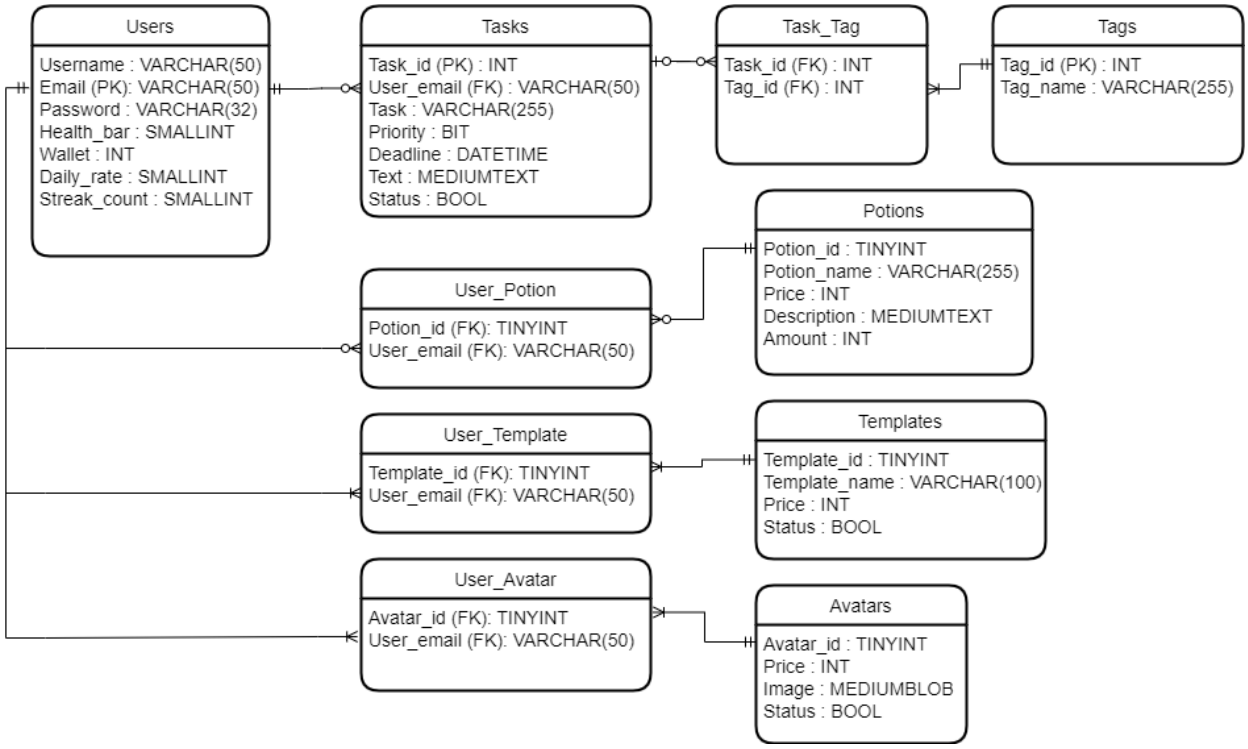
Approximate max: 2 MB. Number of files – 138.

4.1.6 Requirements to the construction of the algorithm

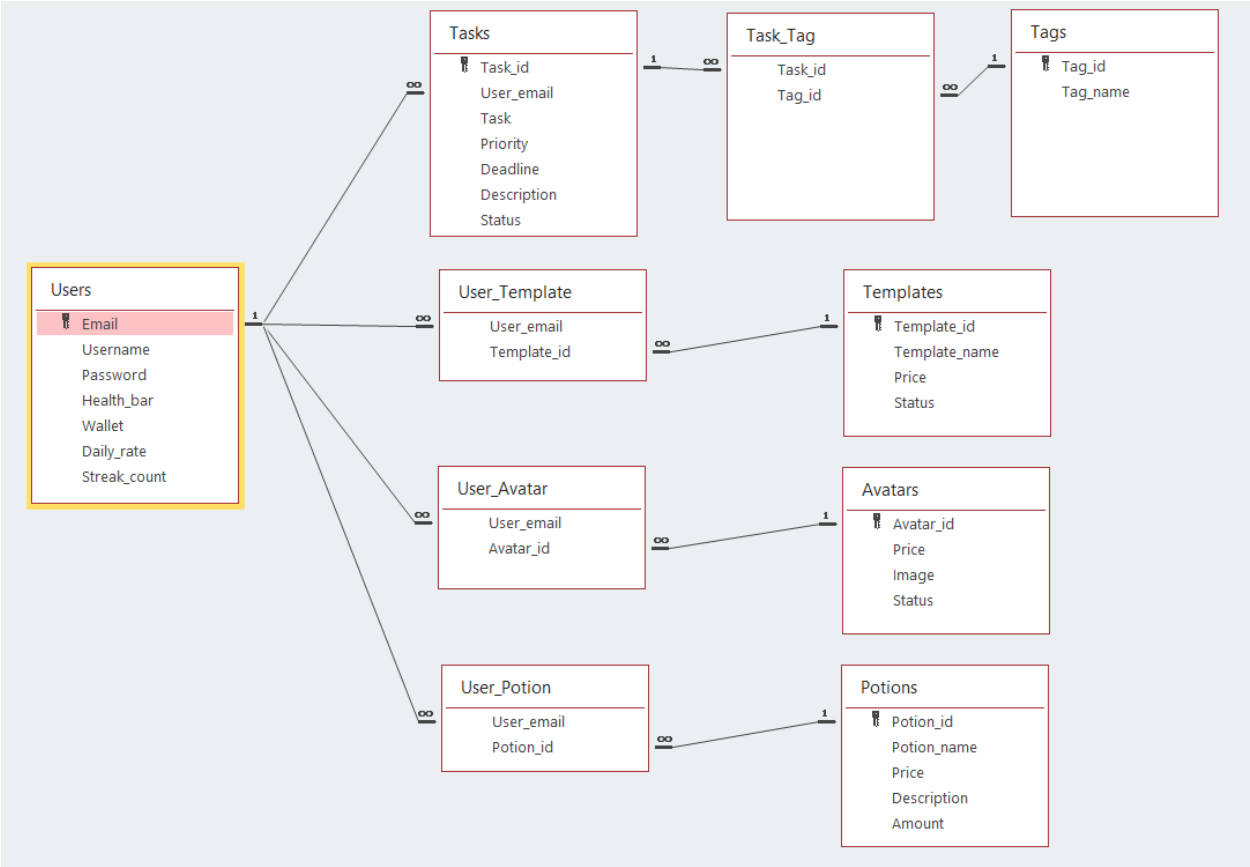
4.1.6.1 Structure of databases



Picture 4. ERD



Picture 5. Schema plan



Picture 6. Structure of database

4.1.6.2 Data Access Technology

Java Persistence API (JPA) is a Java EE API specification that provides the ability to store Java objects in a database in a convenient form. There are several implementations of this interface, one of the most popular uses Hibernate for this.

Hibernate — (ORM) Object Relational Mapping framework or library that is compatible with JPA. This is a programming technology that connects databases with the concepts of object-oriented programming languages, which is needed to make life easier for programmers, there is no need to write queries yourself, no need to create tables, connect to the database somehow and add the ability to use multiple users of this database.

After applying hibernate, it becomes very easy to extract, edit and add data to the database.

Spring has Spring Data for this reason, sunset manually with the tedious writing of your DAOs is no longer required.

Hibernate is an implementation of JPA, and Spring Data JPA is an abstraction of JPA data access. Spring Data offers a solution for custom GenericDAO implementations. It can also generate JPA requests on your behalf using method naming conventions.

In Spring Data, you can use Hibernate, EclipseLink, or any other JPA provider.

4.1.6.3 Requirements to the user data queries from the database

Show user details (username, email, password).

Show user progress (points, completed tasks, uncompleted tasks).

Change user details (username, email, password).

Change requirements for tasks and points.

Show to-dos (name, description, date, priority).

Create and Save to-do.
Delete to-do.
Edit to-do.
Make to-do completed or uncompleted.
Order to-dos by priority or date.
Show to-dos on calendar.

4.1.6.4 Requirements to the source code/programming languages

The source codes of the program must be implemented in Java. The IntelliJ IDEA environment should be used as an integrated development environment for the program.
The design of the web application should be implemented in HTML, CSS and JavaScript in the Sublime text editor.

4.1.6. 5 Modern theories and methods of IS development

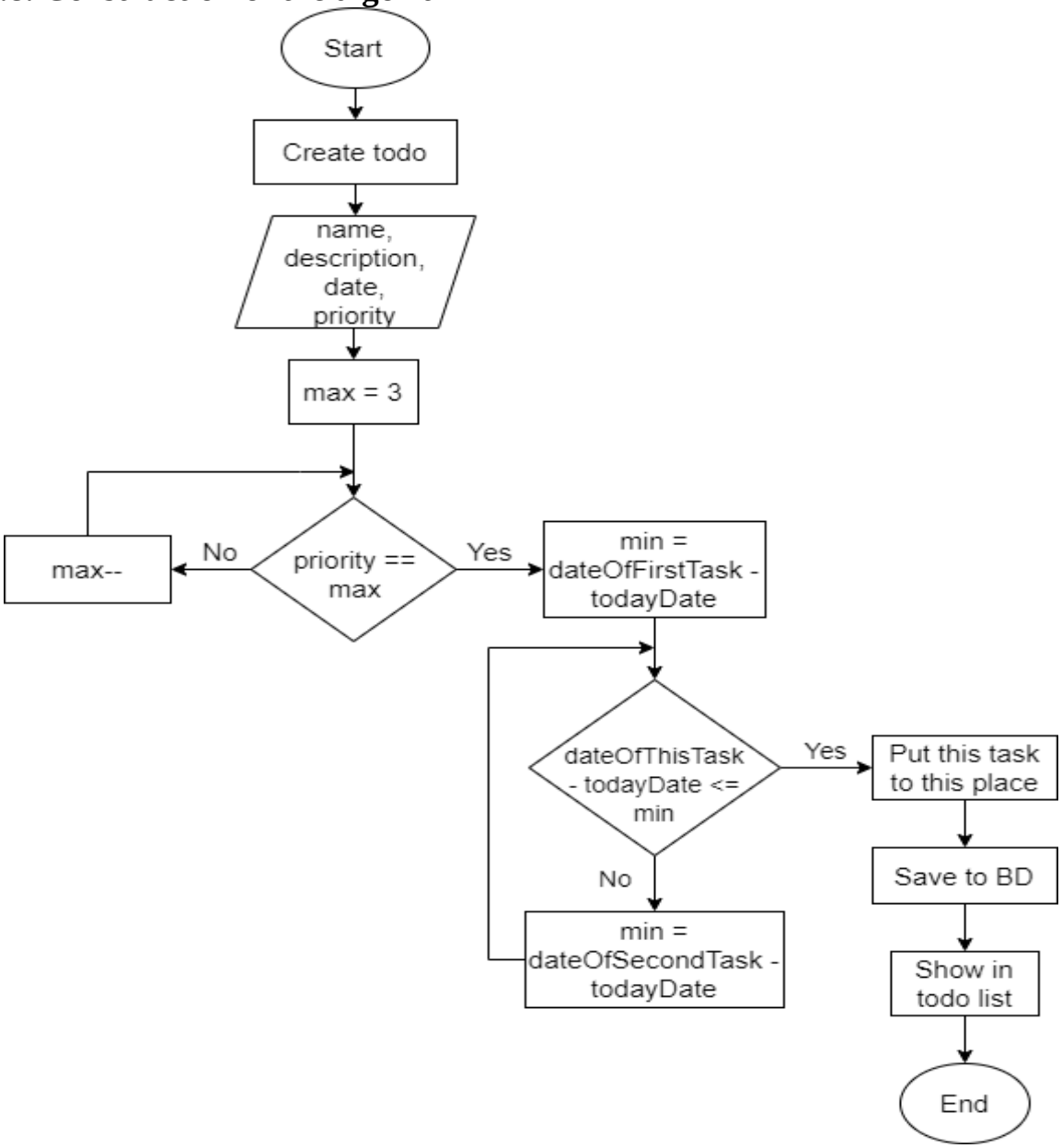
Modeling of systems and UML:

UML, short for Unified Modeling Language, is a standardized modeling language consisting of an integrated set of diagrams, developed to help system and software developers for specifying, visualizing, constructing, and documenting the artifacts of software systems, as well as for business modeling and other non-software systems. The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems. The UML is a very important part of developing object-oriented software and the software development process. The UML uses mostly graphical notations to express the design of software projects. Using the UML helps project teams communicate, explore potential designs, and validate the architectural design of the software.

4.1.7 OS requirements

The web site supports cross-browser compatibility, so the site can run on any operating system which has support for browsers such as Google Chrome, Yandex Browser, Safari, Opera, Firefox and etc.

4.1.8. Construction of the algorithm



Picture 7. Flowchart of creating task

4.2. Reliability requirements:

4.2.1 Requirements to ensure reliable operation of the IS

A user working with the program through a web browser must be granted continuous access to a web application located at a specific URL address. The web service should not interrupt its work unexpectedly. Also, on the website to-do list must be synchronized with the calendar. The date must be determined correctly. It is necessary to hide access to sensitive information and scan the web application to identify any points that could potentially be used against us by attackers.

4.2.2 Recovery time after a failure.

In case of failure of the server part and subsequent unavailability of the web application, the recovery time should not exceed one business day.

4.2.3. Failures due to incorrect actions of the system users

DDoS attacks on the application server. A large number of malicious requests can completely fill all the channels of the server.

Hacks from the user side can change data, make secret information available.
The user can create a very large number of tasks, which will eventually lead to incorrect operation of the website due to data overflow.

4.3. IS Security

4.3.1. Copyright protection

GNU GENERAL PUBLIC LICENSE Version 3, 29 June 2007

4.3.2. Protection of information

4.3.2.1. Methods of protection

Protection from DDoS attacks, SSL-certificate, Security protection from Spring framework and antivirus protection of server.

4.3.2.2. Protection algorithm

Spring Security is a Java/JavaEE framework that provides mechanisms for building authentication and authorization systems, as well as other security features for enterprise applications.

Main features:
1. Spring Security offers to assign a custom password encryptor to the UserDetails object. By default, BCrypt is used. You can also configure the number of hashing rounds and the implementation of a random algorithm.
2. Lightweight Directory Access Protocol (LDAP) is a protocol for authenticating user accounts in organizations. Allows you to define the structure of users and user groups, assign them access rights.
3. Open Authorization 2.0 is an open standard for verifying user rights using the authorization service. It is also used to implement functions such as logging in through Facebook, Google, and other major sites.
4. This is a built-in recognition mechanism, thanks to which users do not need to enter credentials every time they visit the site.

4.3.2.3. Anti-virus Protection

BitDefender GravityZone Business Security - a bundle of security services designed for small and medium-sized businesses and combining #1 protection with simple centralized management of the protection of workstations and servers.

4.3.2.4. Protection against attacks

DDoS Guard Protection against DDoS (L3-L4) 10 Mbit/s from selectel.ru.

4.3.2.5. Protection against hacking

SSL-certificate (Secure Sockets Layer).

4.4 Requirements for exploitation

4.4.1 Exploitation conditions

4.4.1.1 Climatic conditions of exploitation

The program will work perfectly from plus 5 to plus 25 °C at a relative humidity of 80% and an atmospheric pressure of 462 mmHg, since such conditions approximately correspond to the operating conditions of modern non-industrial computers.

4.4.1.2 Requirements to employee's qualification and number

The minimum number of personnel required for the operation of the program should be at least one full-time unit — the end user of the program performing the functions of the site administrator and operator. The list of tasks performed by the site administrator should include:

1. Development, support of the website concept, improvement of its work. Improvement and correction of the current structure of the web resource.
2. Organization of the technical side of the resource and security control.
3. Development and implementation of a strategy for promoting a web resource on the Internet.
4. Analytics of attendance, visitor engagement, conversion; development of plans for further publications in accordance with the needs of the target audience is also included in the functions of the site administrator.
5. Feedback from the visitors of the resource: work with comments, responses to messages.
6. Organization and control of full-fledged work, correct functionality of the site, constant monitoring of the availability of the web portal for users on the network.

List of minimum requirements to the qualification and number of employees.

Required knowledge and skills

1. Confident computer skills, especially on the Internet. Understanding of the principles of operation of Internet pages, an idea of the processes leading to malfunctions or breakdowns of an Internet resource and knowledge of methods of their correction.
2. Knowledge of programming languages (HTML, CSS, JavaScript, Java). In the absence of such skills, if there are failures in the operation of the portal, you will have to resort to the help of programmers.
3. The skills of drawing up technical tasks for web designers, developers, cooperation with whom is an integral part of the work both during the preparation of the resource for launch, and when making further changes (redesign, introduction of new functionality).
4. Knowledge of CMS systems for the organization of website management.
5. Knowledge of search engine optimization methods on the Internet is necessary to manage the process or participate in the development of a strategy for SEO promotion of a resource.
6. Skills in providing comprehensive security of Internet resources.

4.5 Technical requirements:

4.5.1 The recommended monitor resolution range at which software will be viewed is

nHD — 640×360 (16:9) — 230,4 kpix
VGA — 640×480 (4:3) — 307,2 kpix
SVGA — 800×600 (4:3) — 480 kpix
XGA — 1024×768 (4:3) — 786,432 kpix
HD 720p — 1280×720 (16:9) — 921,6 kpix
Full HD 1080p — 1920×1080 (16:9) — 2,07 Mpix

4.5.2 The minimal monitor resolution range at which software will be viewed

For smartphones - nHD — 640×360 (16:9) — 230,4 kpix
For laptops - XGA — 1024×768 (4:3) — 786,432 kpix

4.5.3 Recommended PC configuration

Processor: 4 x 1,6 GHz CPU;
Memory: 4-GB RAM or more;
Hard Drive: 64 GB or more;
Ethernet connection (LAN) OR a wireless adapter (Wi-Fi);

Hardware requirements depend on the number of site visitors and the amount of information. A faster processor reduces the time for generating HTML pages from XML/XSL objects - this is the most resource-intensive process. Several processors will ensure the operation of the site with a large influx of visitors. A large amount of RAM will allow you to remember the results of frequent database queries. A high-speed SCSI or SAS hard drive will reduce delays in all operations.

4.5.4 Minimal PC configuration

Processor: 2 x 1,6 GHz CPU;
Memory: 2-GB RAM;
Hard Drive: 32 GB;
Ethernet connection (LAN) OR a wireless adapter (Wi-Fi);

Running model-driven apps on a computer that has less than the recommended requirements may result in inadequate performance. Additionally, satisfactory performance may be experienced running systems that use a different hardware configuration than those published here—for example, a system with a modern quad-core processor, lower clock speed, and more RAM.

4.6. Non-Technical requirements to IS:

4.6.1 Adaptability

Firstly, the client can use the mobile and desktop versions of the page, since the design will be created using modern technologies that contribute to adaptability to different sizes of monitors and smartphones.
Secondly, the simplicity of the site will be intuitive for both the customer and the users**.**

4.6.2 Intellectual development

Do it now PTMS collects data about the user to motivate him in the future if he performs low-priority tasks in a small amount.
Also, when actively performing high-priority tasks in a sufficient number, PTMS rewards the user for the work shown at the end of the day. Additionally, PTMS, based on user statistics for the last week, month or year, if the user completed all the tasks without breaking deadlines, will reward the user by showing his statistics for a given period of time.

4.6.3 Consistency

Our IS called PTMS is a system because the database, frontend, and backend of our site form a whole structure of separately working elements that are connected to each other, which in turn determines its consistency.

4.6.4 Full functionality

The website administrator can change the source code of the website that will be stored on its media through the application server. This is because website is consisting from files which we should host on site.

4.6.5 Integrity

Our system consists of modules such as to-do list, calendar API, Registration, Notification system, Reward system, Motivation system, which are closely interrelated, based on this we believe that our system is integral.

4.6.6 Quality

4.6.6.1 Functionality

1) Authentication of user whenever he/she logs into the system;
2) Adding, changing and deleting tasks in the to-do list when clicking on certain buttons;

3) Opening the to-do list of any day by clicking on a day in the calendar;
4) Adding priorities, deadline, and name for a task when creating it;
5) Providing buttons for adding priority, deadline and name for a task when it is added to the to-do list;
6) Dragging a task to the completed list when clicking on the checkbox;
7) Dragging a task from the completed list back to its place when clicking on the checkbox;
8) Dragging a task from the inbox list to a selected day on the calendar;
9) Enabling task replay when creating a task;
10) Enable task repetition (every day or select the desired days on the calendar of the week) if the user creates a task in the recurring to-do list;
11) Choosing a convenient calendar format weekly or monthly when pressing a certain button;
12) Showing motivation notifications and removing hp, from the life strip, when deadlines are broken;
13) Showing a reward notification if there were no deadline breakdowns during the day;
14) Showing statistics for the week, month and year if the given time comes from the moment of use;
15) Registration and validation the data sent to the server when submitting the registration form.

4.6.6.2 Reliability

With 100 requests per second, the site's performance will drop by 200%, the site's response will be 10 seconds.
When trying to transfer tasks from Google Calendar to PTSM, there may be synchronization errors that may affect the speed of the application.
When 1,2 GB of information in the database is reached, the application performance will drop by 2.5 times.
If the application is hacked by hackers, the application will stop working, recovery will take 1 day.

4.6.6.3 Ease of application

Our system is simple to use, since we took its simplicity and ease of mastering as the basis of the site. The design will be user-friendly. The site includes only the most necessary and they will be located in an accessible location for the user.

4.6.6.4 Effectivity

For the effective operation of the site, the number of active users per minute should not be more than 100. To use the database effectively, the amount of information should not exceed 1.2 GB.

4.6.6.5 Maintainability

Since we have a website, the changes can be implemented immediately. Possible big changes will be announced on the site in advance. In order to avoid problems with adding new functions to the site, a block separation of subsystems will be implemented, where in case of a breakdown of one subsystem, others will retain functionality.

4.6.6.6 Possibility to learn

There will be a visual instruction on the site so that the user learns to use it quicker than usual.

4.6.6.7 Modifiability

Available.
As site modifications, we offer:
1. Analytics of attendance, visitor engagement, conversion, for website promotion on the Internet.
2. Improvement and correction of the current structure of the web resource, for convenient use.

3. Feedback from visitors to the resource: work with comments, responses to messages. For further product development.

4.6.6.8 Mobility

Since the PTMS information system is a website that is cross-browser and cross-platform, and can be supported on different operating systems, it will be able to continue to function when moving from one environment to another.

4.6.6.9 Finiteness

The limit for the database is 1.28 GB due to non-optimized algorithms for data processing.
The limit for the server is 1000 active users because more people require the use of multithreading and asynchrony in the source code.

4.6.10 Accuracy

Difficulties with accuracy may arise when working with the calendar. Possible threats: incorrect synchronization with Google Calendar, with date and time, notification system while working with it.

4.6.6.11 Autonomy

The components of our application interact with each other, and this is exactly what allows them to perform the main functions of our application. However, the modules of our system can work independently, but not as originally planned, you may lose access to some of the functions that these modules had.
In addition, the entire system may be in danger if it works offline, an administrator is required who will monitor possible errors that may occur in case of hacks, or system errors when supplementing the source code.

4.6.6.12 Stability

In case of failures or violations, in order to maintain an effective level of performance, initial diagnostics and finding problems that may arise if the application is not used correctly by the user and elimination of them are required.
If errors were unavoidable, depending on the threat, the site may stop working for an hour or a day until the administration corrects this error.

4.6.6.13 Security

To prevent hacking and maintain the confidentiality of personal data, it is necessary to hide access to confidential information and scan the web application to identify any points that could potentially be used against us by intruders. There will also be recommendations on the use of strong and complex passwords.
As for the regular backup of the website and all data, we consider it necessary to encrypt the storage of critical data and backups, as well as storing backup files not on the file system, but in another place, the security of which there is no doubt and which will always be at hand for rapid deployment.

4.6.6.14 Informational content

The input data will be checked by patterns, for the validity of registrations and other data during the operation of the program.

4.6.6.15 Sociability

In case of an error during validation, the program will output friendly and understandable expressions so that the user can understand his error.

4.6.6.16 Time efficiency
As long as the load of the site has not gone beyond defined limits, it will work effectively. When one task is fully completed, its transfer to the database requires 0.1 ms and 2KB of information.

4.6.6.17 The effectiveness of memory
The site does not require a large amount of memory, and can run on almost any computer whose characteristics are greater than or equal to the minimum requirements for launching the browser and information system.
Processor: 2 x 1,6 GHz CPU;
Memory: 2-GB RAM;
Hard Drive: Minimum 32 GB;
Ethernet connection (LAN) OR a wireless adapter (Wi-Fi);

4.6.6.18 Efficiency devices
Most Internet users are impatient: 40% leave a website that takes more than 3 seconds to load. If the page does not load fast enough, they will close the site before they are dragged down by PTMS. Our website also contains dynamic content extracted from the database. To ensure the smooth operation of the website, it is necessary to monitor the performance of the database too. To solve all these problems and to make the site effective, you need to use reliable and efficient CDNs such as G-Core Labs
1. Response time less than 30 ms;
2. The total network capacity is more than 50 Tbit/sec.

4.6.6.19 Intelligibility
A feature of PTMS is simplicity and minimalism, thanks to which the user quickly understands the functions of our website and will be able to apply them in his personal life.

4.6.6.20 Structured
Our system fully complies with the principles of structural programming, namely the presence of sequences, repetitions and selection. All this is realized through the creation of to-do and work with them.

4.6.6.21 Readability
We choose google fonts as fonts — Google fonts will be displayed the same on all devices and always look good: Ubunta, Roboto or Open Sans.
The next important point is the line spacing and letter spacing in the site there will be enough free space to make it easy to read.
Thirdly, highlighting the main thoughts, structuring the text with the help of headings and subheadings, splitting into paragraphs.

4.6.6.22 Extensibility
The limit for the database is 1.28 GB due to non-optimized algorithms for data processing. Extensibility of system itself is dependable on server which we are using. Nevertheless, there would be a lot of opportunities for extensibility because PTMS consists modules which could work independently.

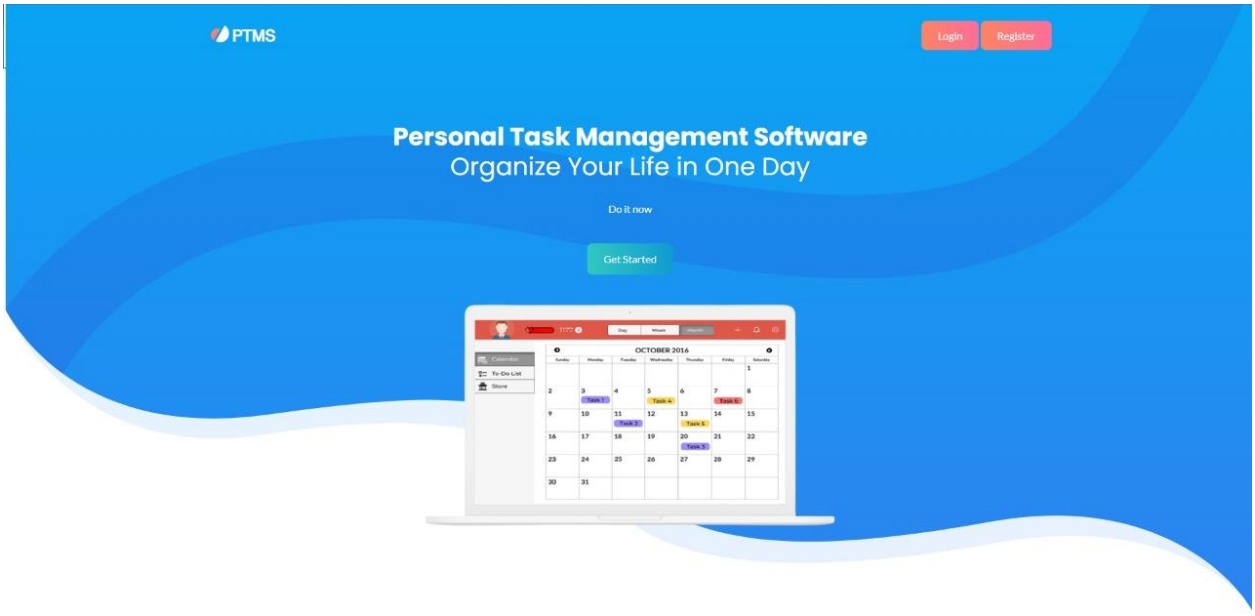
4.6.6.23 Modularity
Our system consists of modules such as to-do list, calendar API, Registration, Notification system, Reward system, Motivation system, which are closely interrelated, but could work independently. However, this may cause some problems with database. That is why our system is somewhat modular.

4.6.6.24 Regardless of the device

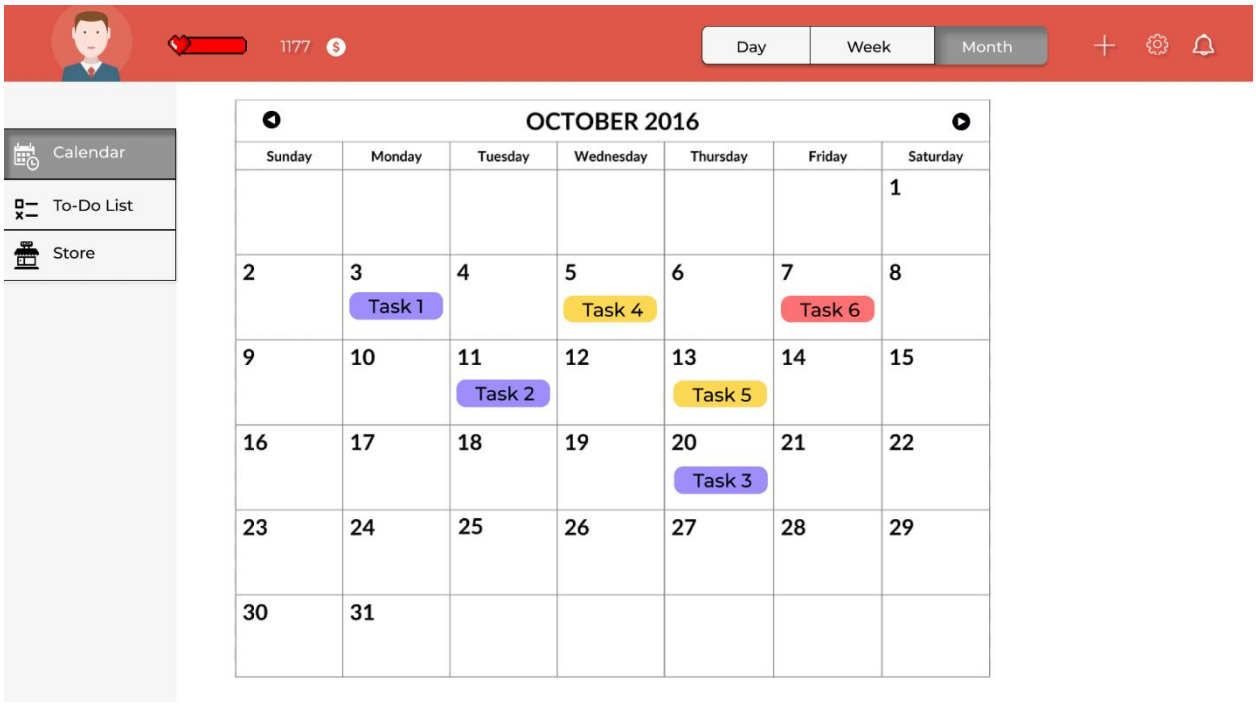
Since the PTMS information system is a website that is cross-browser and cross-platform, and can be supported on different operating systems, it will be able to continue to work regardless of the device.

5 PSYCHOLOGICAL FEATURES

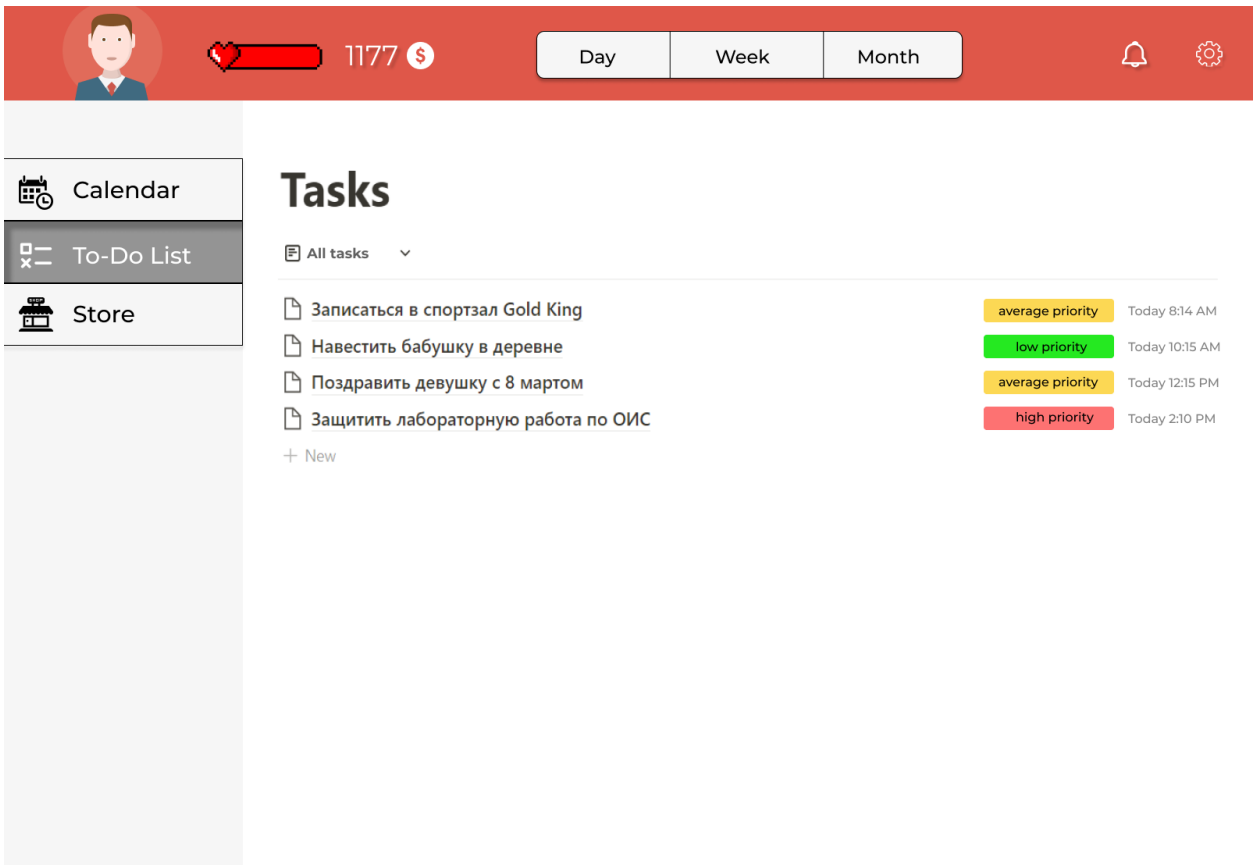
5.1.1 Aesthetic look



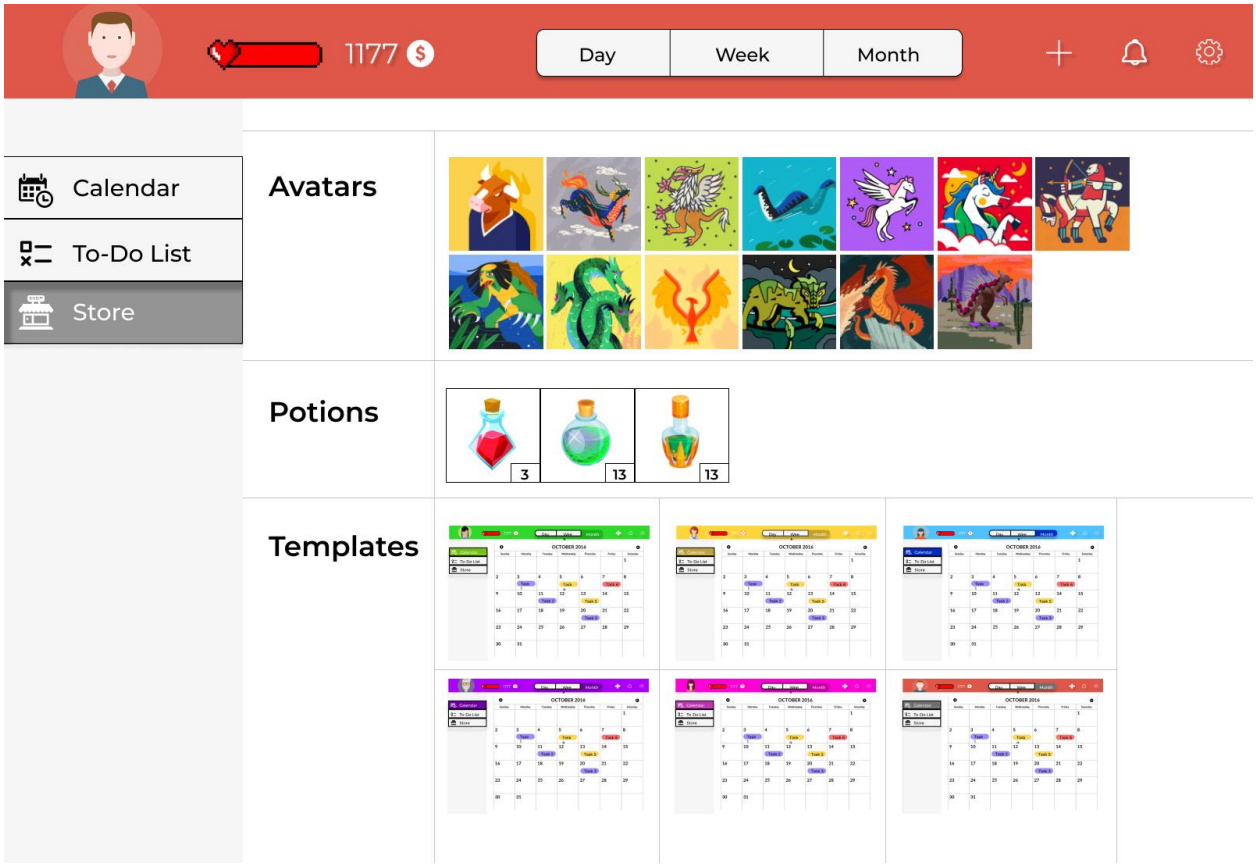
Picture 8. Main page



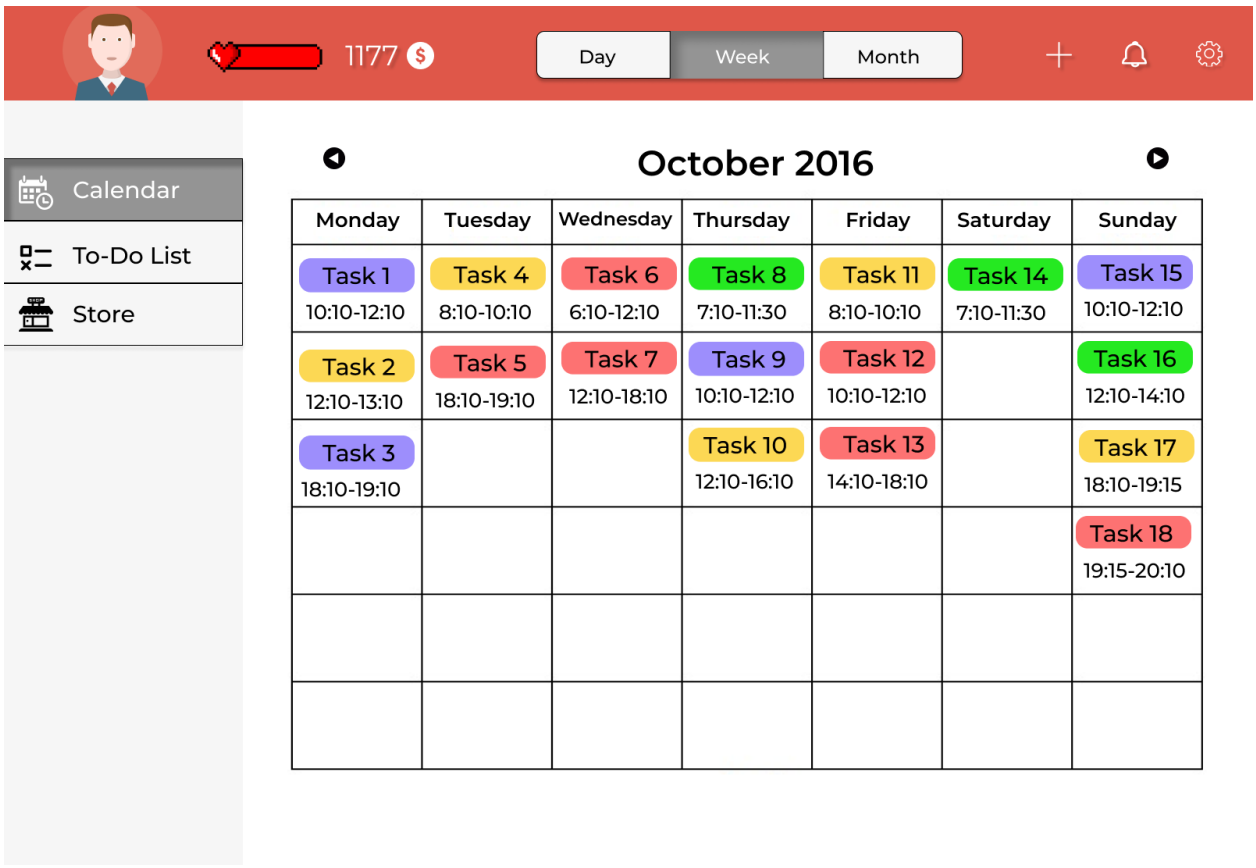
Picture 9. Month calendar view (main menu)



Picture 10. To-Do List view



Picture 11. Store view



Picture 12. Week calendar view

5.1.2 Choice of style

Minimalism in order to make interaction with website simple and eliminate any distraction to increase user`s focus.
Gamification because it is increase user`s interest to this process and add some motivation with desire to achieve goals.

5.1.3 Color solution

Most common and default colors are red, grey, black and white. The reason why we chose red is because it personifies power, breakthrough, will to win, as a rule it is chosen by people who always achieve their goal, it contributes to a statement of strength and opportunity. The gray color is used to dilute this red color. Black and white colors to make design minimalistic.
Additional to that you can buy another color in market and use them instead of red for the header and buy other avatars that also vary in color.
Tasks will have their own colors depending on their priority.

5.2 Location of interface elements

Our website is divided into three sections - header, aside and main.
As is customary in 2D games, the life bar, coins, and avatar are located at the very top, in our case in the header. Where there are also buttons for setting up, selecting the calendar type, add a task, and notification, for quick access to them.
In the aside there are sections when you click on which the main section changes, so it is located next to the main section, not at the top and not at the bottom, so that you do not have to scroll the page once again.

The main section can display a calendar in different formats, a to-do list, and a store where you can buy things. Only side and header can activate different types of main, so it stands to the left of the calendar, and lower than the header.

5.3 Ergonomics

Simple and standard navigation. Intuitive icons. Suitable color palette. Soft messages when authorization and when error occurs. Smooth animations. Readable fonts with sizes.

5.4 Target audience

5.4.1 Age of users

14-65

5.4.2 Their mood, temperament, etc.

Who will use: Fans of planning their own business, fans of rpg games, who prefer that all plans are always at hand, who prefer to write down their affairs right away.
Their mood can be: Optimistic, passionate, invigorated, serious, reflective, tense, restless, hopeful, combative.
When they could use: In the morning to plan the day or remember what you planned for today, in the afternoon during some work, at night before going to bed to reflect or plan the day for tomorrow and when you're free and you want to plan a big deal.

6 ECONOMIC RATIONALE

6.1 Developing of IS business plan

Connection and use of the site's services will be possible only by subscription through which our client will receive income. All cost calculations are presented in the following paragraphs.

6.2 Calculation of IS cost

6.2.1 Calculation of cost estimates

Additional Project Cost			
Item Name	Expenses	Amount	Total
Domen Name, yearly	24 000,00 ₸	1	24 000,00 ₸
Hosting, yearly	120 000,00 ₸	1	120 000,00 ₸
License	35 000,00 ₸	1	35 000,00 ₸
Protection from DDoS attaks, yearly	168 000,00 ₸	1	168 000,00 ₸
SMM services from a third-party company, for 1 year	2 400 000,00 ₸	1	2 400 000,00 ₸
YouTube Ads (pay per click) for 1 year	55,00 ₸	100000	5 500 000,00 ₸
SSL-certificate	40 000,00 ₸	1	40 000,00 ₸
BitDefender GravityZone Business Security, yearly	112 000,00 ₸	1	112 000,00 ₸
Total			8 399 000,00 ₸

Picture 13. Additional costs

6.2.2 Calculation of IS development costs

Name of Task	OE (optimistic estimation)	RE (realistic estimation)	PE (pessimistic estimation)	Expected estimation value (size of project activity)
Analysis (identifying	64	80	96	80
Design (prototype on Figma)	16	24	32	24
Main page (Navigation)	8	16	24	16
Registration & Login page	8	16	24	16
Personal page (CRUD todo + Header)	32	48	64	48
Calendar page (3 Types of View)	32	40	48	40
Store page (3 Types of Products)	32	40	48	40
Settings page (Set account)	16	24	32	24
Creating Database (Connection web pages to database)	24	32	40	32
Testing & Debugging	16	24	32	24
Deployment	8	16	24	16
Maintenance and Promotion	16	24	32	24
			Total	384

Picture 14. Expected estimation of hours

Identified Risk Factor	Probability of Risk Factors = V1	Impact of Risk Factor = V2	Cost of Risk Factor = V3 = V1*V2
Security Misconfiguration	8%	512 800,00 ₸	41 024,00 ₸
Sensitive Data Exposure	13%	329 300,00 ₸	42 809,00 ₸
Cross-Site Scripting (XSS)	20%	405 500,00 ₸	81 100,00 ₸
Total			164 933,00 ₸

Picture 15. Cost of risk factors

Project per hours	384	hours
General labour rate	3300	tenge/hour
Actual work hour per day	8	hours
Actual days per week	5	days
Week per month	4	weeks
Work productivity per month (WPM)	160	W/h
Available workers per month	2	persons
Project effort	2,40	persons
Additional effort (Project change configuration)	0,5	persons
Total project effort	2,90	persons
Project duration	1,2	month
Project duration with additional efforts	1,5	month
Cost of project risks	164 933,00 ₸	
Project labour cost	1 267 200,00 ₸	
Total project cost	9 831 133,00 ₸	

Picture 16. Total project cost

6.3 Calculation of economic efficiency

Subscription for 1 user per month = 1 000tg
Approximate average number of users = 5 000
Revenue per year with average number of users = 12 * 5 000 * 1 000 = 60 000 000tg
Expenses for 1 year with promotion and with labour cost = 9 831 133tg
Taxes = 60 000 000 * 13% = 7 800 000tg
Net profit = revenue – taxes – expenses = 42 368 867tg

6.4 Building up its PR-campaign

6.4.1 Analysis of the market

The market analysis will be carried out by a third-party SMM promotion company whose services we decided to use.

6.4.2 Advertising campaign for the promotion of IS

The advertising of the site will also be carried out by a third-party SMM promotion company whose services we decided to use.

7 STAGES OF SOFTWARE DEVELOPMENT

1. Analysis: Identifying problem, finding a solution, writing technical and non-technical requirements from client, identifying risks and benefits.
2. Design: Making a choice of style, defining main colors, defining location of interface elements, creating a prototype in Figma.
3. Development: Site layout, adding animations, filling with content, development of the main application functions, creating database, connecting website to the database.
4. Testing & Debugging: Functionality testing, checking the usability of the site, performance test, security check, interface testing, UI testing, Debugging.
5. Deployment: deploying the site on the application server.
6. Maintenance and Promotion: Updating the application version, copying data, making changes to the code, promoting the site using Google advertising on YouTube, and on social networks using SMM.

8 IS TESTING AND DEBUGGING

8.1 Testing and Debugging IS

Intellij IDEA will be responsible for detecting syntactic, semantic, runtime errors. In Intellij IDEA there is a “test” folder there will be all the tests that are done manually. For incorrect data entry by the client, links leading nowhere, the vulnerability of the system to SQL injection is checked manually in the project itself in the “test” folder. The application is checked on the tomcat server, and Postman is used to test the operation of the application, as well as to send POST and GET requests. We will use method of manual testing.

8.2. Testing methodology

1. Functionality testing. Determining the data input and entry and test case execution.
2. Usability testing. For example, easy navigation, visibility and have everything that needs for better user experience.
3. Interface testing. There will be checked harmoniously running of three main components of a web application which are web server, web browser and database. Type checks whether there is

any interruption while the data is being transferred. Upon that, the communication taking place between various interfaces is also thoroughly checked.
4. Compatibility testing. Compatibility testing takes place at three levels which are browser compatibility, operating system compatibility and device compatibility.
5. Performance testing. In here, our web application is tested in terms of how better it can perform under stress conditions and heavy load. How the application is able to perform under different internet speeds, networks and browsers are also worked upon.

8.3. Testing for malicious code

Program will be tested for malicious code with BitDefender and supported with it.
BitDefender GravityZone Business Security - a bundle of security services designed for small and medium-sized businesses and combining #1 protection with simple centralized management of the protection of workstations and servers.

9 CONTROL AND ACCEPTANCE PROCEDURE

9.1 General requirements for IS acceptance

9.1.1 Deadlines

Start: 24.03.2022
End: 10.05.2022

Analysis: 03.04.2022
Design: 06.04.2022
Development: 03.05.2022
Testing & Debugging: 05.05.2022
Deployment: 07.05.2022
Maintenance and Promotion: 10.05.2022

9.1.2. Conditions of IS acceptance

Working site, without serious problems;
The database is connected;
All necessary tables have been created;
All kinds of important requests are executed(responded) correctly;
The design and logic of the site meet the requirements;
The importance of UX/UI design is taken into account;
The accuracy of the test results should be higher than 85%;
The program code is clear and corresponds to current templates;
The technologies used meet modern standards;
Possible problems with site security have been eliminated.

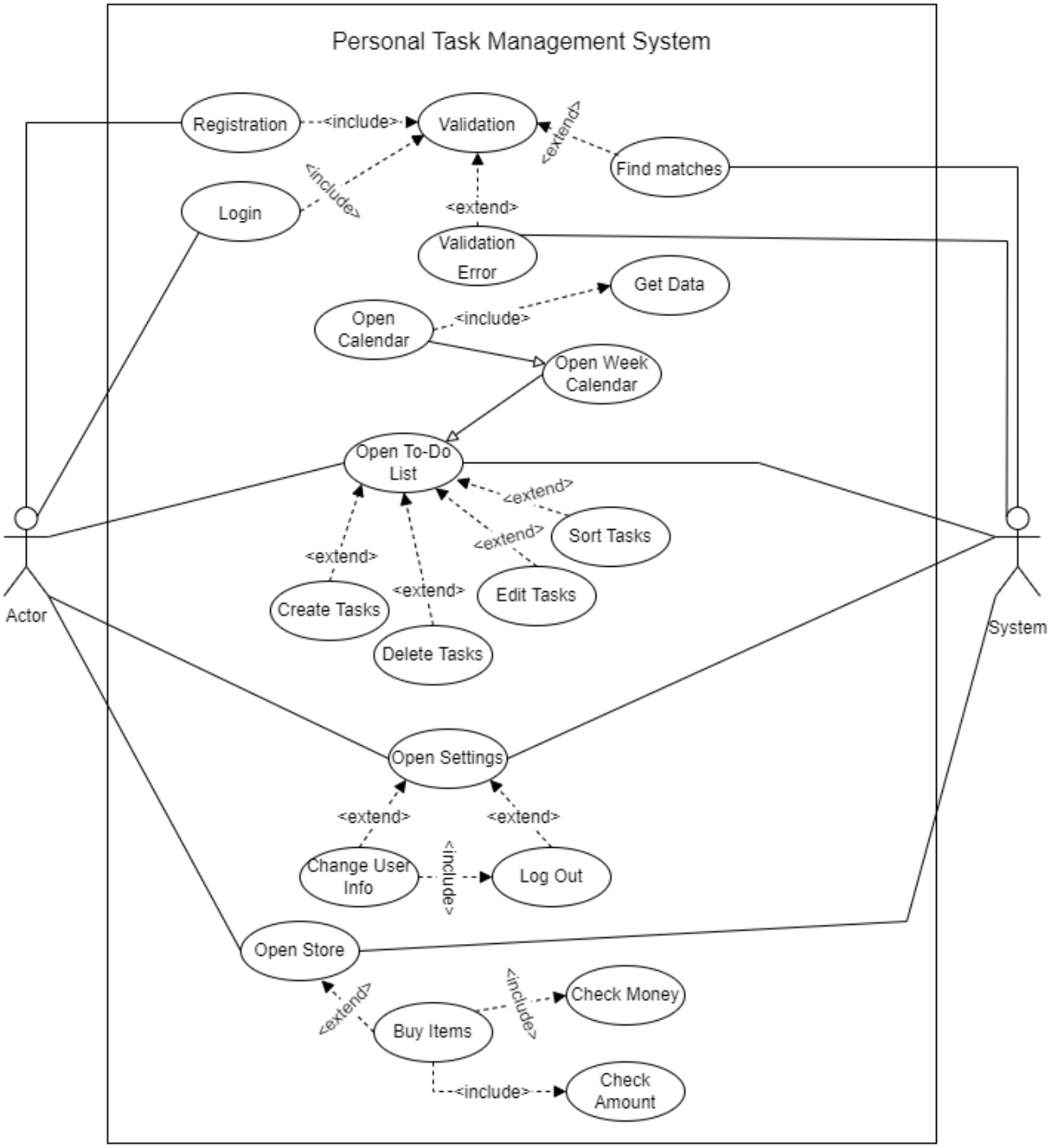
9.2. Test report

1. Functionality testing. Validation of user data and validation of tasks when they are created or updated works correctly.
2. Usability testing. Approved by client.
3. Interface testing. With small number of requests, it works well. Also, harmony of 3 parts approved by client.
4. Compatibility testing. Works totally fine on a lot of versions of browsers.
5. Performance testing. Test results showed that it fits to the necessary requirements given by client.

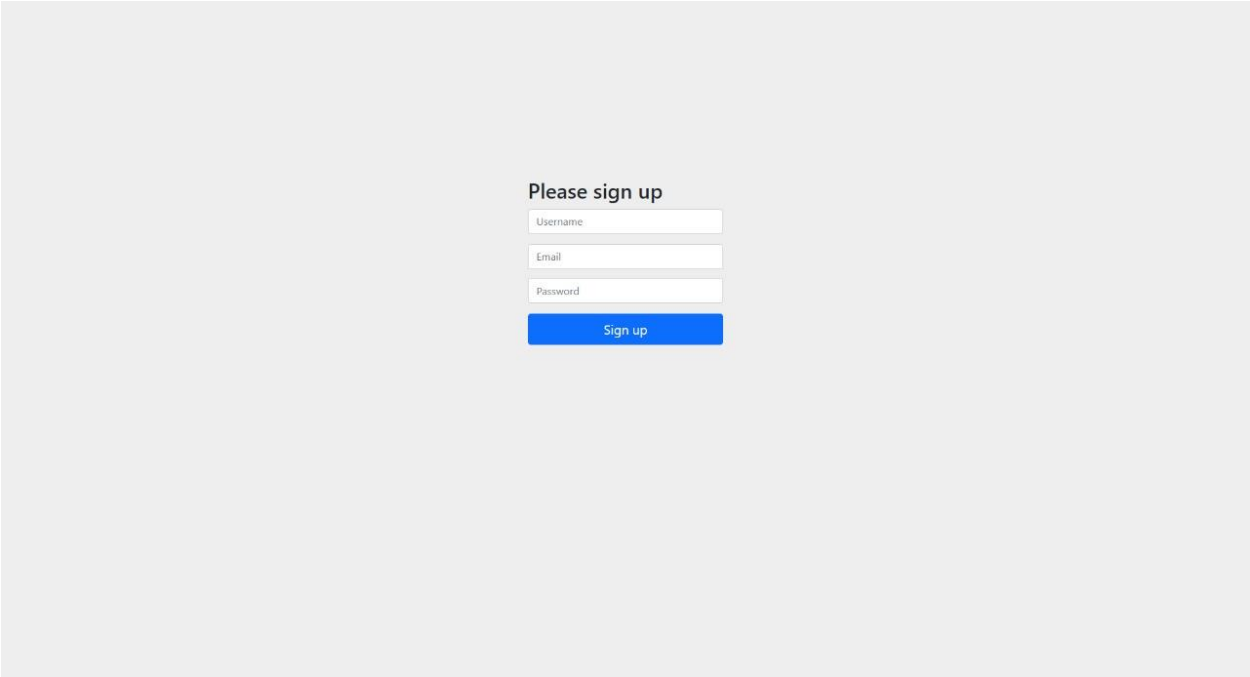
9.3. Acceptance Act

The problem to be solved is defined;
The solution corresponding to modern standards is provided;
Technical and non-technical requirements for the product are defined;
Risks and benefits identified;
The design is defined and agreed upon;
A prototype has been created based on the requirements;
A working layout of the site has been created;
The site was linked to a database;
The necessary tables have been created;
The required functionality of the site is implemented;
Testing methods are defined;
Testing was carried out with a good result;
The site was deployed to the server;
Problems related to site security have been solved;
Technical support has been hired to support the site;
Implemented website promotion using Google ads on YouTube;
Website promotion in social networks via SMM has been implemented.

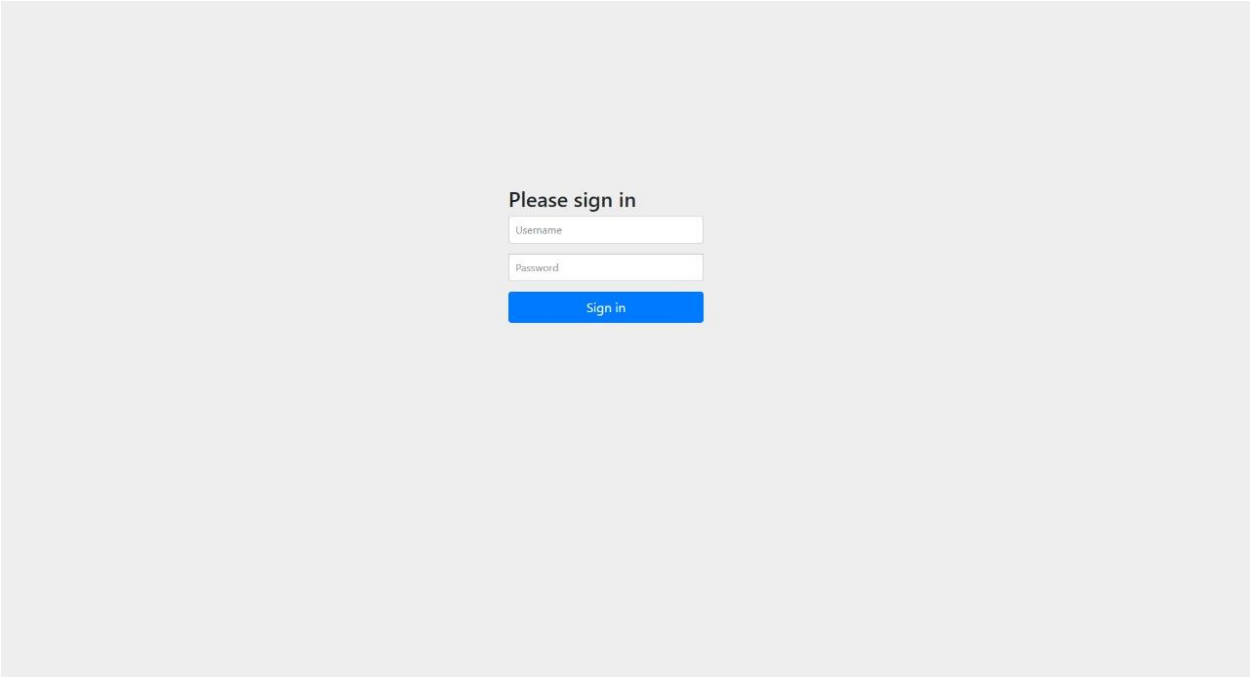
Additional files



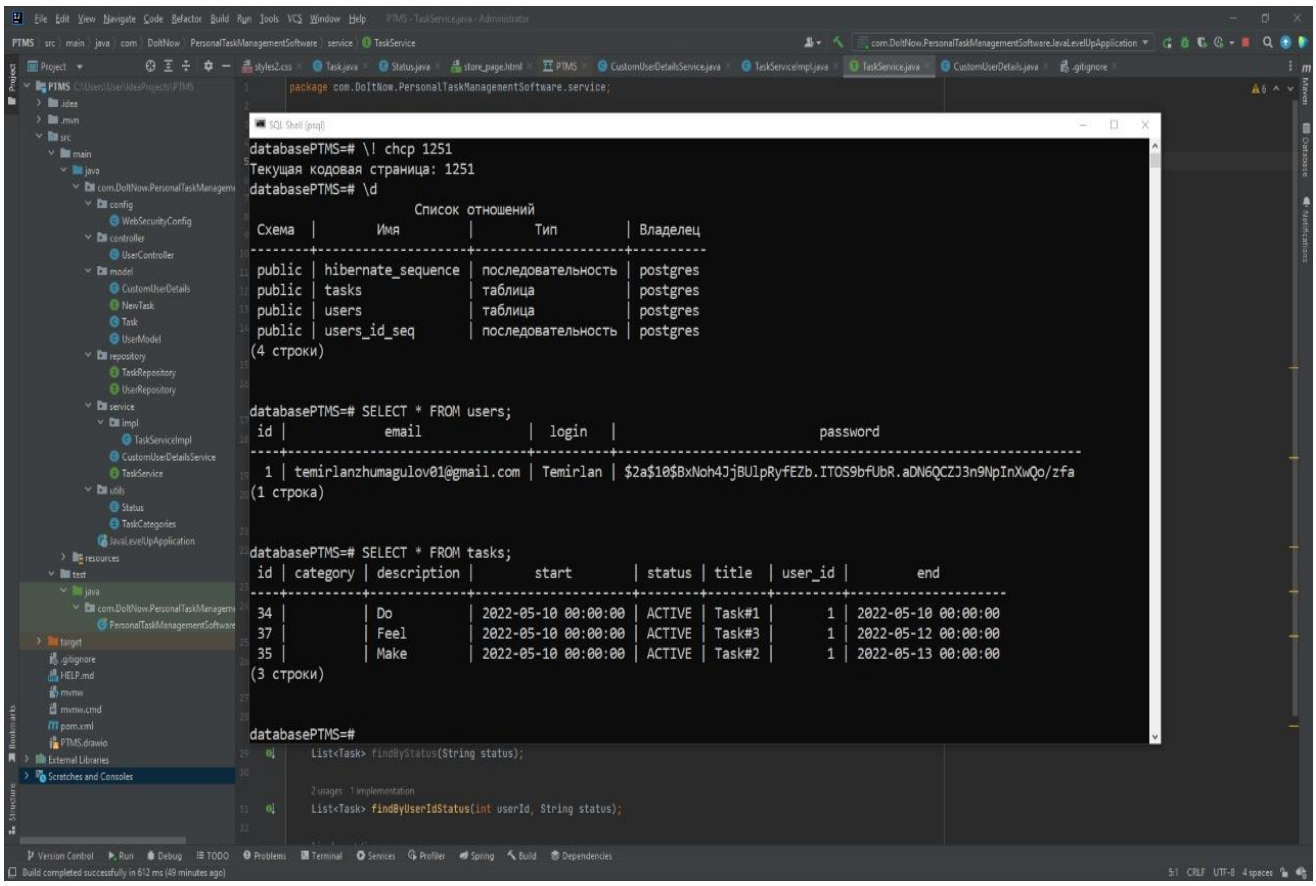
Picture 17. Use Case Diagram of PTMS

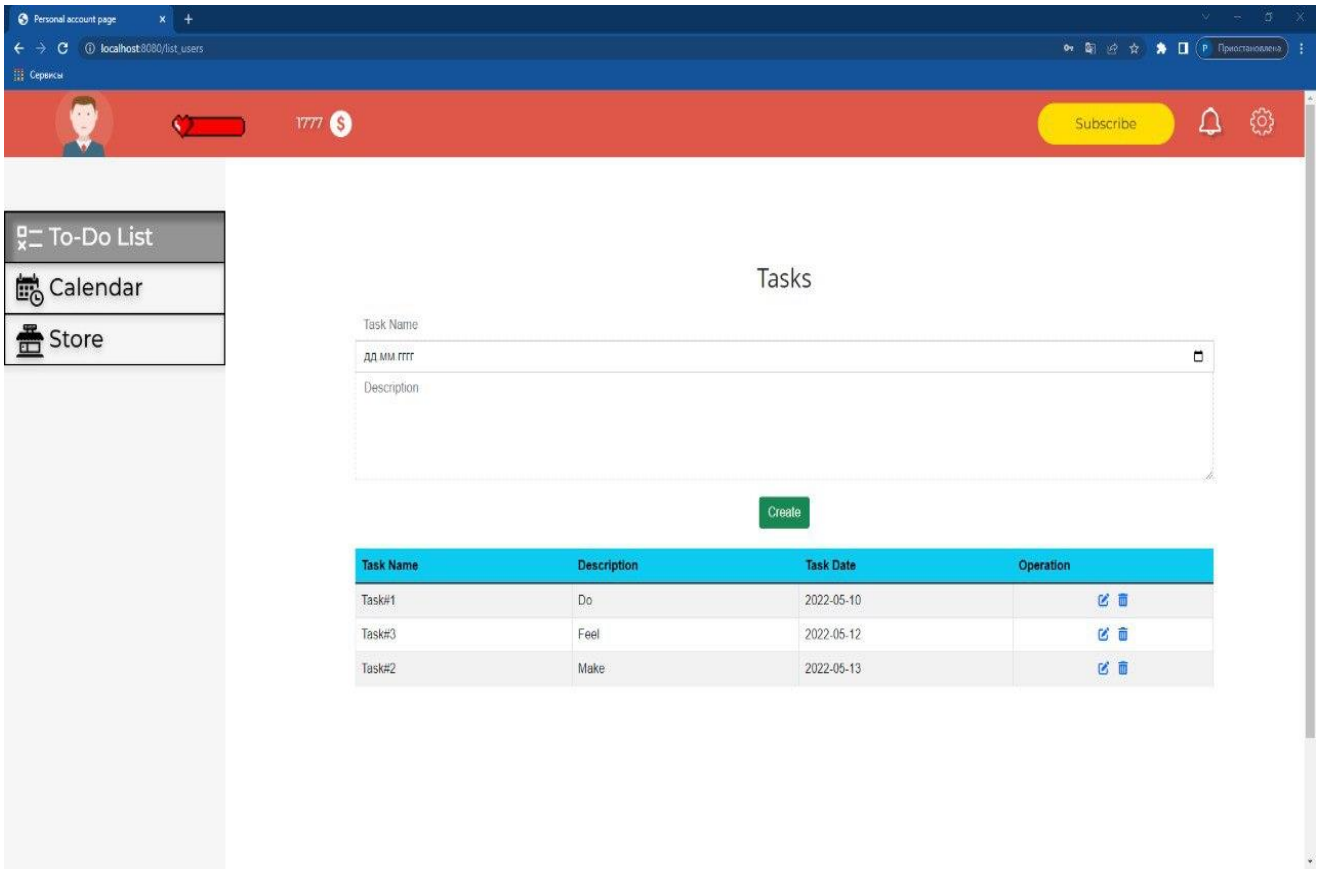


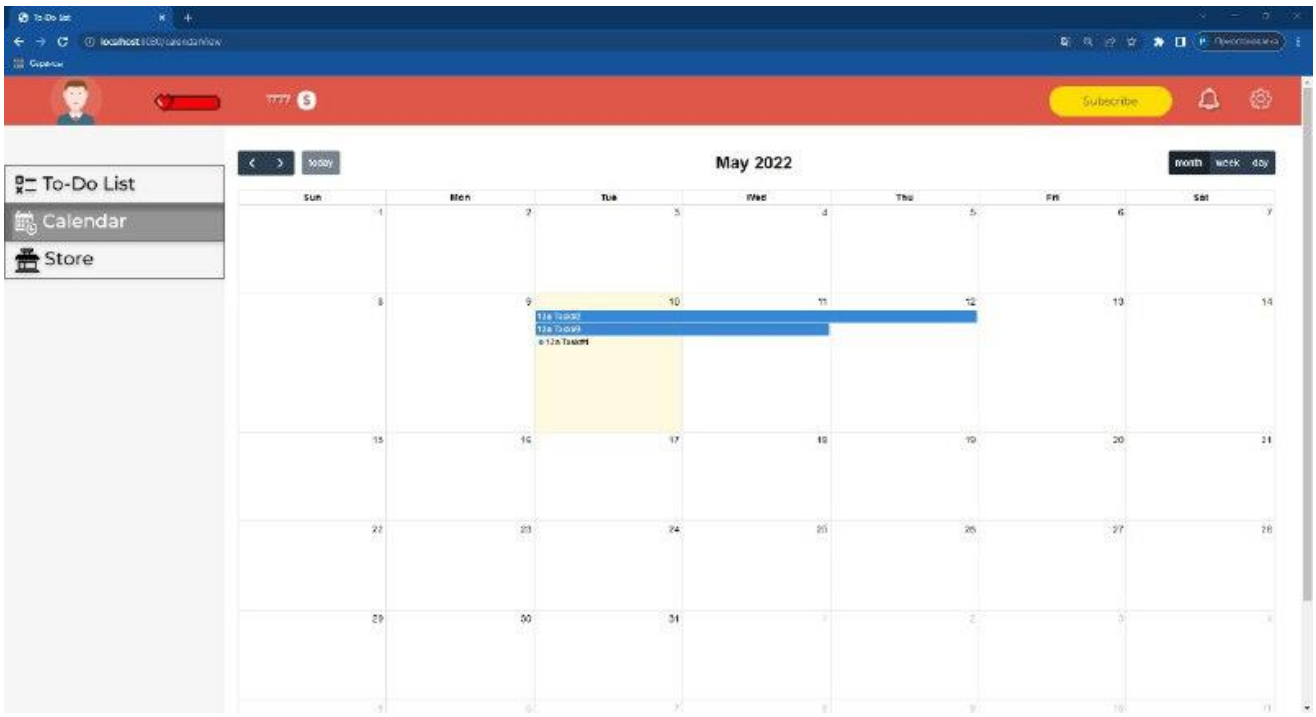
Picture 18. Sign up form

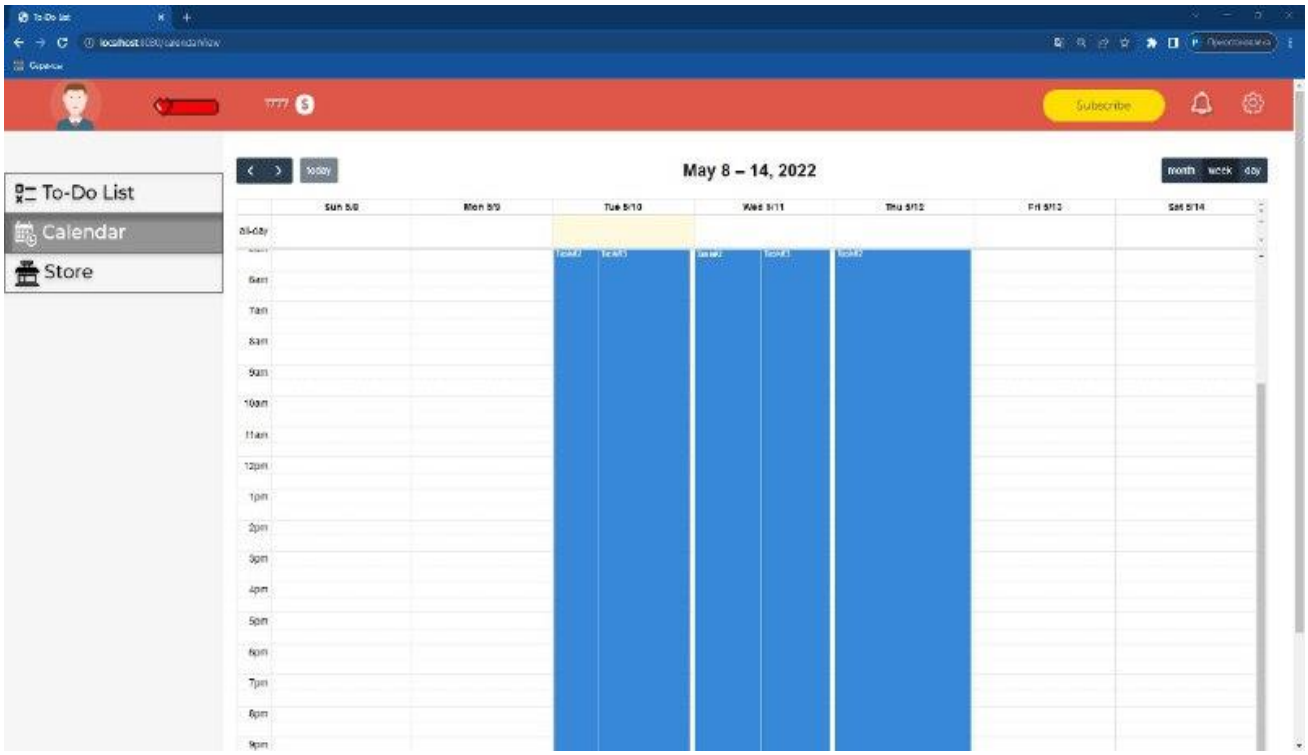


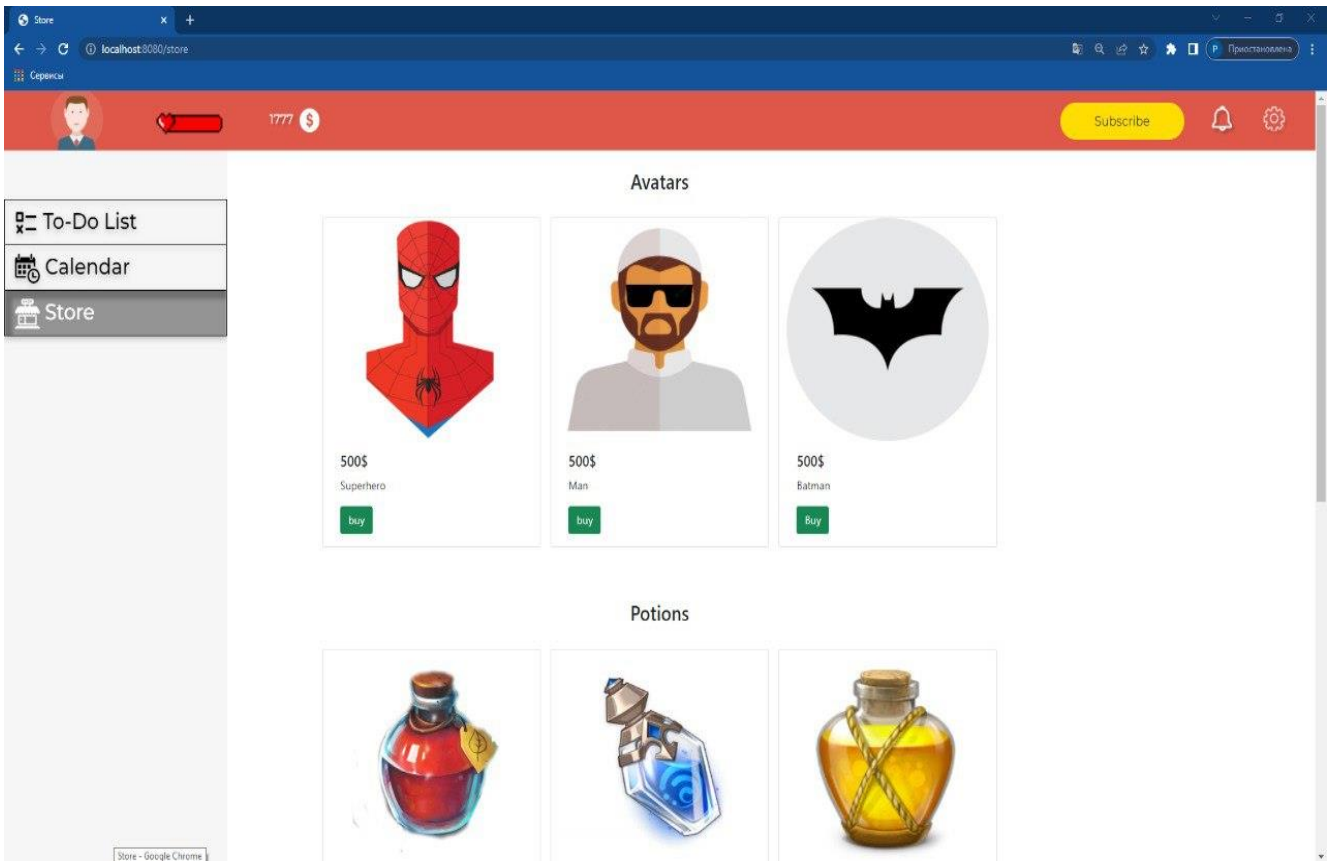
Picture 19. Sign in form

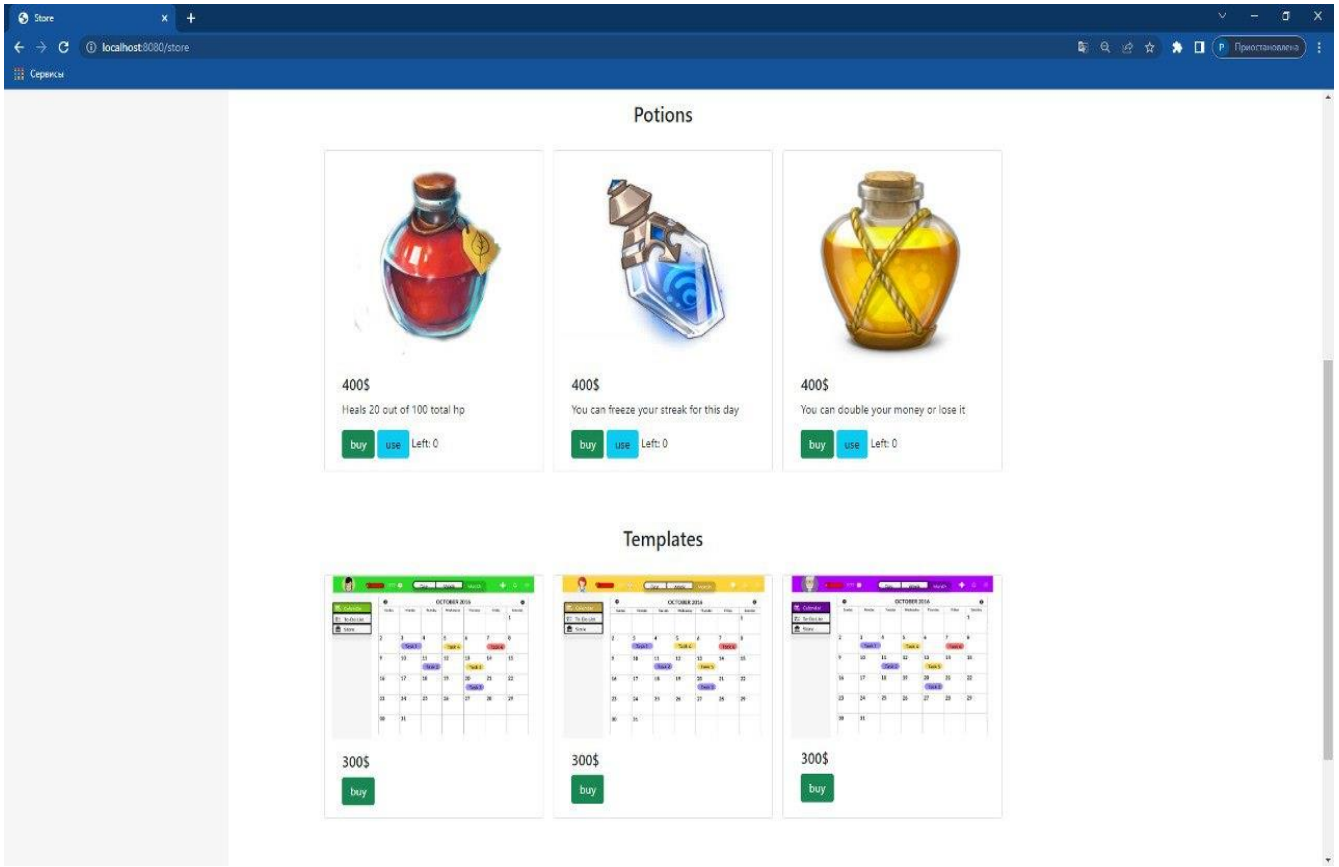

SQL Shell (psql)
databasePTMS=# \! chcp 1251
Текущая кодовая страница: 1251
databasePTMS=# \d
Список отношений
Схема | Имя | Тип | Владелец
public | hibernate_sequence | последовательность | postgres
public | tasks | таблица | postgres
public | users | таблица | postgres
public | users_id_seq | последовательность | postgres
(4 строки)
databasePTMS=# SELECT * FROM users;
id | email | login | password
1 | temirlanzhumagulov01@gmail.com | Temirlan | $2a$10$BxNoh4JjBUlpRyfEZb.ITOS9bfUbR.aDN6QCZJ3n9NpInXwQo/zfa
(1 строка)
databasePTMS=# SELECT * FROM tasks;
id | category | description | start | status | title | user_id | end
34 | | Do | 2022-05-10 00:00:00 | ACTIVE | Task#1 | 1 | 2022-05-10 00:00:00
37 | | Feel | 2022-05-10 00:00:00 | ACTIVE | Task#3 | 1 | 2022-05-12 00:00:00
35 | | Make | 2022-05-10 00:00:00 | ACTIVE | Task#2 | 1 | 2022-05-13 00:00:00
(3 строки)
databasePTMS=#

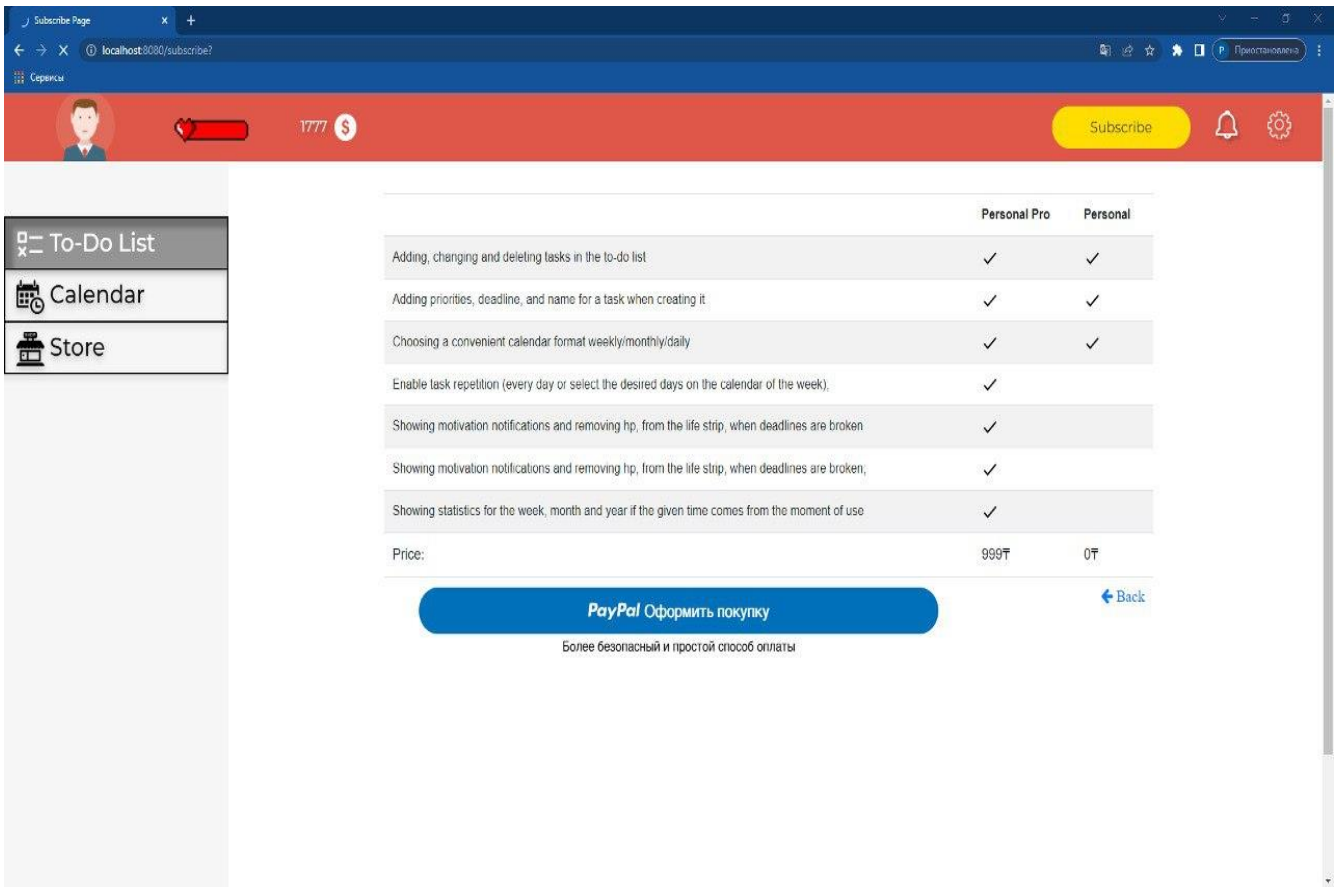

Personal account page
localhost:8080/list_users
1777
Subscribe
To-Do List
Calendar
Store
Tasks
Task Name
дд.мм.гггг
Description
Create
Task Name
Description
Task Date
Operation
Task#1
Do
2022-05-10
Task#3
Feel
2022-05-12
Task#2
Make
2022-05-13

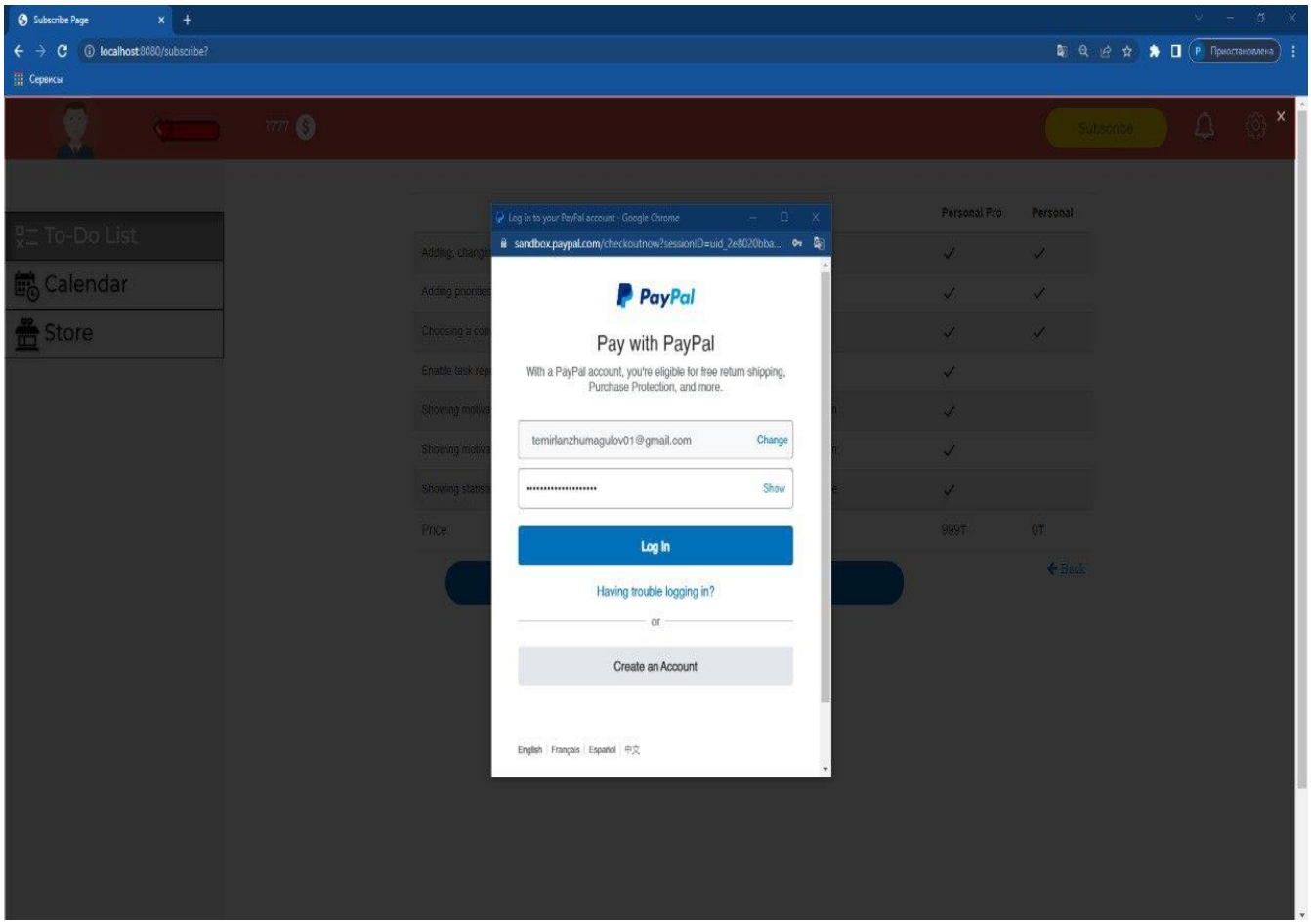

To-Do List
Calendar
Store
Subscribe
today
May 2022
month
week
day
Sun
Mon
Tue
Wed
Thu
Fri
Sat


To-Do List
Calendar
Store
Subscribe
today
May 8 – 14, 2022
month
week
day
Sun 5/8
Mon 5/9
Tue 5/10
Wed 5/11
Thu 5/12
Fri 5/13
Sat 5/14
all-day
6am
7am
8am
9am
10am
11am
12pm
1pm
2pm
3pm
4pm
5pm
6pm
7pm
8pm
9pm


Store
localhost:8080/store
Сервисы
Приостановлена
1777
Subscribe
To-Do List
Calendar
Store
Avatars
500$
Superhero
buy
500$
Man
buy
500$
Batman
Buy
Potions
Store - Google Chrome


Store
localhost:8080/store
Сервисы
Приостановлена
Potions
400$
Heals 20 out of 100 total hp
buy
use
Left: 0
400$
You can freeze your streak for this day
buy
use
Left: 0
400$
You can double your money or lose it
buy
use
Left: 0
Templates
300$
buy
300$
buy
300$
buy


Subscribe Page
localhost:8080/subscribe?
Сервисы
Приостановлена
1777
Subscribe
To-Do List
Calendar
Store
Personal Pro
Personal
Adding, changing and deleting tasks in the to-do list
Adding priorities, deadline, and name for a task when creating it
Choosing a convenient calendar format weekly/monthly/daily
Enable task repetition (every day or select the desired days on the calendar of the week).
Showing motivation notifications and removing hp, from the life strip, when deadlines are broken
Showing motivation notifications and removing hp, from the life strip, when deadlines are broken;
Showing statistics for the week, month and year if the given time comes from the moment of use
Price:
999₸
0₸
PayPal Оформить покупку
Более безопасный и простой способ оплаты
Back


Subscribe Page
localhost:8080/subscribe?
Сервисы
To-Do List
Calendar
Store
Log in to your PayPal account - Google Chrome
sandbox.paypal.com/checkoutnow?sessionID=uid_2e8020bba...
PayPal
Pay with PayPal
With a PayPal account, you're eligible for free return shipping, Purchase Protection, and more.
temirlanzhumagulov01@gmail.com
Change
Show
Log In
Having trouble logging in?
or
Create an Account
English | Français | Español | 中文