

Ministry of Science and Higher Education of The Republic of  
Kazakhstan.  
Suleyman Demirel University



**SULEYMAN DEMIREL  
UNIVERSITY**

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**Educational platform and test platform of LLP  
"Boarding school "Zangar-M"**

A thesis submitted for the degree of  
Bachelor in Information Systems  
(degree code: 6B06101)

Kaskelen, 2023

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# Abstract

Information technology is developing every year. To facilitate some aspects of each field, scientists create innovative ideas and improve them every day. Following these rules, the educational market also does not stand still. In recent years, the market has been replenished with new solutions for online education. From the very peak was during the pandemic, when so many educational institutions faced online education. New platforms have emerged and existing ones have strengthened their market share. And there were schools or companies that created their own solution for this. The task of our company was in this. Create a local educational platform that makes life easier for many. This project should be interesting informational, and in addition with the ability to replace foreign platforms if something happens. In our documents, we described how our platform will work, what kind of architecture we have, what tasks we faced and whether then. We will also discuss the cases of some companies that are moving in this direction, and describe the process of releasing our product.

## **Андалпа**

Ақпараттық технологиялар жыл сайын дамып келеді. Әрбір саланың кейбір аспектілерін жеңілдету үшін ғалымдар инновациялық идеяларды жасайды және оларды күн сайын жетілдіреді. Осы ережелерді сақтай отырып, білім нарығы да бір орында тұрмайды. Соңғы жылдары нарық онлайн білім берудің жаңа шешімдерімен толықты. Ең шыңы пандемия кезінде, көптеген оқу орындары онлайн білім берумен бетпе-бет келген кезде болды. Жаңа платформалар пайда болды және барлары нарықтағы үлесін нығайтты. Бұл үшін өз шешімін жасаған мектептер немесе компаниялар болды. Біздің компанияның міндеті осымен байланысты болды. Көптеген адамдардың өмірін жеңілдететін жергілікті білім беру платформасын жасаңыз. Бұл жоба қызықты ақпараттық болуы керек, сонымен қатар бірдене болған жағдайда шетелдік платформаларды ауыстыру мүмкіндігі бар. Құжаттарымызда платформамыздың қалай жұмыс істейтінін, бізде қандай архитектура бар екенін, алдымызда қандай міндеттер тұрганын және ол кезде не болатынын сипаттадық. Біз сондай-ақ осы бағытта жүріп жатқан кейбір компаниялардың істерін талқылап, өнімімізді шығару процесін сипаттайтын боламыз.

## **Аннотация**

Информационные технологии развивается с каждым годом. Чтобы облегчить некоторые аспекты каждой сферы, ученые создают инновационные идеи и улучшает их каждый день. Следуя этим правилам образовательный рынок тоже не стоит на месте. В последние годы рынок пополнился новыми решениями для онлайн образования. С самый пик был во время пандемии когда очень многие образовательные институты столкнулись с онлайн образованием. Появился новые платформы, а существующие укрепили свои доли на рынке. А были школы или компании которые создали свои решение для этого. Задача нашей компании был и в этом. Создать локалную образовательную платформу, которое упростить жизнь многих. Этот проект должен быть интересным информационным, и в добавок с возможностью заменить иностранных платформ если вдруг происходит какие то случаи. Нашем документы мы описывали как будеть работать наша платформа, какая у нас архитектура, какими задачами мы столкнулись и тогда ли. Ещё мы будем обсуждать кейсы некоторых компаний который двигается в этом направлении, и описывается процесс релиза нашего продукта.

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# Chapter 1

# Introduction

## 1.1 Motivation

According to an article in the economist.kz the coronavirus pandemic forced a complete reformatting of the education sector in a short time. Countries were not ready for the transition to digital distance learning and faced great difficulties. As a result of the pandemic, schools were closed in 191 countries, affecting more than 90 of students worldwide, half of whom did not have access to a home computer, 43 did not have home Internet. Specifically, in Kazakhstan, when switching to distance education, out of 3 million schoolchildren, about 700 thousand (23) needed computers, although more than 250 thousand computers have been transferred to students for temporary use since the beginning of the epidemic. Children from low-income families, with special educational needs and primary school students needed technology.**[hulme2001african]**

Moreover, a number of pedagogs were not prepared to switch into the distance mode of education immediately; it took some time to provide workers with needed digital literacy training. A survey conducted among 1247 American teachers is also indicative: more than half of them did not feel ready to implement distance learning, 69 sent documents or printed pages with assignments to their students. Similar problems occurred in Kazakhstan, unlike large cities and their regions, Almaty and Astana, the rest of the country faced major problems, taking into the account that the lack of specialists in rural areas already existed. According to statistics, the percentage of highly qualified teachers in rural schools is lower than in urban ones. Only 18.5 of rural teachers have the highest qualification category, compared to 31.2 in urban schools. A quarter of teachers in rural (24.1) and urban (23.7) schools do not have a qualification category at all.

This resulted in the quality of academic performance of the schoolchildren, the research of the World Bank showed that the PISA (Programme for International Student Assessment) results similarly confirm differences in human capital levels across Kazakhstan – according to the study, low-performing regions lag behind high-performing regions by an average of 4 years of schooling, performing poorly

in both rural and urban schools, while in the regions with the highest academic performance show the largest gap between rural and urban schools.

Taking into account all this information we wanted to participate in the enhancement of education of Kazakhstan. In addition, during the distance mode of study, due to the pandemic, one of the members of our team, Dastan Talipov returned back to his home, Zhuynek village in Turkestan region. He started working at the one of the only two existing schools of Zhuynek district - Zangar-M as an educational coordinator. Since 2020 he is still working there aiming to modernize Zangar M's management system. Therefore, we decided to create an e-learning platform to support effective digital class facilitation and communications between all the stakeholders.

## 1.2 Aims and objectives

LLP "Zangar-M" is a private school-internat located in Zhuynek district, Turkestan region, that is a union of three villages: Zhuynek, Shypan and Shekerbulak with the population of 5242 people, according to the 2009 census. In this district, currently, only two schools providing secondary education. In 2021, September, LLP "Zangar-M" moved to a new building in the village of Zhuynek, Sauran district, Turkestan region, and further developed into a general education boarding school for 420 students, fully covering the 1st-11th grade. The school is modernizing its equipment, including computer science, biology and physics laboratories. In addition, as part of this transformation, LLP "Zangar-M" needs a development of an e-learning platform in order to provide more efficient education delivery and its management. Furthermore, this platform will allow this school to enroll children from the villages around, in the online format, freeing them up from having a long commute to the school and providing access for high quality education.

Preliminary analysis of the existing processes showed that the platform should facilitate three main processes: learning, class facilitation and quality assurance. With the next end users also divided into three categories: first, children who are enrolled in the curriculum and their parents, second, prospective students and their parents, and the third, school's teachers and management.

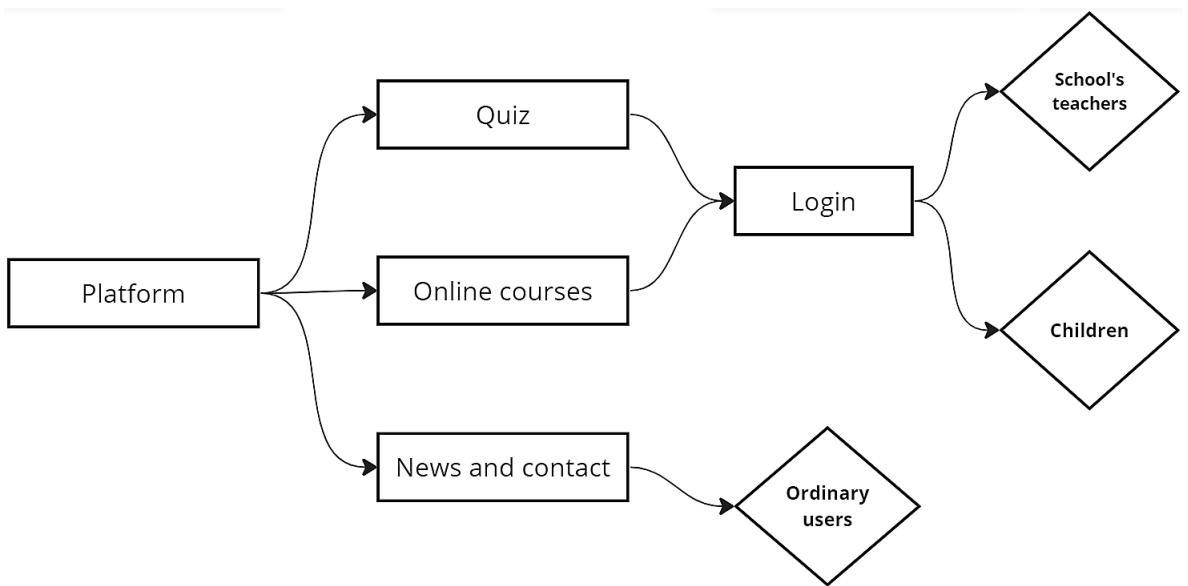


Figure 1.1: Scheme for site users

Therefore, with the client we decided to design a platform with three modes of user logins: 1. Admin, 2. Student, 3. Ordinary users. In addition, the part of the site that includes marketing related information will be seen for all individuals

Logic of the plattform

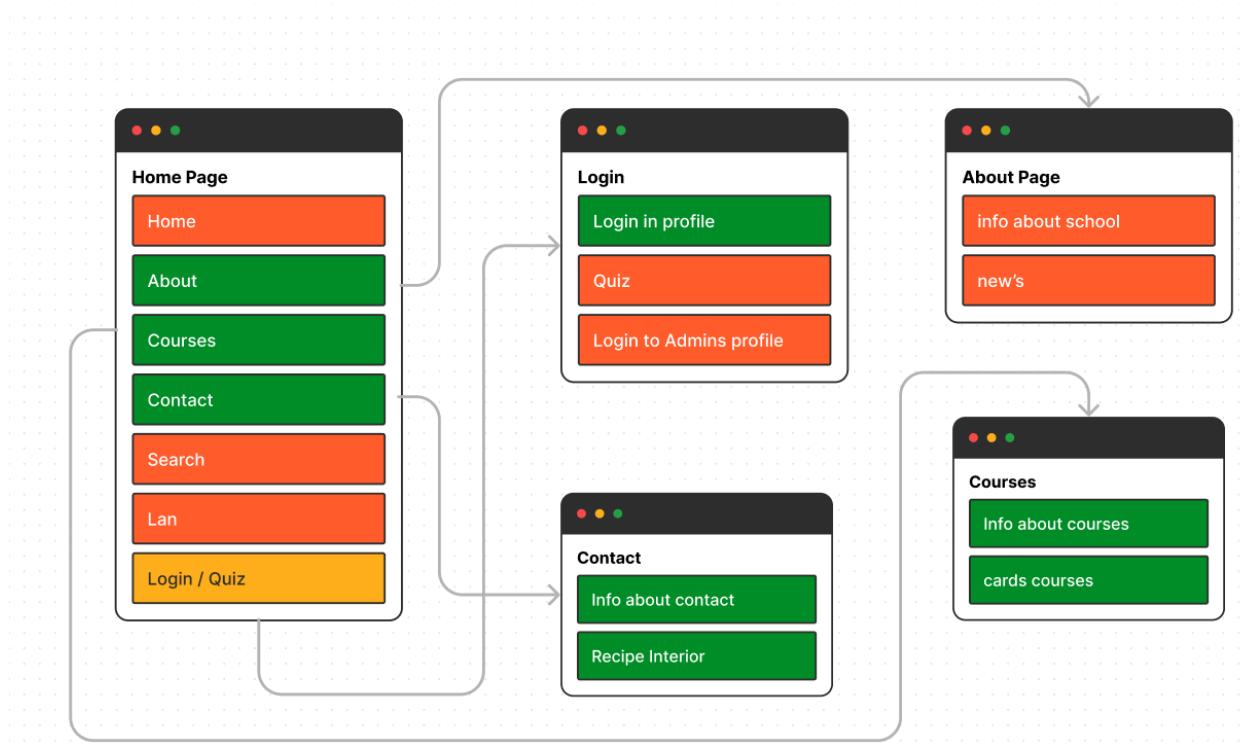


Figure 1.2: Sitemap

The first type of users are ordinary users. When they visit this site, they can get information about the school and see what courses are available. In addition, ordinary users can submit their comments and questions in the comments box

located in the contact section of the site, and leave their email address there for a response. In the near future, the school administration will respond to the user by email.

The second type of users are students. The school administration will open one email address for each student, and students will be able to access the site, take tests and take courses only through this email address. After passing the test, students can see their ranking among students.

The third type of user is administrators, who are often teachers. They create tests and courses for schoolchildren. They can have two to six options in the test build panel. Administrators enter the start and end time of the test, the number of retakes, the name of their subject and the topic of the test. The admin can open the quiz to show students the correct answers when they're done, or close the quiz so they can't see the answers. In addition, administrators can download courses. It includes course videos, course files, and course-related quizzes.

## 1.3 Thesis Outline

This manual is broken up into 5 chapters. The reason for why and how we choose a theme for this project is explained in the introduction chapter. Background information about the project's subject is provided in this chapter. Chapter 2 contains an introduction to the problem and describes the goals and objectives of our project. In addition, it tells what problems our project solves and the progress of work. Chapter 3 explains in detail the role and work done by the group members. The works of the group members are supplemented with photos and screenshots. In addition, it will be told about the testing of the site, its results and how it affected people. And chapter 4 will tell you what level the site will reach in the future and what features to add more. The last chapter will show the result of the platform we created. In general, it is worth dwelling on the pros and cons of the site and noting that, in general, our work ended productively.

## 1.4 Literature review

A literature study is an important phase in the development of an educational platform that will help it achieve its goals. A detailed examination of previously published works on the topic is included in a literature review, which forms the basis for identifying knowledge gaps and guiding the platform's development[6].

Additionally, comprehending the discourses helps to pinpoint industry best practices, gaps, and opportunities to direct the creation of educational platforms. The evaluation helps developers avoid common pitfalls and succeed by highlighting the advantages and disadvantages of earlier platforms. As a result, a platform that is more effective, efficient, and fits the demands of educators and learners is created.

The requirement for pupils to have access to digital devices and a dependable Internet connection, which may not be available to all students, are additional problems associated with technology. Technology-related problems like network outages and platform failures can also impede learning. Online learning platforms can increase student engagement and output, according to study findings. As an example, in the US Department of Education's study, students who attended online courses did better than those who took traditional classroom courses. Additionally, it has been discovered that e-learning platforms that offer personalized feedback, interactive learning resources, and multimedia resources increase student motivation and engagement.

Several studies have investigated the effectiveness of school websites in enhancing student learning outcomes. In a study by Khan and Sheikh (2016)[9], the authors found that school websites have a significant impact on student learning outcomes, with students reporting higher levels of motivation and engagement in learning activities. The study also found that students who had access to online resources through school websites had better academic performance than those who did not.

The latest trend in academic circles has been the rapid and significant growth of online or distance learning courses. This type of research is good for revisiting past lessons. Students can see lessons at any time in the evening or in the morning, they can watch this lesson as much as they want. And after each lesson there will be a test to check the progress of students. In this way we want to improve the quality of students' knowledge[4].

Overall, the use of school websites has numerous benefits for students, teachers, and parents. They provide a platform for students to access educational resources, improve communication between stakeholders, enhance student engagement and motivation, and facilitate personalized learning. Furthermore, research has shown that the use of school websites can lead to improved academic achievement and learning outcomes. Therefore, it is essential for schools to incorporate websites into their educational practices to provide the best possible learning

# Chapter 2

## International and local cases analysis

In order to further develop the project, a comprehensive case study analysis was needed. For such analysis we decided to use four international cases, to list: Moodle, Coursera, Classroom, and Huawei partners, as well as we reviewed four Kazakhstani projects: BilimLand, Daryn.Online, Opiq and kundelik.kz.

### 2.1 International cases

First of all, we looked through e-learning websites that have international applications. For discussion, we chose the platforms Moodle, Coursera, Classroom and Huawei Talent.

	Description	Online course	Quiz	Attendance	Chat	Grades	Homework
<b>Moodle</b>	E-learning	Yes	Yes	No	Yes	Yes	Yes
<b>Coursera</b>	Online learning	Yes	Yes	No	No	Yes	No
<b>Classroom</b>	E-learning	Yes	Yes	No	Yes	Yes	Yes
<b>Huawei Talent</b>	Online learning	Yes	Yes	No	No	No	No

Figure 2.1: Table for International cases

Moodle[7] is a world famous e-learning platform. It is an open source learning management system that allows educators to create and deliver online courses to students around the world. According to our analysis, the Moodle platform lacked only the "attendance" function. Like Moolde, the other three platforms do not use the "attendance" feature. On the Coursera[2] platform, course participants cannot chat with each other. Only online courses and quizzes can be taken on the

Huawei Talent platform. One of the advantages of the Huawei Talent[8] platform is that at the end of the course, the best students receive a certificate.

## 2.2 Local cases

We chose BilimLand, Daryn.Online, Opiq and kundelik.kz [3] platforms to discuss local online learning platforms. These platforms operate at the highest level in Kazakhstan. When discussing these platforms, we mainly focused on aspects related to our site.[11]

	Description	Online course	Quiz	Attendance	Chat	Grades	Homework
<b>BilimLand</b>	E-learning	Yes	No	No	Yes	Yes	Yes
<b>Daryn. Online</b>	Online learning	Yes	Yes	No	Yes	Yes	Yes
<b>Opiq</b>	E-learning	Yes	Yes	Yes	No	Yes	No
<b>kundelik.kz</b>	Student assessment platform	Yes	No	Yes	Yes	Yes	Yes

Figure 2.2: Table for Local cases

The BilimLand[1] online platform does not use the quiz and attendance features. The Daryn.online platform fully meets all the requirements, but this platform also lacks the “attend classes” function. The chat and homework features are not used in the Opiq[10] learning platform. And kundelik.kz is the most widely used platform in our country. This platform uses the functions of taking online courses, attendance, grading, and assigning homework.

Based on this analysis, we decided to add a few more features to our site and create a platform that meets modern requirements.

## 2.3 Problem statement

Online learning has undergone a considerable shift as a result of the COVID-19 epidemic, and this tendency is probably going to continue. While this has given students new opportunities to access educational materials and resources from the convenience of their homes, it has also presented a number of difficulties for many students. An instructional website may encounter a number of major issues, including:

1. Insufficient performance. which may lower the standard of instruction and testing.
2. Security Concerns.security issues including fraud, phishing, and hacking that could cause the site’s reputation to suffer.
3. Technical difficulties.delays and errors that could make it challenging for users to use the service, including

instructors and students. 4. Sluggish download rates. Users may become angry as a result and have a worse time utilizing the website. 5. Poor optimization for mobile. This can make it difficult to use the site on mobile devices, which might make the site less enjoyable to use.

Fixing some of these problems:

1. Software updates: Improving performance, security, and functionality of website software can lower downtime and enhance user experience. We'll keep the website up and running, correct any issues, and optimize it. This is the day's work: keeping the site up and running, correcting any errors, and optimizing it.

2. Design and navigation: Users can access information and complete desired tasks on the site more quickly with better site management and improved design.

3. Functionality: By including new features like support for video tutorials, better tests, a better grading system, and many others, the website can enhance learning and draw in more visitors.

4. Security: Additional security measures, such two-factor authentication and data backup, can safeguard user data and shield the website from potential threats.

5. User Education: Users can use the site's capabilities more effectively and handle issues that may emerge by receiving training materials and support.

# Chapter 3

# Methodology

## 3.1 Introduction

In this chapter, we are describing the detailed process of creating a project, the division of responsibilities between team members, our requirements, and the implementation of the project itself.

The source code: [github](#)

One of the main benefits of using web pages for the school is improved communication between parents and administration. Parents can access information about the school, class schedule, grades, homework, and other important school events. This improves the participation of parents in the life of the school and helps them to be more involved in the educational process of their children. In addition, the use of online platforms can also improve the quality of learning. Teachers can use online lessons, video lectures, interactive assignments and other modern technologies for more effective teaching. The online platform can also be useful for sharing information and experience between teachers and others open in the field of education.

Finally, the use of online exams and a scorecard can help teachers assess knowledge more accurately and improve the learning process. Online exams can also be more convenient and cost effective as they can be automated and do not require large paper and stationery costs.

Our project aims to create a website for schools that utilizes modern technology in order to improve communication and teamwork between schools, students, teachers, and parents. The following are the website's primary characteristics:

- Online education: The website will support online learning by giving pupils useful learning materials and tools that they can use anywhere they have access to a computer or smartphone.
- Monitoring and assessing students: The website will provide up-to-date information on students' performance, such as test results, scores, and attendance records, enabling schools to keep track of and improve students' growth.

- Online testing: Instructors can create and give tests and activities using the website, and the results are reviewed and recorded right away for analysis.
- Realization plan: Research and prerequisite gathering from schools, instructors, students, and parents will be done as part of the realization plan to make sure the website satisfies their needs and expectations.
- Design and development - We will use cutting-edge tools and features, a safe and scalable web framework, an intuitive and user-friendly user interface, and other contemporary design and development techniques to create the website.
- Testing and quality assurance - Before the website goes live, we'll give it a comprehensive test run to make sure everything works as it should and that it complies with all security and quality requirements.
- Deployment and guidance - To ensure that the website is used effectively and promptly, we will distribute it to schools and offer continuous technological support and training. With the tools and resources they require to enhance communication, teamwork, and student learning results, the website will be a useful resource for schools and the larger educational community.

The goal maximum of the project is to create a comprehensive, user-friendly and feature-rich website that addresses the communication, teaching, evaluation and monitoring needs of schools. The website should offer an intuitive interface for teachers to create online tests, monitor results and view progress. It should also provide real-time information about school changes, news, and performance data to all stakeholders, including students, parents, and administrators. The website should be scalable and secure, and should be able to integrate with other existing school systems.

## 3.2 Roles distribution

Before the start of the project, each team member took a role that could correspond to their individual abilities.

Dastan Talipov - Full-Stack Developer  
 Abdubossit Abdulatipov - UI UX designer  
 Mamurzhan Tazhimuradov - Front-End + tester  
 Rauan Shurenbay - Project manager + Business analyst  
 Osmankulov Mirzakhid - Back-End

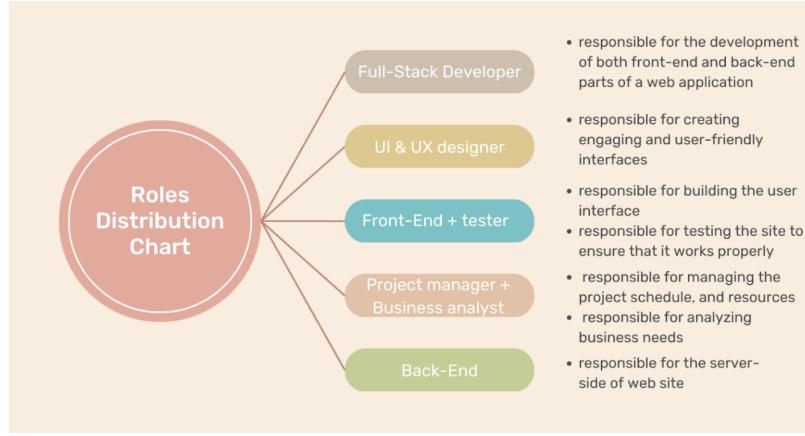


Figure 3.1: Position responsibilities explanation

### 3.2.1 Full-Stack developer

- The front-end and back-end components of the website, as well as their upkeep, fall under this responsibility. This includes creating user interfaces, putting business logic into place, and establishing connections to databases and APIs.
- The ability to develop clean, effective, and maintainable code that complies with industry standards is required, as well as proficiency in a variety of programming languages and technologies.
- Ensures the website complies with business needs by working closely with stakeholders and designers.
- Accountable for building and changing tables, streamlining queries, and guaranteeing data security in databases. The ability to integrate the most recent web development trends and technology to their job as necessary.
- Possibly in charge of providing end users with technical support, including problem-solving and troubleshooting. The entire web development process, from initial planning and design to implementation and maintenance, is the responsibility of a Full-Stack developer. They must be able to work well with others in the team, produce clean, effective code, and keep up with emerging trends and technology.

### 3.2.2 UI designer

- Responsible for designing user-friendly and aesthetically pleasing visual elements such as icons, buttons, and layouts.
- Creates standards to preserve uniformity in product design, from color palettes to typography

- Mockups and prototypes of the product are made to make sure it is both aesthetically pleasing and user-friendly.
- Work with developers to make sure the product is created in accordance with design specifications and that all design aspects are correctly integrated.
- Checks the effectiveness and usability of the product design and makes adjustments as necessary.

### **3.2.3 UX designer**

- Carries out user research to discover needs, issues, and preferences of users.
- User personas are created to represent various user groups, their demands, and behaviors.
- Identifies the stages a user takes to fulfill a task or objective by creating user journeys.
- Wireframes and prototypes are made in order to test, iterate, and improve product design and user friendliness.
- Ensures that product design is appropriately implemented and user needs are addressed by working with developers.
- Usability testing is done to make sure the product is efficient and user-friendly, and improvements are made as necessary.

The task of designing appealing and user-friendly interfaces for digital products falls to UI and UX designers. UX designers concentrate on the complete user experience, from research to design to testing, as opposed to UI designers who are more concerned with a product's visual design. They collaborate to make sure the product satisfies consumer needs and offers a satisfying experience.

### **3.2.4 Front-end developer**

- User Interface Design: Front-end developers are in charge of constructing a web application's or website's user interface using HTML, CSS, and JavaScript.
- In charge of creating interactive elements using JavaScript and other front-end technologies, such as drop-down menus, sliders, and pop-ups.

- Collaborates closely with back-end developers to link the application's user interface with its back-end functions.
- Optimizing user interface performance is in charge of making sure the application loads quickly and reacts immediately to user activity.

### **3.2.5 Tester**

- The tester's job is to make sure the application adheres to the requirements and functions as intended.
- Responsible for creating test strategies and test cases that cover both functional and non-functional requirements for the application.
- Accountable for carrying out test cases and recording outcomes.
- Liable for locating program flaws and reporting them to the development team.
- Ensures that defects are repaired, the program is delivered on time, and it complies with quality requirements by working closely with the development team.

While testers are in charge of making sure the application works properly and complies with quality standards, front-end developers are in charge of creating the user interface and interactive features. In order to make sure that the finished product satisfies the needs of the consumers, both roles are crucial to the software development process.

### **3.2.6 Project manager**

- The project manager is in charge of creating project plans that include the project's goals, timetables, and resource requirements.
- In charge of organizing the project's entire team, including developers, designers, testers, and other stakeholders.
- Maintaining project progress and making sure it is on pace to achieve deadlines and objectives.
- Responsible for identifying and managing project risks, particularly those that could affect the project's success on a technical, financial, or other level.

### **3.2.7 Business analyst**

- Analysis of company requirements and the discovery of potential for enhancement or optimization are the duties of a business analyst.
- The person in charge of collecting and storing needs from users, clients, and other business divisions.
- Creating project plans that detail the project's needs, scope, dates, and resources is their responsibility.

In the software development process, project managers and business analysts play distinct but complementary roles. Project managers are in charge of overseeing the project's timetable, finances, and resources, while business analysts are in charge of assessing client needs and compiling specifications to direct the development process. They collaborate closely to make sure the project is delivered on time, within budget, and in accordance with expectations for quality.

### **3.2.8 Back-end developer**

- Back-end developers are in charge of designing, building, and maintaining the application's back-end infrastructure as well as the server side of web applications. The following are some of the main duties of back-end developers:
  - Back-end developers use programming languages like Python, Java, PHP, and Ruby on Rails to design and create back-end components including APIs, online services, and databases.
  - To handle high traffic and data volumes, the server components of the application must be scalable and performant.
  - To connect back-end components with the application's user interface, back-end developers collaborate closely with front-end developers.
  - To ensure that the code is proper and complies with the criteria, he should test and debug it.
  - Accountable for overseeing the deployment of the application to the production servers and guaranteeing its availability and efficiency.

Being in charge of creating the infrastructure that supports a web application's user interface, back-end developers play a crucial part in the software development process. To make that the final product satisfies user needs and is delivered on time and within budget, they collaborate closely with frontline developers, testers, and other stakeholders.

### 3.3 Key Performance Indicators (KPI) Dashboards

The project team has opted for a flexible development methodology, specifically Agile. Agile is renowned for its flexibility and adaptability. In order to manage the project, the team has selected Scrum, a method that facilitates teamwork by organizing and managing tasks. The choice of Scrum is attributed to its convenience, which allows for the assignment of specific roles and simplification of tasks. To ensure effective task management, large tasks are divided into sub-tasks, and upon completion of one task, team members move on to another. The Scrum methodology involves daily meetings, known as 'stand-ups,' to update team members on their progress and future tasks related to project implementation. These meetings enable team members to identify and address any problems they may be experiencing.

To manage the sprints, the team utilized Trello, which proved to be an efficient tool. Team members were assigned weekly plans using Trello, and they would update their daily tasks in the evening. At the end of the week, the team reviewed the tasks completed and provided a weekly report. The experience of working with Trello was deemed pleasurable and efficient by the team

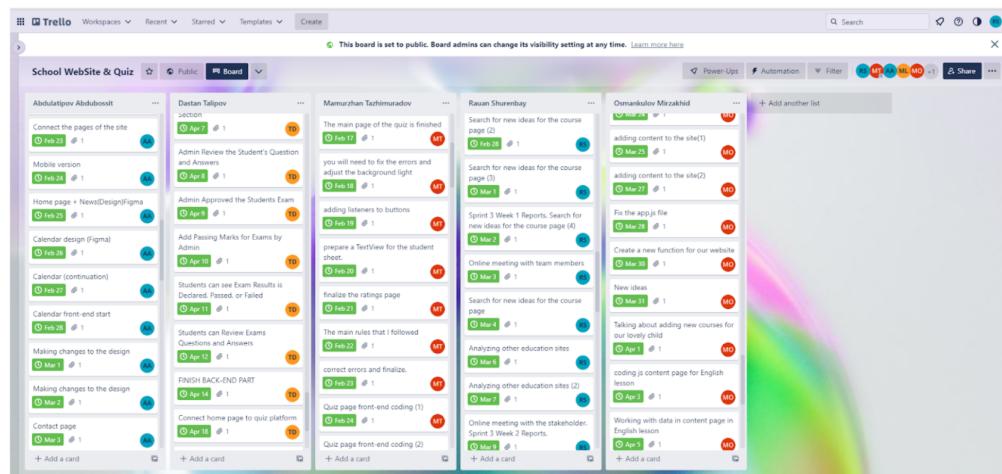


Figure 3.2: Works performed in Trello

Before starting the project, we discussed with the team what stages are ahead. To develop the platform, we had to go through at least 6 steps:

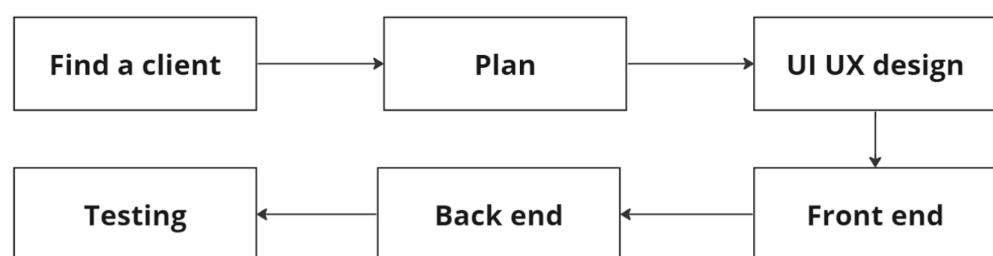


Figure 3.3: Progress of the site

After defining the overall project process, each team member has started the development of their own parts.

## 3.4 Design

The first step of our project's development was the work on the design part. The designer analyzed user behavior and the relationship between the logistics and the composition of the site's visual output, to make the site convenient for both users and administrators. The UI designer used a minimalistic design style for the site to correspond to the latest trends in the field and give the website a modern look. The design prototype was created by using UI UX platform - Figma.

**Color scheme:**

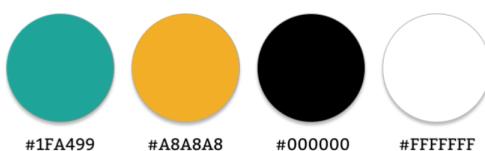


Figure 3.4: List of colors used

The color of the platform was white (000000). The designer used yellow (E9A825) and blue (1FA499) as the main colors for the design of the site. Another used color is black (000000). This was applied to colored fonts. The reason for choosing these colors is that the color of the logo presented by the school administration consists of these two colors.



Figure 3.5: School logo

White is the perfect color for minimalist design. The corners of all the buttons on the site are rounded by ten pixels. Added 20 percent shadow for buttons.



Figure 3.6: Design view of buttons

At the top of the "home" page there is a logo, a menu, a language change button and a "quiz" button in one line. The designer placed a photo of the best student of the school on the right side of the main page. The reason for posting this photo is that the school administration offered to place this photo on the main page. On the left side of homepage located the name of the school, the motto of the school and information about the school. The designer has used the bold and regular font "calibri" for use on the Site. The reason for using this font is that the school logo consists of two letters (ZM), and we chose this because the font "calibri" is very similar to the letters in this logo.

#### Typography:

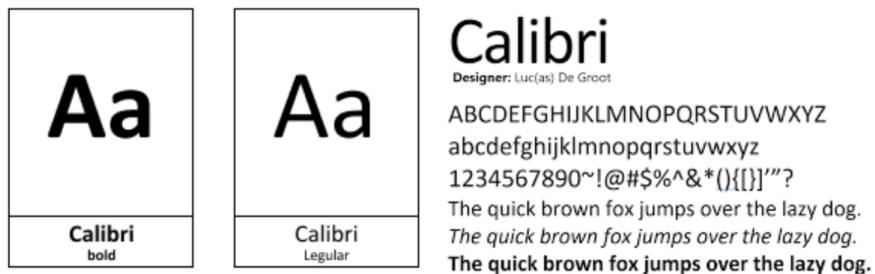


Figure 3.7: Font typography[5]

Course cards have also been created in the courses section of the site. The reason for making it into a map was the large number of courses. The design of the contact page in the last part of the site's main page was slightly different. The photo is placed against the background of this page and all conditions for communication with the school administration are created. One of the distinctive features of the site is the night mode. The reason for enabling this mode was to bring in the site's fashion. The switch to this mode button is located on the homepage. Site background was mostly white and the fonts were black. When you turn on the night mode, they change, which means that the background turns black and the fonts turn white. Other pages of the site continue this design. The designer tried to make the site as bright and understandable as possible.

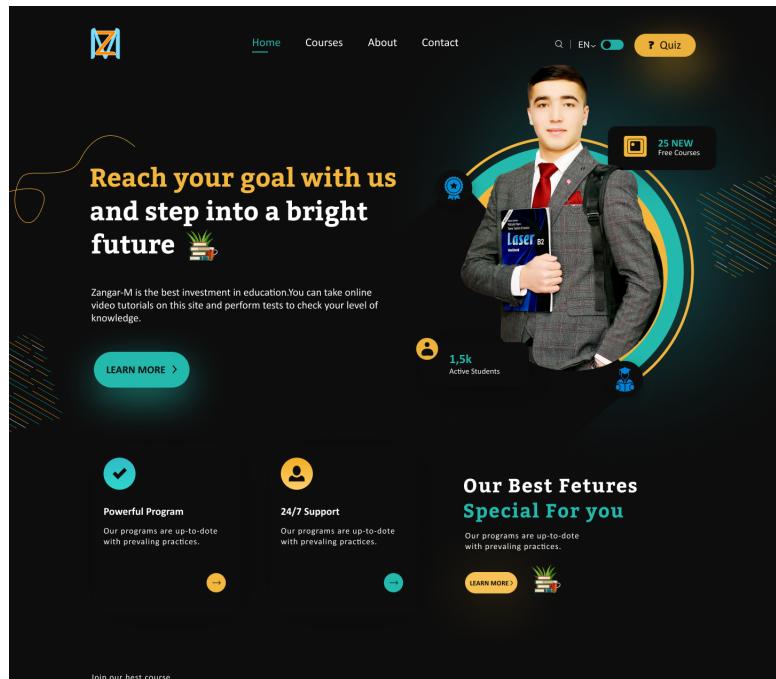


Figure 3.8: Dark mode of the site

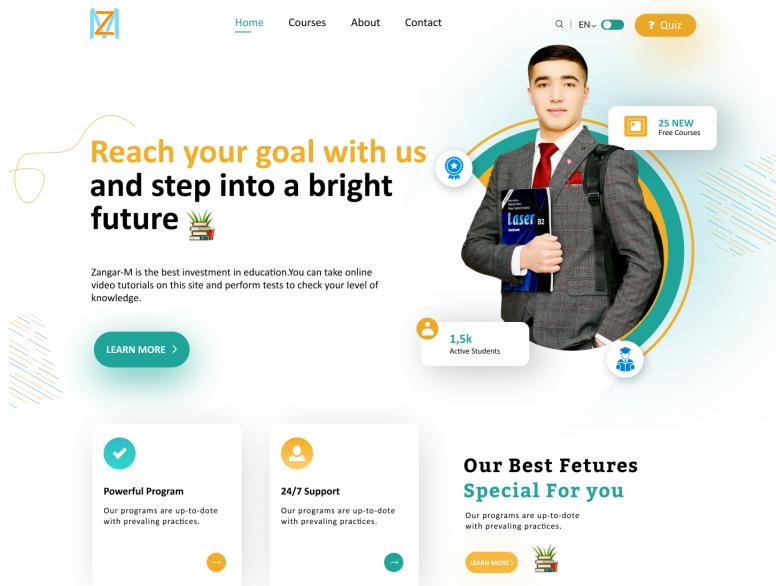


Figure 3.9: Light mode of the site

## 3.5 Frontend

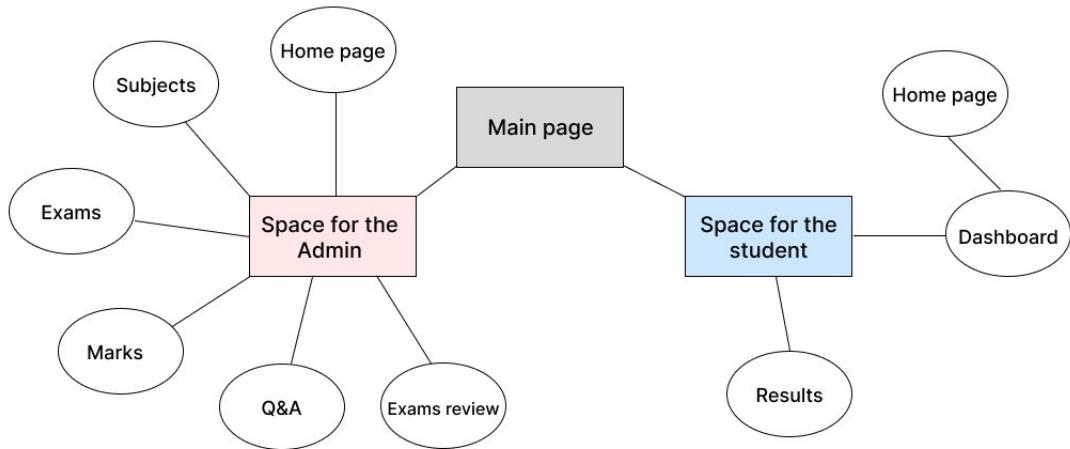


Figure 3.10: Diagram for a website

We faced some challenges when we started the frontend part of the project. Basically, the team had three options:

- Creating admin and student side of the platform using ready-made libraries.
- Write all the code from 0
- Write the most complex program using Java EE
- 

The first option was the most convenient and very simple. This simplified our workflow and did not require additional time. But the disadvantage of this is that it is difficult to bring it to the site drawn by the designer. It required a lot of effort.

In the second option, we write the project as we want. But the biggest problem that arises because of this is time. Writing a project using Java EE is very convenient and efficient. However, there are some drawbacks to this approach. The biggest problem is that, in order to write the back-end of the website, one needs to use the same language for the front-end. This can make it difficult for someone who has only worked with the markup language to navigate the project. Our team made a decision based on several online discussions and we chose the first path. We decided to use only Bootstrap and Laravel in our front-end library. We will describe the work process in Laravel in the section below. As for the language of our website, we have chosen a classic approach, which means we use HTML and CSS to solve them. Using these methodologies, we have created a platform that will satisfy the client's brief.'

Advantages of the platform: Simple - any ordinary user can use this site. Another reason it was simple was that our client was a high school in a rural area,

so the site didn't have a lot of features added to it. Presenting a dynamic and complex functional site to a school that is now developing in terms of technology would have been painful for both parties.

### 3.5.1 Architecture

1. Space for the student
2. Space for admin
1. Functions that should be include in the space for students: Home Page - The main mission of this page is to get more information about the school Dashboard is a page where you can see the assignments given by the teacher and complete them Results - through this page, students can find out if they passed or failed the exam
2. Functions that should be include in the space for admin

Home Page - The main mission of this page is to get more information about the school Subjects - allows you to add subjects that are not available in the portal for teachers Exams - here you can create a test for each lesson, set a date and set a timer for it. Marks - Set pass marks for students. Choose the test you need, how many points you need to give to the questions, and how many points you get to successfully pass the test. Q and A - In this section, teachers will create questions. And it comes out with variations. Students are one of the most important aspects of the site. Teachers can give students access to the platform. Exams review - information about how students passed the test. If the test is successfully passed, it is possible to send a message to the mail.

#### Notification:

As we mentioned in the last section of Architecture, if the student successfully passes the test, the teacher can send him a message about it. To do this, we used the mailtrap service. When we talk about Review Exams, students' grades come out. If he has passed the test, the teacher can send a happy message to the student by clicking the Approved button.

## 3.6 BackEnd

Framework When writing the backend of our project, we chose laravel v9.52.4 and Php v8.0.25 the JS framework. This was chosen because it is the best tool for our project. We also used several third-party libraries, such as Ajax.

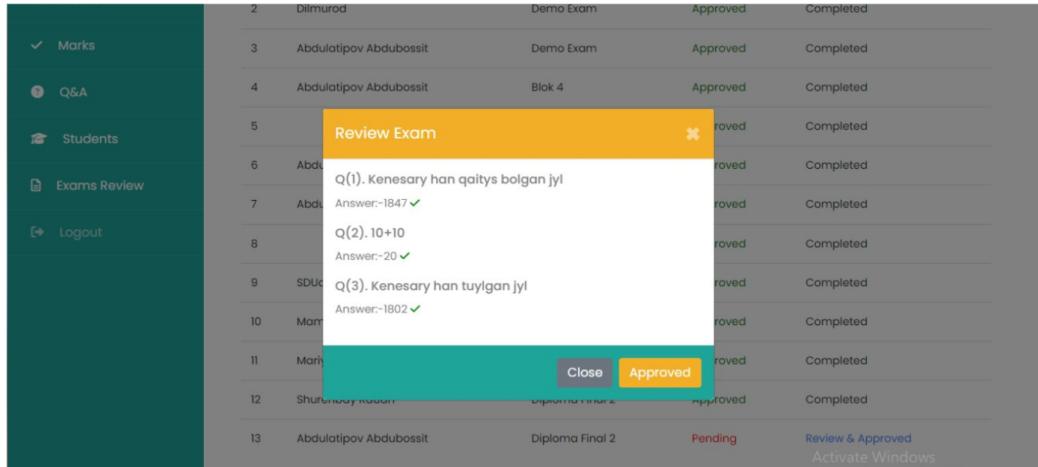


Figure 3.11: View of the "Review Exam" page on the website

PHP is one of the most popular programming languages for developing websites and web applications. Based on PHP, several frameworks have been created that greatly simplify the tasks of developers. If you're a PHP programmer, chances are you've already come across Laravel as it's one of the most powerful PHP frameworks out there today.

Laravel is a popular platform for rapid development of web services, as it provides high security for the applications you create. The need for rapid development is increasing, and for this reason, today more than 70,000 web applications are based on Laravel.

The screenshot shows a code editor with an open file named AdminController.php. The code is part of a Laravel application, specifically the AdminController. It contains methods for managing exams, including adding a new exam and getting exam details by ID. The code uses PHP and includes database queries for inserting exam data into a database table.

```

EXPLORER
ZANGAR QUIZ
> idea
> app
> Console
> Exceptions
> Http
> Controllers
  AdminController.php
  AuthController.php
  Controller.php
  ExamController.php
  TeacherController.php
> Middleware
  Kernel.php
> Imports
> Models
> Providers
> bootstrap
> config
> database
> lang
> node_modules
> OUTLINE
app > Http > Controllers > AdminController.php > AdminController
67 // Exam methods
68
69 > public function examDashboard() { ... }
70
71
72
73
74
75
76 try {
77     $unique_id = uniqid('exid');
78     Exam::insert([
79         'exam_name' => $request->exam_name,
80         'subject_id' => $request->subject_id,
81         'date' => $request->date,
82         'time' => $request->time,
83         'attempt' => $request->attempt,
84         'entrance_id' => $unique_id
85     ]);
86     return response()->json(['success'=>true, 'msg'=>'Exam added successfully!']);
87
88 } catch(\Exception $e) {
89     return response()->json(['success'=>false, 'msg'=>$e->getMessage()]);
90 }
91
92
93 > public function getExamDetail($id) { ... }
94
95
96
97
98
99
100
101

```

Figure 3.12: Controller code for creating a exams

Ajax is a technology that allows you to access the server without reloading the page. Usually used to dynamically load page content, for example, in online stores or marketplaces. With its help, it becomes more convenient to use the resource, the speed of interaction increases. The abbreviation stands for Asynchronous JavaScript and XML, from the name it is obvious that JS is required for the technology to work

```

EXPLORER          ...  exam-dashboard.blade.php ...
resources > views > admin > exam-dashboard.blade.php > script > searchTable
439   });
440   </script>
441
442   <script>
443     function searchTable() {
444       var input, filter, table, tr, td, i, txtValue;
445       input = document.getElementById('search');
446       filter = input.value.toUpperCase();
447       table = document.getElementById('questionsTable');
448       tr = table.getElementsByTagName('tr');
449       for (let i = 0; i < tr.length; i++) {
450         td = tr[i].getElementsByTagName('td')[1];
451         if (td) {
452           txtValue = td.textContent || td.innerText;
453           if (txtValue.toUpperCase().indexOf(filter) > -1) {
454             tr[i].style.display = "";
455           } else {
456             tr[i].style.display = "none";
457           }
458         }
459       }
460     }
461   </script>

```

Figure 3.13: Javascript (ajax) code used to compile exams

Load reduction. Due to the fact that the user does not refresh the page, the load on the site is seriously reduced. Sometimes a person can perform a whole range of actions, and this does not require a reboot: the server is accessed only for specific data, and not for a huge amount of information at once.

Visual Studio Code is a text editor developed by Microsoft . Code editor for cross-platform web application development. Includes a debugger, Git tools, syntax highlighting, IntelliSense, and refactoring tools. It has ample opportunities for customization: custom themes, keyboard shortcuts and configuration files. We only worked with this editor

**DataBase** In Laravel, it is extremely easy to interact with the database on various "engines", whether it is raw SQL, a flexible query builder, or Eloquent ORM. Laravel currently supports four database systems:

MySQL postgres SQLite SQL Server

We chose MySQL. MySQL is the solution for small and medium applications. For web applications, speed is important. The user will not wait for the page to load - he will simply leave it if the application does not work fast enough. Included in WAMP, AppServ, LAMP servers and in portable assemblies of Denver, XAMPP servers.

## 3.7 Product test and its results

After the school site was completely created, we conducted a usability test. The purpose of the usability testing was to see how the site would affect users and to check if there is a need to fix any inconveniences that we might have encountered prior to the site's launch.

**Methodology:** The participants visited the school for the process, the testing process was conducted through a browser, and information such as satisfaction ratings and suggestions for improvement was collected. The total number of participants was 25 people.

The participants were divided into three groups:

1. 11th grade students (10 users)

2. School teachers (5 users)
3. Regular users (10 users)

### 3.7.1 Plan

- Gathering participants in groups at a certain time for presenting.
- Presenting an explanation of how the site works.
- Assigning email addresses and passwords to teachers and students.
- Providing each participant with an evaluation sheet.
- Conducting interviews with participants after the process.
- Discussing and correcting errors based on the survey results

Procedure:

Users were given 30 minutes to fully test the site. After the participants were given a start, they were allowed to go to any page of the site and try any test. If the user is a student, they can log in with a login password and take tests and view courses. Ordinary users can view any page, get information and send a letter to the school administration. And if the user is a teacher, he can create courses and quizzes.

Assessment method

After users completed testing the site, they were given an evaluation sheet. The purpose of this test is briefly written on this page. After users enter their information there, they evaluate the following necessary evaluation functions:

- Functionality Testing: Testing all website features to ensure they are working properly. This includes checking links, forms, buttons, and other interactive elements.
- Content Testing: Ensuring that all website content is accurate, up-to-date and error-free.
- Design review: Pay attention to the correct shape and color combination of all elements on the site.
- Convenience check: Pay attention to how comfortable you are when using the site and performing the functions.

The minimum test score is 0 (zero), the highest score is 10 (ten) points. Participants showed the following results with this assessment method.

**“Zangar – M” платформасына сыйнак жүргізу**

“Zangar – M” платформасыны іске косу алдындағы сыйнектан өткізу процесі

Сайтты толькта тексеріп болған соң осы бағалау парагына темендең көрсетілген функцияларды бағалап кетүнгізді сұраймыз. Алдымен өзіңіз туралы сұраптарға жауап беріп кетсөніз:

Аты жөніңіз:	
Статусыңыз (студент, үстаз, қарапайым колдануушы)	
Жасыңыз:	
Сыйнак жүргізген уактыңыз	

Бағалау 1 мен 10 бал аралығында болады.

Тексеруге тиіс функциялар	Функцияның мазмұны	Бағалау (1-10) балл
Функционалдылықты тексеру	Веб-сайттың барлық мүмкіндіктерін тексеріп, олардың дұрыс жұмыс істейтінніне көз жеткізу. Бұған сілтемелерді, пішіндерді, түймelerді және басқа интерактивті элементтерді тексеру кіреді.	
Мазмұнды тестілеу	Веб-сайттың барлық мазмұнның дәл, жаңартылған және катесіз екенине көз жеткізу.	
Дизайндық тексеру	Сайттагы барлық элементтердің дұрыс пішінде болуы және түтерінің үйлесіміне мән беру.	
Қолайлылық тексеру	сайтты колдану бағызында және функцияларды орындау бағызында каншалақтық сізге ынгайлы болды соган мән берініз.	

Веб сайт жайлы өз пікіріңіз:

**Коніл боліп келгенініңге ракмет!**

Figure 3.14: Testing sheet rated by users

## Result

After testing all three groups, we got the following results:

- Functionality Testing - 7,8 points
- Content Testing - 9.1 points
- Design review 7.2 points
- Convenience check - 8.3 points

According to the results of this survey, on average, “Design review” showed the lowest result (7.2 points). The best result of this test was the Content Testing (9.1 points).

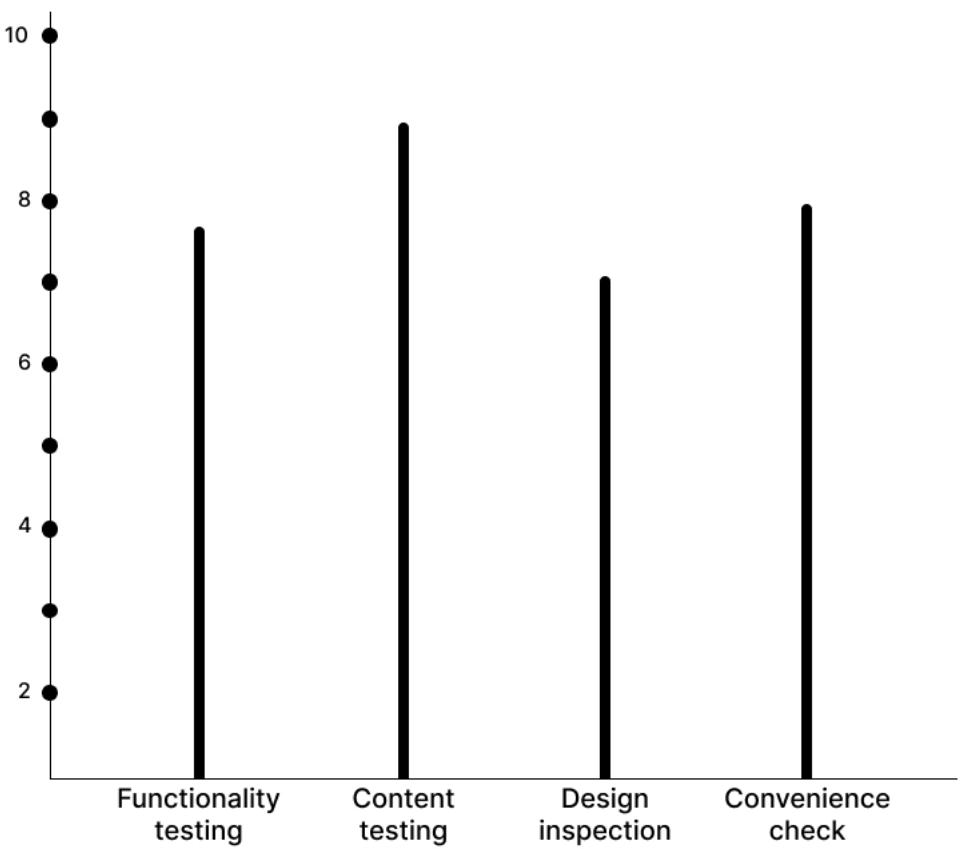


Figure 3.15: Product test results

Despite the fact that the test's results were above average, there were individuals who could not use the site correctly. In addition to that, some of the users also faced challenges with the design structure in terms of inconveniences in the navigation system. The results of this testing helped to fix problems associated with the user experience of the platform.

# Chapter 4

# Conclusion

## 4.1 Result

Overall, our idea is to make education more accessible and effective, serving as a useful tool for both teachers and students. As a result, we have a working and active educational site. Everything that needed to be done has been done. And after the completion of the contract, we have plans for the further development of our project. In the meantime, we will maintain the site and, if necessary, fix problems that arise.

Features to be enabled for students: Home page - more information about the school, dashboard - see the tasks given by the teacher, results - Exam Features that should have been in the admin panel: homepage ,items,exams,ratings,Questions and answers, and so on.

In conclusion, it is possible that the work done during the semester was ideal. New technologies have been applied and we have found ways to solve various problems. There were also times when we had a lot of mistakes, but this gives us more passion for this project.

## 4.2 Future development of the project

To conclude we want to state that we have high expectations for the project's future because the base that we are building now will be integrated into the school's curriculum and expanded in the coming years. Currently, we are in the process of the discussions on how to integrate the final version of our platform into the system of the school. The next step in the expanding of the platform is to add the "recording cameras" base to the Zangar-M platform. This camera will activate when students start their exams and record all sounds and movements. The teacher can then review the footage after the exam. If the student violates the exam rules, the camera control will alert both the teacher and student. Repeat offenses will result in expulsion from the exam. While similar platforms exist today, our version will be different because it will allow students to re-enter the

exam with the teacher's permission, rather than requiring additional proctoring set-up.

Another feature that we are planning to add to the platform is attendance tracking. Currently, there are cases of students missing school and engaging in other activities. To address this issue, we will add an attendance function to the site. Teachers can mark absent students, triggering an email to the parents. At the end of the semester, the platform will provide statistical information on how often the student missed class. The goal of this function is to ensure students' safety and make the learning more comfortable. As times change, we expect more students to transition to online or blended learning formats. Despite this, there will still be students who prefer offline learning. Our aim is to provide a platform that can accommodate all students' needs and promote a fair and effective education system in the chosen region.

# Appendix A

```
function searchTable() {
    var input, filter, table, tr, td, i, txtvalue;
    input = document.getElementById('search');
    filter = input.value.toUpperCase();
    table = document.getElementById('questionsTable');
    tr = table.getElementsByTagName('tr');
    for (let i = 0; i < tr.length; i++) {
        td = tr[i].getElementsByTagName('td')[1];
        if (td) {
            txtvalue = td.textContent || td.innerText;
            if (txtvalue.toUpperCase().indexOf(filter) > -1) {
                tr[i].style.display = "";
            } else {
                tr[i].style.display = "none";
            }
        }
    }
}
```

Figure A.1: This is a JavaScript function. The purpose of this code is to select questions

```
<div class="modal fade" id="addExamModel" tabindex="-1" role="dialog"
     aria-labelledby="exampleModalCenterTitle" aria-hidden="true">
<div class="modal-dialog modal-dialog-centered" role="document">
    <div class="modal-content">
        <div class="modal-header">
            <h5 class="modal-title" id="addExamTitle">Add Exam</h5>
            <button type="button" class="close" data-dismiss="modal" aria-label="Close">
                <span aria-hidden="true">&times;</span>
            </button>
        </div>
        <form id="addExam">
            @csrf
            <div class="modal-body">
                <label>Exam Name</label>
                <input type="text" name="exam_name" class="w-100 mb-3" required
placeholder="Enter Exam Name">
                <br>
                <label>Subject</label>
                <select name="subject_id" class="w-100 mb-3" required>
                    <option value="">Select Subject</option>
                    @if(count($subjects) > 0)
```

Figure A.2: This is the code to open the "Add Exam" page

```

        @foreach ($Subjects as $subject)
            <option class="w-100" value="{{ $subject->id }}>{{ $subject->subject
} }</option>
        @endforeach
        @else
            @endif
        </select>
        <br>
        <label>Date</label>
        <input type="date" name="date" class="w-100 mb-3" required min="@php echo
date('Y-m-d'); @endphp">
        <br>
        <label>Time</label>
        <input type="time" name="time" class="w-100 mb-3" required>
        <br>
        <label>Attempt</label>
        <input type="number" name="attempt" class="w-100 mb-3" min="1"
placeholder="Enter Exam Attempt Time" required>
    </div>
    <div class="modal-footer">
        <button type="button" class="btn btn-secondary"
data-dismiss="modal">Close</button>
        <button type="submit" class="btn btn-primary">Add</button>
    </div>
</form>
</div>
</div>

```

Figure A.3: This is the code to open the "Add Course" page

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