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Application for learning the Kazakh language

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Abstract

Work was carried out to create a site for learning the Kazakh language at any age, in particular for beginners in mastering the basics, and to reinforce knowledge for advanced users.

The topic of this work was chosen in connection with the current problem of the lack of an application for high-quality learning of the Kazakh language and for its popularization not only in the country but also outside. Since learning Kazakh for English-speaking people will also be taken into account.

The thesis project was developed using website creation tools such as HTML, CSS, PHP, Firebase, JavaScript and also Figma to create the visual design itself.

As a result of all this, a website was created through which people who want to learn the Kazakh language and those who want to improve it can freely study it in a fast and interactive manner, as well as get an unforgettable experience and a function that allows the user to get motivated, which will contribute to full involvement in the learning process. The creation and study of various factors of the website will be useful for both children who want to learn their native language, and adults who want to improve their knowledge. In addition, the user can track their own results and see progress, and at any time can change their level on the site from beginner to advanced or expert.

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1. Introduction

Nowadays it is impossible to imagine a way of life without information technologies, which are widely used in various fields of activity. They have become an integral part of our daily routine, simplifying many tasks and saving time.

At the moment, Information Technology (IT) is not just some games, applications or sites, it is something more like machine learning that uses the same Google to select from a million the very request that you need or chats that help us people in almost everything. All this now contributes to the fact that people are informationally developed, since, willingly or unwillingly, we are all part of the information field. Social networks, browsers, dating sites - all this came thanks to the development of technology and the advent of the Internet. "We are increasingly engaged in electronic communication with people who are physically far away from us. Sometimes, we are on the opposite sides of the world. Digital technology makes the world smaller and makes people more convenient..." (Brad & Brown, 2021).

Various sites are like a library with a bunch of books, and if we talk about education, then educational sites and applications are classified as this virtual "library". One of the most successful of these sites is Duolingo (a platform for learning languages) (Louis von Ahn & Severin Hacker, 2011), where people can learn various languages without leaving home and even if they don't have more than 5 minutes to study. This application has become an impetus for those who have no time at all or those who are embarrassed to work and live with a teacher or group. Everything is very easy on the site, you go in, take the test, find out your level, choose a convenient schedule and learn the language. There is also a rating that gives motivation to reach 1st place and be the best. Describing these functions, I would like to point out that in Duolingo there is no study of the Kazakh language (especially for English-speaking people), based on this, exchange students would be interested in such a site.

Exchange students who studied at Maqsut Narikbayev University (MNU), many of them showed love for the culture of Kazakhstan. Watching various events and activities dedicated to national holidays, as well as tasting national dishes and immersing yourself in culture. This observation showed that many exchange

students are interested in the culture of Kazakhstan. Such people responded positively and would like a website to be created where it would be easier for them to learn the language from English to Kazakh and vice versa. Actually, this is the key idea of popularizing the Kazakh language among exchange students and simplifying learning for people who also want to learn the Kazakh language outside the country.

Creating a website is quite a creative process; it all depends on the vision. This site will have three main pages (login page, registration page and menu page). The login page is standard, that is, there is a login field and a password field. The registration page also has two fields, filling in your email (for login) and creating a password. The most difficult thing is the menu page, since there are several functions here: user profile, your personal rating, tasks and the main page itself. At the beginning there is a test to test the user's knowledge; the test itself involves three stages. The first stage is words, the correct choice of words. These functions turned out to be quite convenient because in the future, in order to identify what should be added or, conversely, removed, a survey was conducted where people themselves will be able to determine what the final product should be.

The quantitative method itself will also be used to conduct a survey among English-speaking teachers and exchange students, as well as an additional literature review for the accuracy of the research.

2. Literature Review

Nowadays, where technologies are developing and comfortable living conditions are being created, our country has a problem in learning the Kazakh language and popularization among foreign tourists. As noted by Ex-Minister of Education, deputy of the Mazhilis (Satbayeva, 2023), infrastructure is needed, and one should not even expect that only the government will do this, it is important that now the people are trying and volunteer organizations and initiatives are being created. The government noted that it planned to increase the percentage of Kazakh language proficiency to 95% by 2020 (Isabaeva, 2019). Therefore, it can be analyzed that by 2020, 90.5% of the population of the Republic of Kazakhstan used the Kazakh language, and by 2022 this figure had decreased to 80.1% (Vlast.kz, 2022), which leads to a great degree of indecision in improving the level and quality of development of the Kazakh language among the population of the Republic of Kazakhstan and abroad. Also, according to data for 2023, social studies on knowledge of the Kazakh language among the population were conducted in the Republic of Kazakhstan, where the result showed that 95% of the population knows and uses the Kazakh language (Urankayeva,2023). The government was able to achieve the desired result within 3 years, but in what ways, it is not advertised. Currently, there are many ways to develop the Kazakh language, such as online and offline courses, applications and games, but all have success and help in real life.

There are numerous efforts to popularize the Kazakh language, especially in social media. For example, kazakh_speaking_club (kazakh_speaking_club, n.d.) on Instagram, where various meetings are held to practice the spoken part of the Kazakh language, both children and adults gather. Most of the free courses for learning Kazakh on Instagram are also available in the public domain. For example, soyle.kz (Soyle.kz, n.d.) which has an extensive audience and allows corporate training for beginners. Consequently, most residents of the country offer their help for the development of the Kazakh language through social networks. But despite the efforts of volunteers, there is not enough support from the government, as noted by deputy of the Mazhilis Kazbek Isa of the Ak Zhol party, government members did not support the deputies' proposals to consider laws on the state language (Urankayeva, 2023). In

general, there are not enough sites and applications for learning the Kazakh language, especially from English, and this makes our project unique. Due to the problem of the lack of available courses or convenient websites for native English speakers, in this regard, this website is being developed to popularize the Kazakh language among residents of our country and other countries who will have basic knowledge of the Kazakh language. One of the main factors in the creation of such a website is the release of the Oxford Dictionary of the Kazakh language in 2023 (Kemelova, 2023), which is bidirectional, this is one of the confirming levels of development and popularization of the language outside the country. Consequently, many foreign tourists interested in the Kazakh language now have the slightest opportunity to learn and understand the Kazakh language. The website being developed is more focused on foreigners who have the opportunity to gain knowledge of the Kazakh language from English.

Foreign students show great interest in the Kazakh language and traditions (Telekanal 24kz,2024). Despite the fact that the profession of most students is not related to the humanities, there is a breakthrough and a desire to study the Kazakh language. In the native country of foreign students, Kazakh education is considered one of the most prestigious, but upon arrival they can study Kazakh only in local libraries, which at first prevents them from adapting to a new language and communicating completely freely. It would be much more convenient to come to the country already trained in the language in order to feel free upon arrival in the country. In this regard, a survey was created, which students will also take to understand how they would like to learn the Kazakh language, and from which language it would be easier to receive information. The survey was also conducted among foreign students of MNU who came to our country under the exchange program, as there were individuals who showed their interest in the language and traditions of our country, and it was decided to get an opinion about the website about the analysis. Foreign citizens also include Kazakhs born or adopted outside the country (Dyusengulova, 2024).

A very striking phenomenon also occurred during the pandemic, Kazakhs living in the UK studied their native language, national traditions and culture through online courses (Jibek Joly TV, 2021) which were

organized by Otandastar foundation. According to one of the teachers of these courses, this course has interested people not only in England but also around the world. This project is close to what prompted the creation of a website for learning the Kazakh language, since the intended target audience is not only inside the country, but also outside. Age restrictions are also not about this site, as it will focus on making it easy for children to learn the basics, and for adults to improve the language and replenish their speech and vice versa.

In addition, one of the problems for foreigners in our country is that there are not enough English-speaking teachers in our educational training program. Since 2017, the government has started teacher training and certification programs in English, but despite the efforts, the training system was incomplete and out of 11,500 thousand applications submitted by teachers, only 3,000 thousand teachers were able to pass certification. Due to the new requirements, it was necessary to quickly master English, which, of course, was not so successful, since teachers were given too little time (Kazistayev, 2019). Ignorance of the English language on the part of teachers leads to the problem of creating resources when teaching Kazakh from English. Creating a competent website for teaching the Kazakh language can help to cope with the lack of resources for learning.

Currently, news is being published, where cases are widespread where a person belonging to one ethnic group was born or moved to another country from an early age and does not know his native language at all (Dyusengulova, 2024), and such sites will facilitate easy learning. (Higgins & Stocker, 2011) draw attention to the problem of Koreans returning to their country after living in the United States. A big problem is the lack of knowledge of the country's language, as well as adaptation to life in a new society. For example, citizens who return to South Korea after living in other countries cannot fully integrate into society even after learning Korean as an additional language, but, nevertheless, they can live peacefully in their native country, feeling at the same time a full-fledged belonging. There is no age limit, they can be adopted at an early age, and will return by the age of 19, also at 55 or more, which means the importance of courses for all age categories.

Since there are no age restrictions on the developed website, it was decided to create small creative moments, like in games, so that it would be interesting to take tests not only for adults, but also for children, because it is difficult to focus on the learning process without using some kind of creative approach. A study (Rachels & Rockinson, 2018) showed that there is no significant difference in the effectiveness of language learning between students using gamified language learning applications and students learning using the traditional method. Accordingly, learning a language through gamification is a good learning tool, where it can also be used to motivate users to take big steps.

A review of the literature shows that by implementing a motivation system, as well as tracking results and progress, it helps people a lot, because everyone has a small level of competition, which leads to the fact that, knowing and seeing the results, a person understands what achievements and knowledge have been acquired, and how it works. in which direction they should aim. Following this judgment, according to (Tao and Zou, 2023), students believe that an application with a gamification and a competitive approach increases their motivation. So, the rating method will increase productivity and the desire of users for knowledge, since most often the competitive process inspires people. When creating the website, it was decided not to complicate the site too much and not to introduce unnecessary modes, because we need to focus on something interesting, new or intriguing, which will contribute to a good assimilation of knowledge.

Concluding the literary review, the best interface is a simple and fast interface with minimal functionality, as well as simple icons and a minimum of text. Everything is short, fast and clear, this is exactly what will be on the website being developed. The design of the website was inspired by the Duolingo (Duolingo, n.d.) application, which is number 2 in Kazakhstan among the most popular applications in the App Store (marketplace developed by Apple). Therefore, the rating of the application and reviews show the convenience and clarity of use. After all, if the user is a very busy person, then it is enough to describe this in the initial test and there will be a detailed five-minute training for each day, where during the day the user will be able to safely log in, take tests and gain knowledge, despite the continuous

schedule. In addition, the application has a motivation system that has a positive effect on the intellectual level of the user, because in this way he feels that even minor language lessons give promotion. Based on the above, the idea was adopted to create a user-friendly website for learning the Kazakh language from English. After all, even a small amount of time devoted to studying brings a huge cumulative benefit to a person.

3. Methodology

In order to conduct a more thorough analysis of this project's topic's significance, a quantitative methodological approach was used during the process of this project. This helped us find the real reasons why learning the Kazakh language is problematic for foreign people and Kazakhs who grew up in other countries.

To gain a more comprehensive understanding of the circumstances and the project's analysis, an online survey was conducted using Google Forms. The survey was approved by the Maqsut Narikbayev University Science and Ethics Committee.

The survey contains 8 questions that will help determine the level of Kazakh language proficiency among the survey participants, whether they want to learn this language, and if the answer is yes, how they would like to learn the language. 4 main questions were used to analyze the information, these are:

- How old are you?
- Rate your knowledge of the Kazakh language.
- What applications/sites do you know for learning the Kazakh language?
- Which language would you like to learn Kazakh from?

These questions were created in order to understand the ways in which people want to learn a language. The survey was sent using the WhatsApp application to university chats, where there are especially many nonresident students and teachers, and information from it was presented in the form of pie charts. This information helped to understand the need for a site for learning the Kazakh language, as well as to understand how the site was supposed to work.

Thus, the significance of the problem was assessed using data from an online survey conducted among university students, mostly non-residents. Therefore, the significance of the problem was assessed utilizing data from an online survey conducted among university students, primarily non-residents.

Here is a timeline of 5 steps by which the website was created.

1. Understanding. Several articles and videos on the language problem in Kazakhstan led to the search for a solution to this problem.

2. Brainstorming. After several discussions to solve this problem, the decision was made to create a website.

3. Design creation. Creating a design made it clear what the website will look like and what functions should be created in the website.

4. Website creation. According to the prepared design, a website was created, including all pre-thought-out functions.

5. Website improvement. After testing the product with several people, the website continued to improve, correcting previous errors
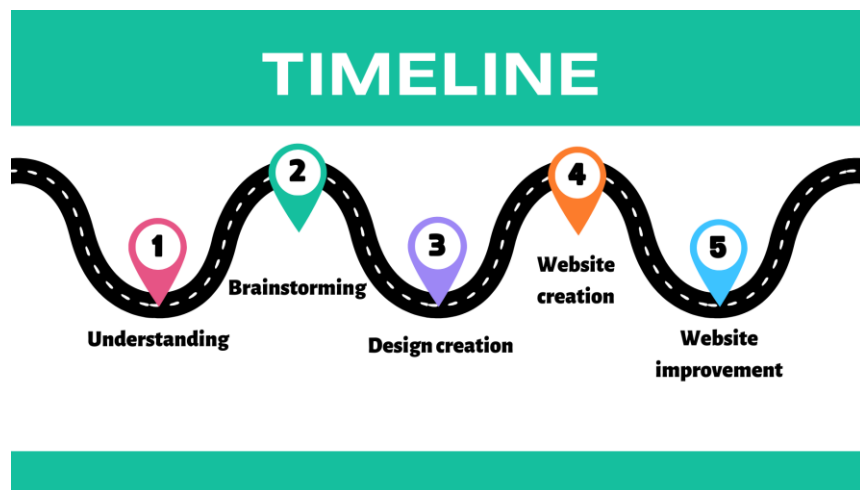

Figure 1. Road map of development process

4. Analysis and Results

4.1. Description of the IT product developed

The IT product, in the form of an educational website, was created to popularize the Kazakh language among the population not only in the country but also abroad. The project includes motivational functions, in the form of achievements among users, test questions, tracking the results of passing levels, transitions to higher levels, basic and necessary elements of the Kazakh language. The main goal is to popularize the Kazakh language, but also to provide accessible and interesting training in the form of a website. The development of this website will improve the quality of the Kazakh language, help to gain basic knowledge, save users' time, and provide opportunities to show the beauty of the language.

The project is a website with basic functions like data collection, updated lessons, basic training programs, passing levels, etc. An intuitive interface leads to an increase in users, due to the complexity of the site. There is also a user account function, which provides information about past lessons and future ones.

This entire base of functions was based on the Oxford Qazaq Dictionary (Oxford University Press) since it contains translations of words from Kazakh to English, and vice versa. The base of this dictionary consists of 60,000 words and phrases (collocations are found there). Also, when a word is mentioned in the singular, you can also see the plural or inflection of this word, which immediately gives specifics for one meaning. We also took prepositions from the dictionary based on other forms of words (plural). This dictionary is now the only one of its kind and was created on behalf of President Kassym-Jomart Tokayev (Vecher.kz, 2024).

The site also has icons (animals, drinks and others) that were used in the test as well as on the main page. These icons were taken from the Flaticon (Flaticon, n.d.) website, there are both paid and free icons for use. For each icon, the rule of indicating the author was used, since these are all copyrights, and even on the website, when downloading, a link is immediately given on how to indicate the author so that there is no theft of intellectual property.

4.2. User requirements and feedback

Analyzing the results of all the listed sources, it was decided to create a website for learning the Kazakh language. A survey was conducted, where 72% of survey participants aged 18-26 and 28% of participants aged 27-45 (Fig. 2), whose answers helped to understand exactly how a website should be made for learning the Kazakh language.
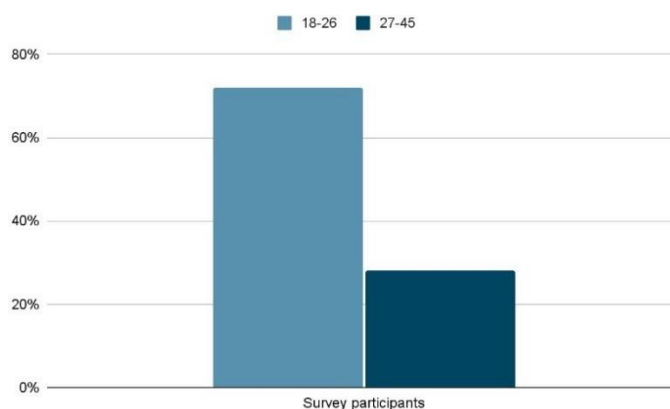

Figure 2. Age of survey participants

To begin with, it was necessary to determine what level of language the main audience of the website would have in order to understand who exactly we should focus on (Fig. 3), having understood that the main audience of potential users of the site are people at the beginner level, we decided to place great emphasis on creating content for this level.
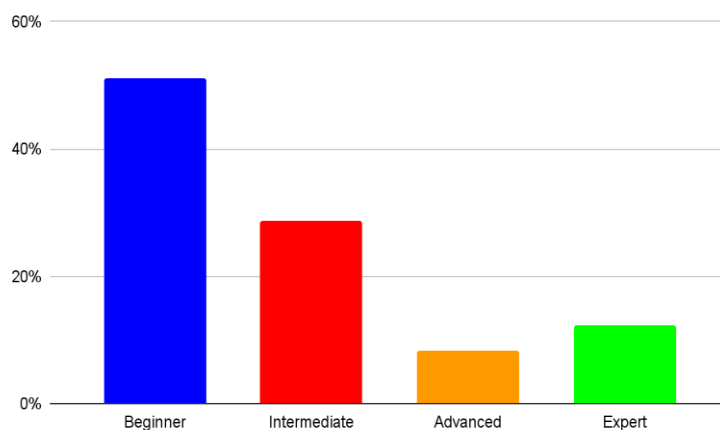

Figure 3. Level of language of survey participants

A question was created for the concept of what language learning resources potential website users know about, namely what websites they know about. According to the results of the survey, it was revealed that almost no one knows about any websites for learning the Kazakh language (Fig. 4), so there was a clear understanding that the need for a website for learning the Kazakh language as a resource for learning is extremely necessary.
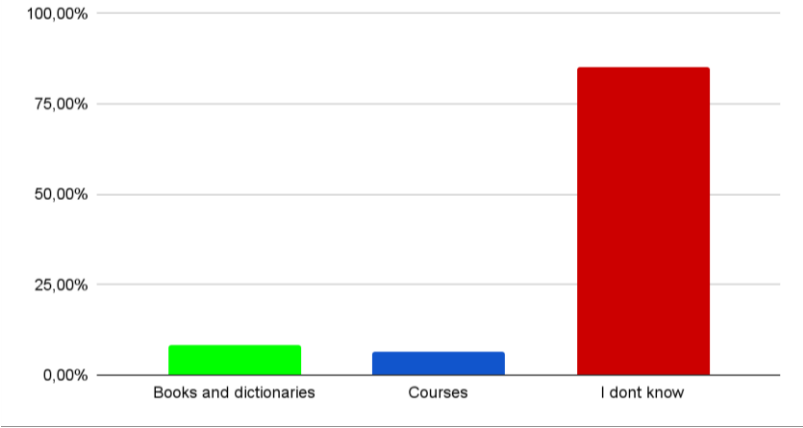

Figure 4. Knowledges of applications for learning kazakh language of survey participants

There was a clear understanding that there are many sources for learning the Kazakh language from Russian, since this language, along with Kazakh, is officially used in government organizations in Kazakhstan. Therefore, it was necessary to understand what language the survey participants would like to learn from. It was revealed that 3 quarters of the survey participants would like to learn Kazakh from English (Fig. 5), so it was decided that the site would teach from English to Kazakh.
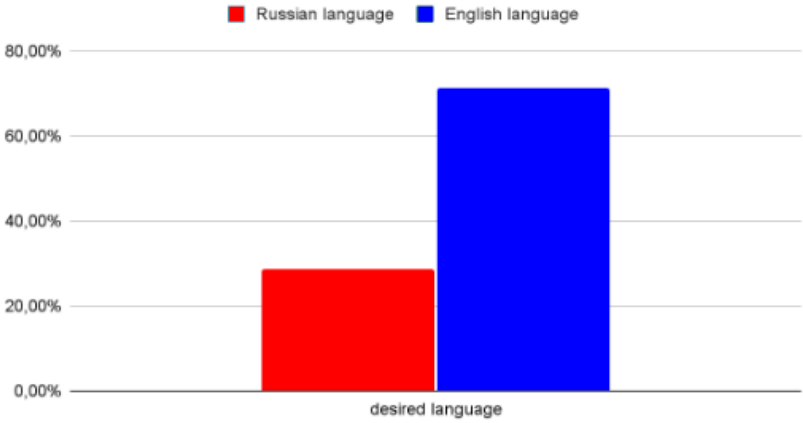

Figure 5. Desired language of survey participants

Before creating the site, it was necessary to register the system part of the project, so a diagram was drawn up, namely User Flow Diagram for Website, which will help us visualize what the website should look like. This diagram (Fig. 6) shows how the site will look from the user's side, what the order of pages will be, and what functions will be provided on any of the pages. Looking at the diagram, you can understand that the website will provide the user with functions such as start test, rating page, task page and so on.
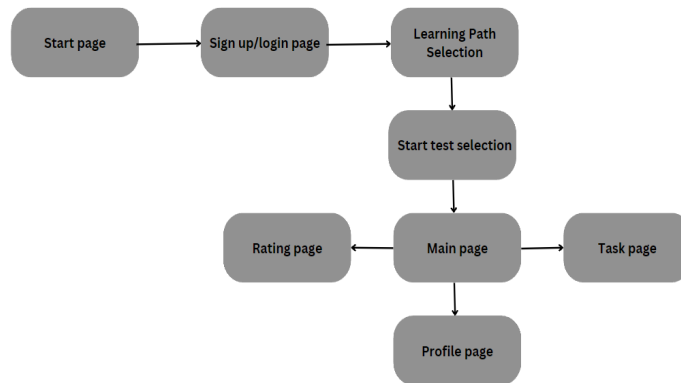

Figure 6. User Flow Diagram

4.3. Visual structure of the site and design development

Website development begins with planning and creating a design for a future website. The following topics are covered during the planning: introduction about the product, purpose and work plan. Therefore, after that, the site design itself is created, with the help of which the website will be encoded. During the planning and design, the Figma (Figma, n.d.) program was used, which makes it possible to calculate the location of objects, build a harmonious color palette, bring order to the pages and use a modular grid. The modular grid is a key point in the design, with which you can provide how objects will look and whether they will fit the size of any devices.

The visual structure of the site:

Main page:

   - Login button

   - Sign up button

- Call-to-action buttons: Login and Sign Up

Test page:

- Start with the basics Button

- Start without test Button

Test pages:

- Question Section:

  - Textual question

  - Icons for test answers

- Answer Section:

  - Feedback on selected answer

- Navigation:

  - Next Button to move to the next question

  - Error function for incorrect answers

Homepage:

- Subcategories section:

  - Education

  - Rating

  - Tasks

  - Profile

- Education subcategory:

  - Module 1 button with information

  - Module 2 button with information

Website design

Color palette: When choosing a color palette, the basics were taken from the website logo, the colors that

are available in the logo: purple, white, orange. Therefore, colors were used for the main background:

purple, white, due to the circular gradient. For the most part, the site has clear and identical colors to make it convenient and understandable for users when using this website.

Responsive Design: The website layout is responsive and optimized for a variety of devices, including computers, tablets and smartphones. One of the difficult stages of development was adding tests with audio. The audio itself was generated on a website where you can choose voice acting in the Kazakh language, which is exactly what was needed for the audio question base. 8 audio questions have been added, ranging from easy basic: Hello!, before proposals. 4 questions were made through the AI site. Also, on the Eagle website itself there is a speed adjustment, which simplifies the understanding of spoken language. This was the most important aspect of the site and the most difficult. After all, audio questions are already taken more seriously and provide greater progress in memorizing the language

Logo: The logo is one of the important points in the site, as it is imprinted in the memory and is further associated with the site. The original version was a full-length eagle with a twist in the form of a signature purple color. It was difficult to draw the logo, next, it was decided to use artificial intelligence resources - Microsoft AI. Not the first time, but we still managed to enter the request correctly so that exactly what we wanted would appear on the generated logo. The logo looks harmonious in the design; adjustments were made to it such as changing the size to a suitable one and also changing the format of the logo in PDF.

4.4. Development of technical elements of the site. Backend features

The technical elements of a website are key components in creating an IT product. Without technical aspects, the site will not function, but it will work, you will get an empty site with texts and photos, but using the backend, the site will function. Equally important and difficult is the creation of the backend of the product, where the codes and information for launching the website, itself will be written.

Server-side development is the logic of the site, which is hidden from users. The structure of the server part of the site for learning the Kazakh language includes collecting information about users, processing

response data on test pages, and interacting with other users using the rating page. For the server side of this project, scripts written in the code using JavaScript were used, as well as to run the database and save the Firebase (Firebase, n.d.) platform, which has a very simple but understandable logic. The simplicity of this platform is the NoSQL database, which is suitable for the development of scaled websites. The platform was used only for the registration and login part of the project. For success and clarity, the Authentication function was considered and selected, where you can monitor the process of saving the user database.

4.5. Optimization of business process

Concluding the analyses carried out during the development of this project, it was decided that using the website it is possible to expand the knowledge of the Kazakh language among foreign and indigenous citizens. Having an accessible, understandable and interesting product, it is possible to put forward the idea that the website will contribute to the growth of the country's economy. By providing an opportunity for citizens of foreign countries to learn the Kazakh language, it is possible to develop tourism, the country's economy, as well as show the beauty of culture and language.

For example, if we consider a similar platform that was given as an example, then this is Duolingo. Duolingo monetizes its app The Duolingo app has been downloaded more than 500 million times from Google Play and the App Store.

"In the first quarter of 2021, the company doubled revenue to $55.4 million. 72% of revenue came from subscriptions and 17% from advertising. For the second quarter, Duolingo's revenue was $58 million…" (Krasnikov, 2021). The first advantage of such a site is demand, since demand is growing every year, the second follows from the first, in fact, since there is a great demand for this, it can already be called the provision of services and they can be monetized - to issue a paid subscription for a large amount of knowledge and functions or to provide some privileges for a fee. In general, this example made it clear that the site can not only be published on the site, but also have some influence on it. It is still difficult to

say with certainty whether optimization for business will be considered as the ultimate goal, since this will require optimizing the database, as well as improving some aspects of the functions. But we can say with confidence that this is a great idea, because in the future it can be considered as a product that can be sold.

5. Discussions

Foreign students, beginners and Kazakhs born in other countries who want to learn the Kazakh language need a good tool to achieve their goal. The results showed that the majority of foreigners do not know the Kazakh language, while a large number of people in our country speak the Kazakh language, they are not only interested, they need knowledge of this language for a comfortable life, the results also showed that a large number of people who completed the survey, they don't know how to learn the Kazakh language, since there is no popular and good source that will bring results. A website for learning Kazakh from English helps solves these problems. The only problem is the lack of funds and sponsors to improve and support this website. Therefore, to achieve a better result, you need to attract the attention of potential sponsors to this project. This project can be sponsored not only by enterprises that liked the idea, but also by the state, since they often allocate funds to solve such problems. In the future, this project can solve not only the problem of foreign students, newcomers and Kazakhs born in other countries, but also over time become a single site in the country for learning the Kazakh language and other languages such as Spanish, Chinese and so on.

Also, in the development of the product, comparative analysis was used, comparing Kazakhstan's websites for language learning, measures were taken to include gamification and a competitive system, which makes the site original in this country.

During the development process, of course, there were various limitations. Initially, of course, a larger database was considered, consisting of about 1000 words and phrases and sentences coming from them, but due to the high load and lack of memory on the device and time, the volume had to be reduced. Based on the above point, it can be revealed that the product is not fully optimized, especially for peak loads. If we consider that this could not be achieved, then this was a correctly made profile page, since, again, the page could hang or give an error due to the script. In general, all other goals have been achieved: interface design, content and functionality of the site.

6. Conclusions

Summing up the results of the work done, it is first of all important to note the methodological approach, which helped to achieve the best result in the study. One of the key components was an online survey that helped identify problems in the country, namely the lack of resources for learning the Kazakh language from English. The main result of the work done was the need to create an additional tool, namely a website for learning the Kazakh language from English.

Thus, a website was created for learning the Kazakh language from English, which has several interesting functions that make the site interesting and enjoyable to use, namely test page, profile page, task page and rating page. These functions help to identify the level of language proficiency of the students, which will help build a learning plan for the student, after which he will be able to complete tasks in the task page section, while simultaneously competing with other website users, whom he will be able to observe in the ranking page. In addition, there will be admins who will have access to modify the website, which will help them add new tasks and words to the website, thus the website will become better and better.

The main and currently only identified problem of the website is the lack of funds and funding to support the website. It is precisely because of the lack of funding that the website cannot currently be improved, so further research is proposed that will help attract the attention of sponsors and the state. In addition to the benefits for foreign students and Kazakhs from other countries, the development of this product can bring great benefits in the field of education.

To summarize, a website has been created that helps solve the identified problem. The development and development of this website will help foreign students, newcomers and Kazakhs from other countries learn the language and feel free in Kazakhstan.

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Appendices

Questions for the survey:
1. How old are you?
2. Select your type of activity
3. Do you know the Kazakh language?
4. If you don't know the Kazakh language, would you like to learn it?
5. Rate your knowledge of the Kazakh language
6. Do you consider it important to know the Kazakh language?
7. What applications/sites do you know for learning the Kazakh language?
8. Which language would you like to learn Kazakh from?
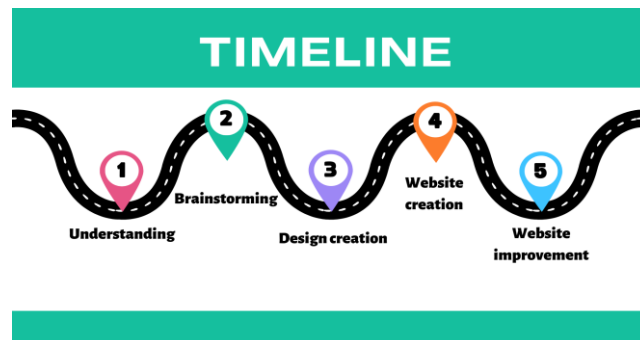
Figure 1. Road map of development process
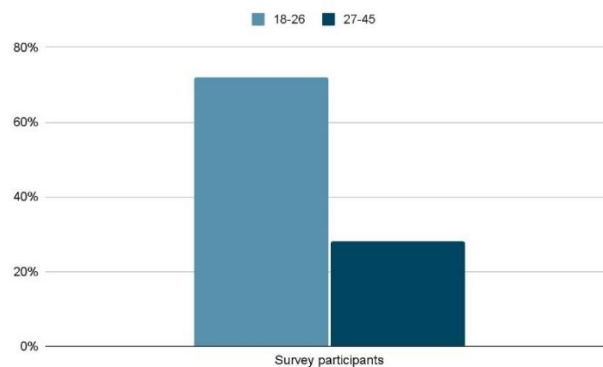
Figure 2. Age of survey participants
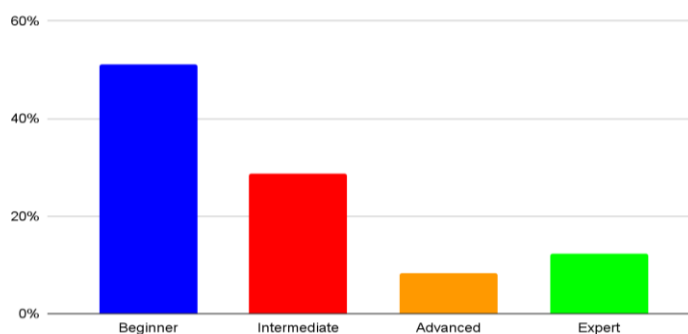
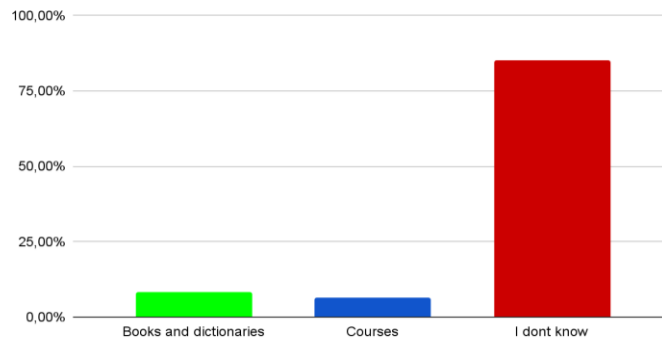Figure 3. Level of language of survey participants

Figure 4. Knowledges of applications for learning kazakh language of survey participants
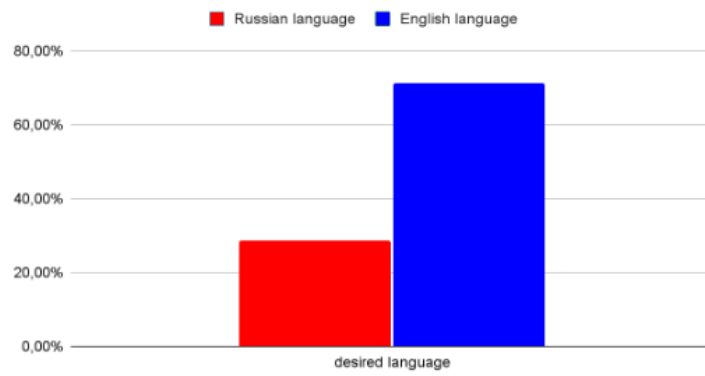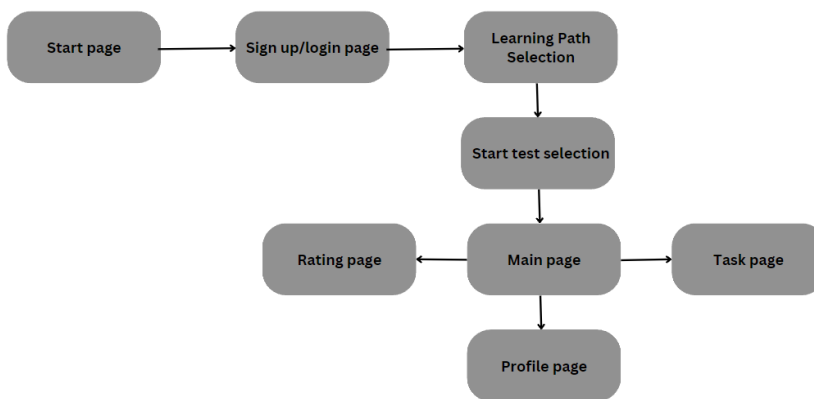

Figure 5. Desired language of survey participants

Figure 6. User Flow Diagram