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ChudoZnaiko: Platform for Educational Videos and Games for Children

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ABSTRACT

This article presents the innovative educational platform created for the parents of children from 3 to 7 years old. It consists of two parts - animations and video games. ChudoZnaiko is an applicable and new idea for our country for the process of home and informal learning.

Keywords: educational platform, animations, video games, hand - drawn, artificial intelligence.

INTRODUCTION

Modern technologies, fast-paced everyday life and the presence of children in the environment are factors providing an opportunity for development in the field of children's education.

The goal of the current work is to present the creation of a web and mobile platform that would make it easier for parents to explain the natural processes surrounding children. The creation process requires both technical and research related to children's perception. For these reasons, not only existing solutions were used, but also innovative ones. ChudoZnaiko provides parents with the opportunity to explain the processes around them to children with hand - drawn animations, as well as educational online games. Each image in the platform is hand - drawn or made using vector and raster graphics programs. For additional unanswered questions, an artificial intelligence model has been implemented, which is limited in its response by the authors of the project to provide safe content for users. It is obliged to answer in a childish tone, as well as not to touch on other topics than the one indicated, as well as not to answer inappropriate questions. To ensure user convenience and the effectiveness of the platform, the application uses modern web development technologies that allow for fast and secure work with databases, user interface and server logic, as well as a design specific to them and their attention.

EXPERIMENTAL

The selection of technological tools for

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the required development - easy to transfer information from a database to a website or mobile application was the first task of the work. Due to these circumstances, it was concluded that the framework Svelte [1] and the meta framework Svelte Kit would be used - a fast and modern JavaScript framework with built - in Typescript support, and for the database - PocketBase [2]. This option provides a database, file storage and administrator statistics. The website is hosted on Digital Ocean Hosting, provided by GitHub for students, as well as the domain [3].

The development process began with the selection of a target group (children from 3 to 7 years old) and the creation of a design that is suitable for use by parents, as well as interesting for children. An important part is that the colours are tailored to children with dyslexia, colour blindness, and the way the development works for the blind. This was achieved by achieving high contrast in colours, as well as easy navigation on the website using a keyboard [4]. Subsequently, the design of the website and mobile application was visualized in Figma and then implemented in both platforms [5]. The graphics and design materials that are so important for the project were created using Adobe's Creative Cloud programs [6]. The drawings were included for the creation of the animations, and the combination between them and the audio was done in Cap Cut / Adobe Animate [7].

Then we proceed to the functionality of the project, starting with the implementation of the landing page. It welcomes the user and when pressing the call to action button, the site takes them to a registration menu. Then the home page is visible, with three categories - animations, video games and one for the profile. There is a short description, an option to redirect to the main page for the category, and in "About the profile" the user's favourite content is visible. The ChudoBot artificial intelligence is implemented via the Gemini API [8].

The development of multi - platform projects currently provides developers with the opportunity to choose between multiple technological solutions. In this development, Svelte is preferred, as it is a modern framework for building web interfaces, which offers high performance. It is compiled into pure JavaScript during build, which makes it faster than React and Vue. In addition, Svelte has an intuitive and simple syntax, which greatly facilitates the work of developers.

In combination with Svelte, Svelte Kit is used, which is a full - stack framework. It provides convenient navigation and dynamic loading of pages, which contributes to a better user experience.

For the backend part of the project, PocketBase was chosen - a lightweight and open - source backend that offers authentication, a database, file storage and a real - time API in a single package. It is based on SQLite in WAL (Write Ahead Logging) mode, which makes it a suitable alternative to Firebase and SupaBase for small and medium - sized projects. PocketBase is also a free and affordable option for students.

For hosting, Digital Ocean Hosting was used, which offers reliability, flexibility and scalability. Thanks to the integration with GitHub, students can benefit from free access for a certain period.

For design and graphic elements, Figma and programs from Adobe Creative Cloud, including Adobe Photoshop, Adobe Illustrator and Adobe Animate, were used.

- Figma was preferred due to its ease of use and flexible collaboration capabilities.
- Photoshop was used to create and process raster images.
- Illustrator was used for vector graphics.
- Animate was used to create interactive animations.

The choice of Svelte, Svelte Kit, PocketBase and Digital Ocean Hosting was made with a view to high performance, ease of use and accessibility for students. In the graphic part, the combination of Figma and Adobe Creative Cloud tools allows

for the creation of high - quality and interactive design.

In summary, the architecture of ChudoZnaiko is designed with an emphasis on modularity and extensibility. The main steps in the implementation include initializing the Svelte/ Svelte Kit application with integration with PocketBase, building interactive UI components, and ensuring smooth navigation through the directory structure. Flexible role access and an innovative AI-powered chat system provide a personalized and engaging user experience, creating a solid foundation for future expansion and integration of new functionalities.

RESULTS AND DISCISSION

Accessing the platform from a desktop device initially presents the user with a landing page featuring the project's logo, slogan, selected illustrations, and a call-to-action button "Learn More". Activating this button redirects the user to a page providing a concise overview of ChudoZnaiko, accompanied by a second button "Get Started". Selecting this option triggers a pop - up window that requires account registration or login, as access to platform content is restricted to authenticated users. Login via Google and a password recovery feature are also provided.

Fig. 1 shows the landing page, which presents some of the hand - drawn characters on the platform. The "Learn More" button prompts the user for additional interaction on the site. The user profile icon is visible in the upper right corner, which provides easy login to the platform and quick access to its content.

Fig. 2 presents a short description of the platform and its benefits to the user.

Fig. 3 is a Pop - up when clicking on the account icon, through which the user has the option to log in to an existing account, create a new password, or create a new account. Logging in with Google is also possible.

Following successful authentication, the user is directed to the home page, designed with an emphasis on simplicity and intuitive navigation to ensure accessibility for a wide range of users. The interface highlights three primary categories: Animations, Educational Games, and Profile, which are also accessible through the navigation menu. The menu additionally includes a search function and an About Us section.

Fig. 4 is the home page, which shows three main sections - animations, games and a profile section. The profile section displays a greeting, customized by the user, as well as their favourite content below it. This way, the user has faster

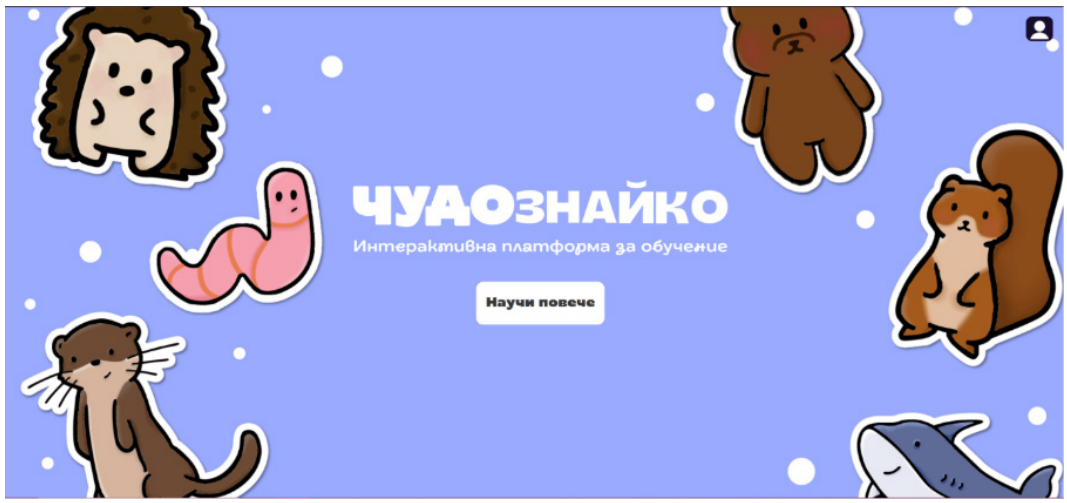

Fig. 1. Landing page.

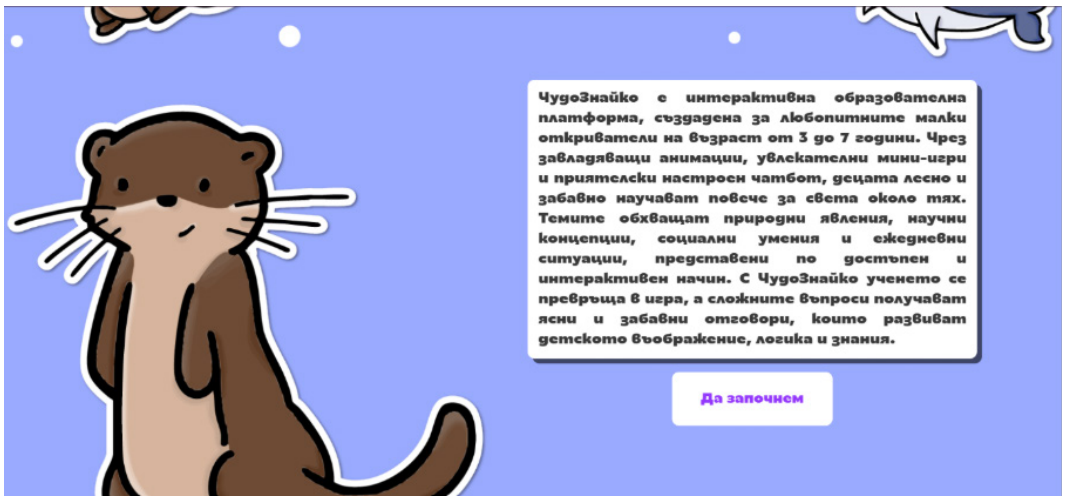

Fig. 2. More information about the platform.

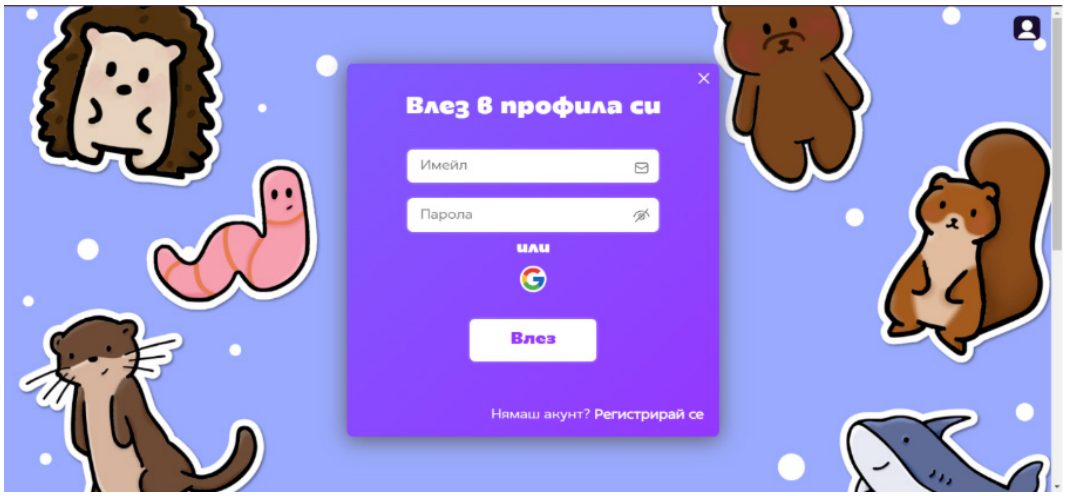

Fig. 3. Sign up, login or forgotten password.

Fig. 4. Home page.

access to what they want on the platform. The navigation bar contains the logo, which is a button to return to the home page, buttons for the animations, video games, “About Us” page, a search engine and a profile button.

The animations section presents a gallery of video content. Selecting an item opens a dedicated page containing a short description, the embedded video, and an interactive communication panel with the AI assistant ChudoBot. The assistant is pre - trained on the relevant subject matter and provides contextually appropriate responses. To ensure safety and ethical use, its functionality is limited to topics suitable for young children. Each animation entry also includes options to like the content or save it to Favourites, allowing personalized content management within the user profile.

Fig. 5 is an animation page and shows all the currently available and ready to watch animations. Also, the navigation bar is present.

Fig. 6 presents visualization of a separate animation with a viewing option, with a description of what is contained in it on the side, and the option for additional assistance from the chatbot below.

Fig. 7 presents a response from the chatbot for a given question.

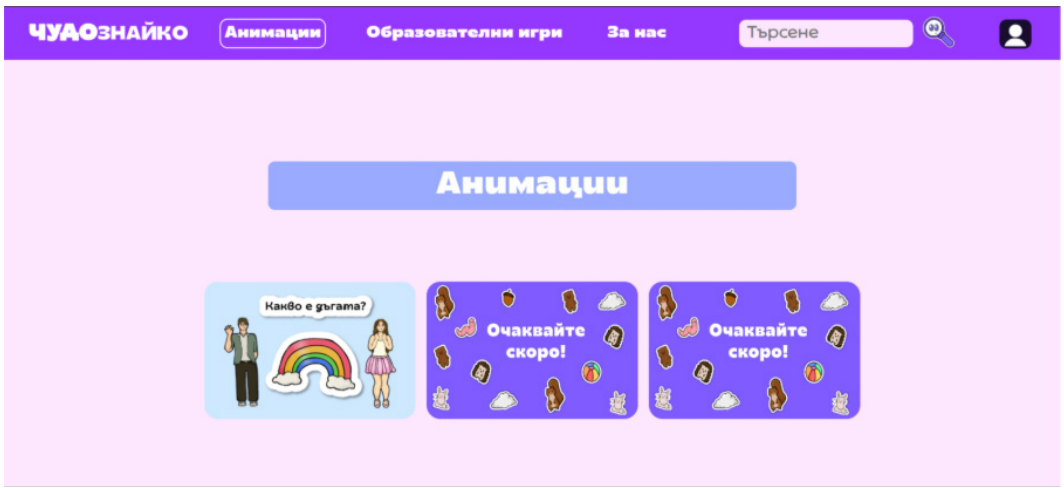

Fig. 5. A page with all the animations.

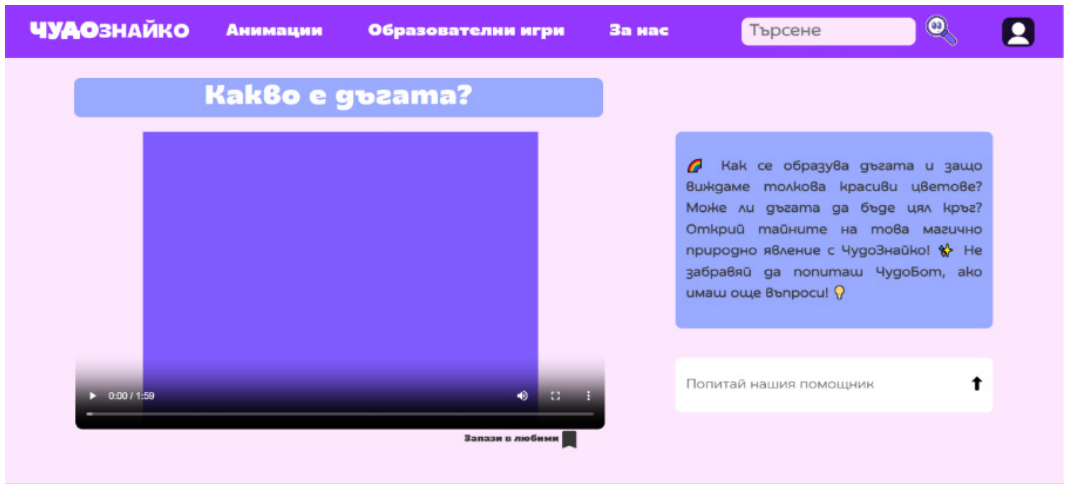

Fig. 6. A page for one of the animations.

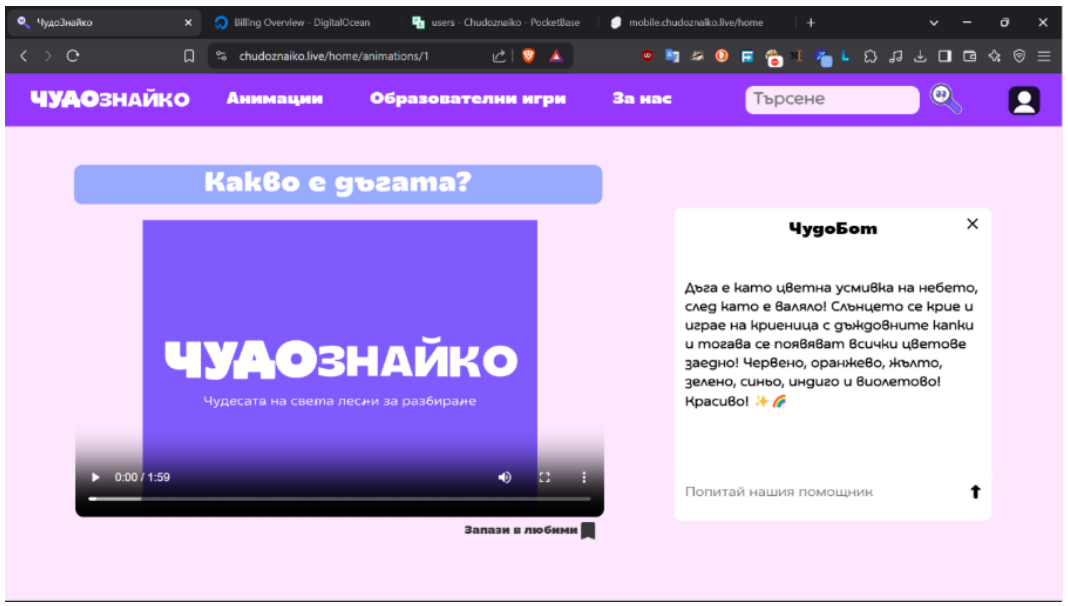

Fig. 7. The chatbot's behaviour.

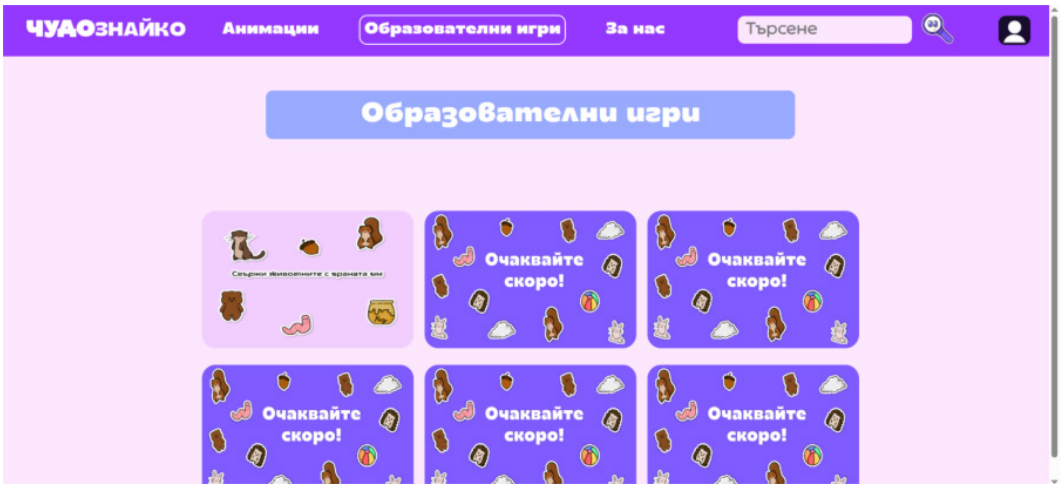

Fig. 8. A page with all the games.

The Educational Games section mirrors this functionality. Each game is accompanied by a description, detailed control instructions, and gameplay guidance. Users may like or save games to their profile for quick access.

The game page (Fig. 8) shows all the currently available and ready to play games. Also, the navigation bar is present.

Visualization of a separate page video game for recognizing animals and what they eat is presented in Fig. 9. If an error is made in connecting the pairs, chances are given to solve correctly.

The profile page displays user - specific data, including email address, password management options, and curated collections of favourite animations and games. Additionally, a system of achievement badges is implemented to reward user progress, such as completing animations or advancing within games. Profile images are currently auto generated via an API, with planned future functionality enabling users to upload

custom profile pictures. The profile section is designed to evolve as the platform introduces additional features.

The About Us page incorporates stylized illustrations of the project authors, rendered in the artistic style of the animations, accompanied by concise descriptions of their roles in the development of the platform.

The search functionality allows users to locate specific animations or games across the site. Furthermore, the navigation bar provides quick access to the profile pop - up, which displays the registered email and offers a logout option.

Fig. 10. presents functionality of the search bar.

Fig. 9. A page for one of the games.

Fig. 10. Search bar.

When accessed via a mobile device or tablet, the platform prompts the user with an installation option, transforming the site into an application - like experience. As with the desktop version, user authentication is required before accessing content. The mobile home page replicates the main categories of Animations and Educational Games, with the navigation menu optimized for display at the bottom of the screen. Video content pages include filtering options to streamline category selection, while the interactive features (liking, saving, sharing, and profile access) remain consistent with the desktop version.

In both desktop and mobile environments, the user interface (UI) and user experience (UX) are purposefully designed to remain consistent, intuitive, and accessible, ensuring ease of use for children while also accommodating parental oversight.

CONCLUSIONS

In this development, the educational platform ChudoZnaiko was created, which successfully fulfils its main goal - to support learning through interactive animations, games and personalized activities. Through fun and engaging methods, the platform makes learning accessible and interesting for children, combining game elements with educational content.

Through interactive animations, mini - games and an AI assistant, it stimulates children's curiosity and logical thinking. The project is the first of its kind in the country, with an innovative approach and inclusive design.

The additional goals were also achieved. ChudoZnaiko provides parents and teachers with an effective learning tool that not only facilitates the understanding of complex topics but also encourages curiosity and independent discovery of knowledge. Through adaptive content, the platform motivates children to learn in a natural and fun way, developing their creativity and logical thinking.

The following options can be considered for the future development of ChudoZnaiko:

- Expanding the catalogue of animations and games, covering new learning areas and topics.
- Implementing adaptive learning that personalizes the content according to the individual progress of the child.
- Introducing social features that allow for collaborative learning and competitions between children.
- Integration with other educational resources and platforms for an even richer learning experience.
- Translating the platform into other languages.

With its intuitive and engaging content, ChudoZnaiko has the potential to establish itself as a leading platform for early childhood education, which will continue to develop in support of young curious people.

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