Ministry of Education and Science of the Republic of Kazakhstan

Astana IT University

**Report**

**On Industrial internship program**

**Base of practice: «Kazakhstan Center of Public-Private Entrepreneurship JSC»**

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**Educational program:** «Software Engineering»

**Group:** SE - 2101

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**1.Introduction**

Participation of students in practical activities within organizations plays a significant role in preparing them for their future professions. Practical experience enables students to consolidate their knowledge and skills, which is a decisive factor for their future success. Furthermore, it allows them to apply theoretical concepts in practical settings and adapt to the social and psychological aspects of their future workplaces.

Between March 6th and April 1st, 2023, I undertook an internship as a software engineer at the JSC Kazakhstan Center for Public-Private Partnership. This internship provided me with a unique opportunity to acquire valuable work experience in a real-world environment and gain insight into the workings of state institutions. While involved in numerous processes within the organization, my primary task was to develop a web application for the Non-profit Joint Stock Company «Turar Healthcare», one of the partnering organizations. The primary focus of this report will be on the web applications developed for this organization.

The development of the Kazakhstan Public-Private Partnership Center JSC website is currently being undertaken by foreign experts on WordPress. As the Chief IT Manager overseeing my work, my manager believed it was premature for me to work on a project of this magnitude and, therefore, assigned me one of the tasks previously allocated to an employee. Subsequently, I will provide a detailed account of all the tasks I have undertaken. Naturally, the majority of this report will revolve around the process of web application development.

**2.Main part**

**I. Missions and goals**

To commence, I would like to provide a detailed overview of Turar Healthcare, the organization where I completed my internship. The company was established with the objective of serving as the national operator in the healthcare sector, responsible for executing investment and public-private partnership projects in the field of healthcare.

On the initial day of the internship, I had the opportunity to meet with Rysdaulet Nurbek Makulbekovich, the Director of the Administrative Department, who also functions as the Corporate Secretary. He acquainted me with the company's objectives and assigned me the task of creating a web application from scratch, based on the design of an outdated WordPress website with an admin application, enabling complete modification of all web application content. The following objectives were set:

* The content should be available in three languages (Kazakh, Russian, English).
* There should be a constructor for producing dynamic and nested pages.
* A slider featuring the organization's partners with links to their respective websites should be included.
* A map of objects that will be filled with cities where the organization has operated should be added.
* A press center page must be created, which will store all published news, some of which may be related to the map of objects.
* A blog of the chairman should be incorporated, where messages will be sent to the organization's mail and checked for accuracy in the admin page.
* All of these data should be available in the admin page with the ability to modify/delete data.

As I was required to develop web applications, I opted for the MERN technology stack, which is one of the most popular stacks consisting of MongoDB, Express, React.js, and Node.js. The development of three applications commenced almost simultaneously, including:

* The backend application built on Node.js.
* The frontend application for the main website developed on React.js.
* The frontend admin application constructed on React.js.

**II. Internship activities**

During the initial days of the internship, a thorough analysis of the structure of the previous website was conducted, and subsequently, the database and server components were constructed. Upon inspection, it was identified that certain data entries were replicated on the website, prompting the decision to segregate them in a separate collection named "General Information" (as illustrated in Figure 1). The resultant database architecture is presented in Figure 2, and details regarding other collections will be furnished later.

Subsequently, the task of designing page layouts was undertaken using a dedicated project (as illustrated in Figure 3). It was determined that these pages would be developed from scratch due to the presence of erroneous HTML/CSS code in the previous website. To facilitate the development process, various tools such as SCSS, Gulp, etc. were utilized.

During the following days, I engaged in the development of the backend application using Node.js, along with various libraries (as depicted in Figure 4). Within this development, various components were created including models, controllers, middlewares, and validators. The controllers were categorized as public or private based on the presence or absence of the middleware ‘checkAuthAdmin’. In the process of developing the backend application, I acquired expertise in utilizing server-side validators, segregating files that are loaded via multer, implementing nested schemas in modules, and other relevant techniques. The Insomnia program was utilized to perform testing and to send HTTP requests. The entire set of routers can be observed in Figure 5.

After creating the backend application, I started working on the frontend part. To begin with, the pre-compiled pages at the beginning of the production practice were divided into react-component, and routing based on React Router was built. Next, I started connecting the server and client parts, first I used the fetch API, but later I started using axios for these tasks.

**III. Application deployment and project delivery**

At the beginning of the fourth week, I finished all the applications, with all the corrections that I received during development. And after that, the project was fully approved, I started uploading the application to the hosting. After I implemented all the ideas of the customers, I was entrusted with the account data Hoster.kz. A subdomain was created for the deployment of the backend of the application backend.turar.kz, and Plesk settings were made to load Node.js application. The admin.turar.kz subdomain was created for the application admin.kz and the react application was loaded, which had already been built. The same was done for the main application, and now you can find this application at test.turar.kz. Since the materials for the site have not been transferred to me yet, the site is on a test domain.

## **3.Conclusion**

During my industrial practice, I successfully developed a MERN stack web application for the non-profit joint-stock company, Turar Healthcare. As a result of my work, a functional and multilingual web application was created, which met the customer's requirements and contained all the necessary features.

Throughout the entire industrial practice, I acquired new knowledge and skills in MongoDB, Express, React.js, and Node.js technologies, which allowed me to successfully implement tasks and develop both the backend and frontend applications according to the customer's requirements.

In addition to the primary technology stack, I used various development tools such as SCSS, Gulp, Insomnia, which helped me accelerate the work process and improve my skills while expanding my knowledge in related tools.

Despite the successful completion of the project, I believe that there is still a need to further expand my foundational knowledge in web development, particularly in a more in-depth understanding of my React.js skills.

This industrial practice has provided me with invaluable practical experience, helping me enhance my knowledge and understanding of various web technologies, best practices, and project management methodologies. I am confident that these experiences will enable me to become a better software developer and continue to grow professionally in the field of web development.

**4. Characteristics**

**АО «Казахстанский центр государственно-частного партнерства»**

Характеристика с места прохождения

Студент Жексенов Адиль Саятович успешно прошел производственную практику, продемонстрировав свои отличные качества и способности в работе. Он был ответственным, исполнительным и нацеленным на результат сотрудником, который успешно выполнял поставленные задачи, регулярно отчитывался о проделанной работе и проявлял инициативу в решении проблем.

Студент также проявил свои высокие профессиональные навыки в сфере веб-разработки, демонстрируя хороший уровень знаний и умений в этой области. Кроме того, он был дисциплинированным и организованным сотрудником, всегда приходил на работу вовремя, выполнял свои задачи качественно и в срок, и хорошо справлялся с коммуникацией в коллективе.

Во время работы изучал технологии для создания веб приложений. В случае возникновения трудностей, студент самостоятельно пытался найти решения, а также быстро усваивал новую информацию и успешно адаптировался к новым задачам.

За время прохождения производственной практики продемонстрировал свою высокую профессиональную подготовку и готовность к будущей карьере. Он был достойным представителем своего университета и оставил положительное впечатление.

Рекомендуемая оценка \_\_\_\_\_\_\_\_\_\_\_\_\_

Руководитель практики

от организации, должность: Садыков Б.С. (главный менеджер IT)

«\_\_\_\_\_» \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2023 г.

**5. Calendar plan**

**КАЛЕНДАРНЫЙ ПЛАН-ГРАФИК ПРОХОЖДЕНИЯ ПРАКТИКИ ОТ ПРЕДПРИЯТИЯ**

Жексенова Адиля Саятовича, студента 2 курса, образовательной программы “Программная инженерия”, период практики с «6» марта 2023 г. по «1» апреля 2023 г.

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| --- | --- | --- | --- | --- |
| №  недели | Наименование работ | Сроки исполнения | Название подразделения или рабочего места | Отметка об исполнении |
| 1 | 2 | 3 | 4 | 5 |
| 1 неделя | Ознакомление с задачами и верстка статичных страниц предыдущей версии сайта. | 06.03 - 12.03 | Департамент административно-правового обеспечения | Успешно выполнено |
| 2 неделя | Создание backend на Node.js и создание frontend админ приложения на React.js. | 13.03 -19.03 | Департамент административно-правового обеспечения | Успешно выполнено |
| 3 неделя | Создание frontend основного приложения на React.js и изменение структуры базы данных и backend на мультиязычный. | 20.03 -26.03 | Департамент административно-правового обеспечения | Успешно выполнено |
| 4 неделя | Загрузка всех приложений на хостинг и сдача проекта. | 27.03 -01.04 | Департамент административно-правового обеспечения | Успешно выполнено |

*Руководитель практики от предприятия*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Садыков Б.С.

*Руководитель практики от AITU* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Айтмұханбетова Э. А.

*Подпись обучающегося* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Жексенов А.С.