Universitatea Tehnică a Moldovei

Sistem de închiriere a bicicletelor Bicycle Rental System

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REZUMAT

Teza **Sistem de închiriere a bicicletelor**, prezentată de Dorin Popa ca teză de master, a fost scrisă la Univesitatea Tehnică din Moldova în Chișinău. Teza este scrisă în Engleză și conține 50 pagini, 26 figuri, 0 tabele și 16 referințe. Teza este compusa dintr-o listă de figuri, introducere, 3 capitole, concluzie și lista de referințe.

Această teză este dedicată studiului si cercetarii unui sistem de inchiriere de biciclete in contex- tul infrastructurii curente, domeniile ce necesita a fi atintse pentru realizarea unui asemenea sistem, costurile efective pentru realizarea sistemului, consecintele implementarii unui asemenea sistem si desigur analiza si implementarea scheletului acestui sistem de inchiriere de biciclete.

Referitor la dezvoltarea propriu-zisă a sistemului s-au utilizat următoarele limbaje de progra- mare - Java și JavaScript. Scopul proiectului este de a dezvoltă și proiecta o aplicație mobilă care permite utilizatorului să vizualizeze, caute, broneze și închirieze o bicicletă care ar urmă să salveze toate datele necesare pe un server dedicat acesteia care la rîndul sau pentru persistența utilizează o baza de date noSQL - MongoDB.

Utilizatorii vor fi apți să vadă statistici bazate pe experiențele proprii utilizînd aplicația și istoria ˆınchirierelor.

Sistemul de asemenea va avea nevoie de o pagină de administrator pe care un administrator va fi apt să facă acțiuni asupra datele ce țin de profilul sau, statutul bicicletelor și al locurilor de parcare, care ulterior pot fi modificate.

Alte sisteme de închiriere a bicicletelor au cu siguranță, de asemenea, careva web servicii pe care are loc salvările și manipulările cu datele importante din aplicația mobilă, dar din păcate nici unul dintre ele nu este open-source sau dacă și este atunci lasă de dorit modul de implementare și performanța cu care se bucură activitatea acestui serviciu. Respectiv acest sistem dezvoltat în această lucrare ar trebui să fie o soluție excelență în special datorită modului elegant de a brona, vizualiza statistică, folosirea generală a aplicației mobile și performanța de care sistemul ar trebui să deie dovadă pentru un număr solid de utilizatori.

Cele trei capitole prezentate în această lucrare sunt: prezentarea generală a sistemului de închiriere a bicicletelor, analiză domeniului și cercetarea în special în domeniul ecologic a sistemului, elemente de proiectare și de implementare a funcționalului.

Primul capitol descrie detaliat analiză domeniului și impactul din diferite puncte de vedere a sistemului asupra societății noastre. Finalizind cu un studiu de caz concret cu exemplul Chișinăului.

În capitolul doi sunt parțial prezentate unele părți mai importe de proiectare a sistemului cu ajutorul diagramelor UML și de asemenea explicarea lor.

În ultimul capitol este prezentata implementarea de facto a proiectului cu detalii tehnice refer- itor la tehnologiile folosite și exemple de cod. De asemenea sunt incluse și imagini care parțial oferă o închipuire a ceea ce oferă funcționalul.

ADNOTATION

The Thesis **Bicycle renting system project** presented by Dorin Popa as a Master degree project, was developed at the Technical University of Moldova in Chisinau. It is written in English and contains 50 pages, 26 figures, 0 table, and 16 references. The thesis consists of a list of figures, introduction, three chapters, conclusion, and references list.

This thesis is dedicated to the study and research of a bicycle rental system in the context of current infrastructure, the areas that need to be addressed to achieve such a system, the actual costs for the implementation of the system, the consequences of implementing such a system, the skeleton of this bicycle rental system and of course the analysis and implementation of the framework of this bicycle rental system.

Regarding the actual development of the system, the following programming languages were used - Java and JavaScript. The project aims to develop and design a system based on WEB server that will allow the user to visualize, find, book and rent a bicycle on the mobile application and storing all the needed data on this server which on its order uses a noSQL database - MongoDB to persist data.

Users will be able also to see some statistics based on its own experience with the application and the renting history.

This system will need also a administration page where an system administrator will be able to perform actions on data regarding the user's profile, bicycle status and bike-parkings which can further be modified.

Other systems of bike sharing for sure also have under the hood some server side application to store and manipulate important data on the application, but unfortunately none of them is open- source or either has a painful implementation. So, this system developed in this thesis should be an excellent solution, especially due to the elegant way of tanning, viewing statistics, the general use of the mobile application and the performance that the system should prove for a solid number of users.

The three chapters presented in this paper are: the general presentation of the bicycle rental system, the analysis of the field and the research especially in the ecological field of the system, elements of design and implementation of the functional.

The first chapter describes in detail the analysis of the field and the impact from different points of view of the system on our society. Concluding with a concrete case study with the example of Chisinau.

Chapter two partially presents some of the more important parts of system design using UML diagrams and also their explanation.

The last chapter presents the actual implementation of the project with technical details re- garding the technologies and code examples. There are also included some images that partially provide an idea of what the functional offers.

Contents

INTRODUCTION

People nowadays live in a era full of technologies which make the world more pleasant and dif- ferent day by day. Everybody tend to come with a solution which should help somehow the society or at least themselves. An actual problem in Chisinau is the transport especially in the rush hours which can be somehow resolved and thanks to other cities faster development it can be find out a ecological solution by using another transportation method - the bicycles. Why it's a great idea ? because they are not emanating exhaust gases in atmosphere as the vehicles with internal combustion engine especially on diesel and methane. More than that in order to move there is a need of physical effort to transport the body from point A to B which would increase the health level of those part of city's population which will choose this solution.

There will be a dedicated section in this thesis for a concrete case study comparison between fuel cars and bicycles gas emission which shows how drastically the situation can be improved at several chapters like ecology, time spent, money and health.

There are lots of people which can't afford themselves to use a bike and the possibility to rent one if pretty small due to the fact that there are only 2-3 parks where there are people offering bikes for rent, about 300 bikes.

Of course there are a few thousands of people which would like to afford themselves to rent a bicycle for their transportation despite a taxi or a personal car, especially on sunny days without rain and storm.

So these problems generated the idea of realizing such a project in Chisinau and this thesis illustrates how that can be possible and how big is indeed the impact of such a system, considering our country, our capital.

The whole project comes in tandem with the mobile application that would present the data regarding parking stations for bicycles where anybody who is registered could come with their phones and bring a bicycle themselves.

The set of technologies presented in the thesis are according to the newest trends in the world of software engineering, their relatedness to the project is explained in details, also why were they used in order to develop the final product.

Also whole process of defining the idea of what data should the server contain, the modeling and analysis of the idea to the implementation of the product. After all there also is needed a marketing plan and a solid analysis from the economical point of view which is required for the investors and the stakeholders interested to the realization of the whole idea illustrated in this thesis.

All the third party information is referenced at the end of the thesis in a specific standard way at the end of that information with a specific [x] where x - the number of reference item. Also in the thesis it can be found specific key-words abbreviations which have an important meaning and should be found at the beginning of the document in the abbreviations section.

REFERENCES

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