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Advanced Web-Based Customer Taxi Appointment Request System

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Abstract

In today's rapidly digitalizing world, significant transformations are also taking place in the service sector. In this context, the taxi industry is also being reshaped by technological innovations. A study was conducted in the literature to reduce traffic congestion. In this study, a webbased online taxi calling and control application was developed. This application was implemented to ensure that users receive safer, faster and more comfortable transportation services. This study aims to prevent security problems that may arise in the taxi industry. Since the application allows the information of the taxi driver and the passenger to be easily visible on the system, it is aimed to prevent situations such as loss of belongings and events that could endanger the life of the taxi driver. With the study, an innovative platform was presented that aims to improve the experiences of both passengers and taxi drivers. Thanks to user-friendly interfaces, users can easily make a taxi appointment and choose the driver they want. This application, which has a dynamic structure, was coded in the PHP programming language.

Keywords: "Taxi, Customer, Security, Appointment."

1. Introduction

Taxi appointment systems are very important for both taxi drivers and customers to avoid wasting time. In such applications, it is also important for customers to be able to choose the taxi driver as they wish. Disruptions in the transportation system caused by traffic density are one of the common problems that many cities have to deal with [1]. Instant or long-term disruptions in traffic may occur due to many reasons, especially in the city center, such as car parks in wrong locations, density of pedestrians and vehicles, lack of sufficient physical infrastructure on the roads, individual vehicle users, etc. Many simulation and analysis processes are carried out by relevant institutions to predict or solve such problems [2,3]. Cui et al. they drew attention to the increase in population and developments in technology in the developing world and its cities [4]. Chen et al. they stated that people's preferences for getting on and off taxis are generally hospitals, shopping malls or city centers [5]. Traffic density, which has become one of the biggest problems of cities day by day, can sometimes reach the highest levels. On the other hand, it is very important to be careful about any problems that may occur in transportation, to work against the problems and to take precautions to protect the sustainability of transportation, which is directly related to the living standards of city residents. Commercial taxis also bring about transportation problems such as insufficient control of businesses, inability to integrate with other means of transportation, and in cases where the demand for commercial taxis is irregular, taxi drivers wander around the city idly, occupying traffic unnecessarily [6]. Öztemiz et al. they stated that traffic problems in residential areas are serious problems that need to be solved [1]. Wong and Szeto stated that the demand for commercial taxis is irregular [7]. In a different study conducted by Engin, it was emphasized that public transportation and taxi service are very important elements in transportation for city residents [8]. A different remotely controlled web-based study was conducted [9].

A detailed and useful web-based application was developed to solve such problems. This application aims to prevent such problems.

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2. Material and Methods

The web-based Taxi Management System in this study was developed using PHP, MySQL, HTML, CSS and JavaScript programming languages. From our navigation bar, users can log in, register, view drivers, and send contact e-mails. Admins can also log in from here. The general view of the developed application is shown in Fig. 1.



Fig. 1. General interface view

Among the drivers rated by passengers, those with the highest scores are displayed on our homepage. In this way, users are provided with convenience in choosing a driver. In addition, it is aimed to provide better service to passengers by asking drivers to enter their favorite drivers list. The developed favorite drivers interface is shown in Fig. 2.



Fig 2. Favorite Drivers Interface

In our drivers interface, drivers added to the system by the admin are listed. The drivers interface is shown in Fig. 3.



Fig. 3. Drivers Interface

Details of the driver can be seen by pressing the view button. The developed interface is shown in Fig. 4.

●Jogin ADrivers B Contoct 🛓 Register →) Admin Login	
	Driver's Name: Set
	Plate: 68 T 5200
	Phone: +90 5
AN SHUMMENT	Mail: su@ .com
	Vehicle: Mercedes Vito VIP
Posted With Ite	. . .

Fig. 4. Driver Detail Interface

Users can give us their opinions on our contact page. The message is sent to the admin via e-mail. The developed interface is shown in Fig. 5.

toisi →Login A Drivers E Contact	よ Rogister 🛛 Admin Login		
		â.	
	Let Us Know Y	our Feedback	
	Süleyman Meral	I was very pleased with your driver named Selim Uzun. He was a so polite person.	
	mrisly 2@gmail.com		
	+90 000		
	SUB	МІТ	

Fig. 5. Communication Interface

The sent e-mail reaches the admin's e-mail address. Users can register to the system by entering their information in the user registration interface. The developed interface is shown in Fig. 6.

- Slagin Rünkers @Contact ⊉Register +3Adminilagin	
	We Are Happy To See You Among Us
	Name
	Last Nome
	Phone
	Mall Adress
	Usemame
	Password
	Register

Fig. 6. User Registration Interface

Users can log in to the system with their own username and password. The login screen developed for this is shown in Fig. 7.

tolial 🔹 Login 🚔 Drivers 🖪 Contact 🔩 Register 🚽 Admin Login		Î
	🖨 User Login 🛱	
	Username	
	Password	
	Login	
	Register	

Fig. 7. User Registration Interface

After logging in, users can create, view, cancel and edit appointments. The person's username also appears in the navbar. The developed interface is shown in Fig. 8.



Fig. 8. User Home Page Interface

Admin can determine the appointment date range via the admin panel. Appointment requests are not created outside the date range. The warning is shown to the user via notification as in Fig. 9.



Fig. 9. Invalid Date Notification

After making an appointment, an e-mail is sent to the user and the admin. The user has the opportunity to cancel and edit the appointment until the admin confirms the appointment. The developed appointment booking interface is shown in Fig. 10.

	🖨 Make An Appointm	nent A
	Username suleymanmeral53	
	Name And Last Name:	
Α	Süleyman Meral	
	ANKARA	~
	ÇANKAYA	~
	Departure Address Kizilay Axm	
	Date And Time	

Fig. 10. Appointment Interface

After the appointment is made, the user is notified and the appointment is placed on the My Appointments page awaiting confirmation. This process is shown in Fig. 11.

to isi ber late	s ©	Create An Appointm	ent 🛯 📽 My App	pointmer	nts 💄 My Profile 📑 Contact	Welcome suleymanmen	al53	🕩 Log Out		
			муло	ctive App	pointments Appointments Pence	My Past Ar waiting App	opointr	nents Val		
	Id	Username	Name	Dep	Your appointme	nt has been		Phone	Transactions	
	54	suleymanmeral53	Süleyman Meral	ANK Kizil	made successfu be informe Administrator	ully. You will d after Approval.		+90 538 377 0310	Düzenle İptal Et	
	Prev	rious 1 Next			OK					
Contact With Us:										f. ⊯. G
	O	NLINE TAKSI			SERVICES	USEFUL LINKS		CONTACT		

Fig. 11. Interface After Making an Appointment

Appointments made by users are sent to the admin via e-mail. As an example, it is shown in Fig. 12.

The user named suleymanmeral53 has created an appointment request. You can see the appointment by clicking on the link. http://localhost/onlineTaksi/admin/ad_randevular.php
 ← Yanıtla ← Yönlendir
Alici; ben ★ Your appointment has been created successfully and you will be informed after the administrator's approva

Fig. 12. Appointment Email Sent to Admin

The user can cancel the appointment by specifying the reason for cancellation. The reason for cancellation is communicated to the admin via e-mail. The appointment cancellation interface is shown in Fig. 13.



Fig. 13. Appointment Cancellation Interface

Admin logs into the system with username and password from the login screen. The developed admin login interface is shown in Fig. 14.

toisi →Login 🛱 Drivers 🖪 Contact 🔮 Register →) Admin Login	
	🖨 Admin Login
	Utername admin
2	Possword
	Login
	New Admin register
Contact With Us:	💌 G. 🝭 🗮 O

Fig. 14. Admin Login Interface

The admin can view appointments, change the appointment date range, and view driving evaluations from his own panel. The general interface of the admin page is shown in Fig. 15.



Fig. 15. Admin Page General Interface

Admin can determine the appointment date range from the date setting section. The interface developed for this is shown in Fig. 16.

taksi	A Driver Transactions 🗯 Set Date 📫 Reviews Ap	pointments T Alog Out		
	Starting Date	End Date	Transaction	
	01/05/2024	15/07/2024	Change Date	_
Contact Wit	h US:		G g	o 🖬 🗭

Fig. 16. Date Setting Interface

The appointment date range can be changed from the change date button. The developed interface is shown in Fig. 17.

toksi Appointments Acount Constructions		
	A Date Change A Starting date dd/mm/yyyy End Date dd/mm/yyyy Save	
		🥩 Gୁ 📴 🛱 ମ

Fig. 17. Date Change Interface

Admin can add drivers to the system, delete drivers and make edits from the driver transactions section. The developed driver operations interface is shown in Fig. 18.



Fig. 18. Driver Operations Interface

Admin can add new drivers to the system via the driver adding interface. The developed interface is shown in Fig. 19.



Fig. 19. Driver Addition Interface

Admins can see the reviews in the reviews section. The interface developed for this is shown in Fig. 20.

			Eva	luation (1-3)		
Randevu Id	Driver	Şoförün Size Karşı Davranışı	Araç Konforu	Şoförü Tavsiye Ederim	Sürüşten Memnun Kaldım	Tekrar Online Taksi Kullanırım	Uygulama Hızı
27	M	3	3	3	3	2	3
31	Nil Ko pn	3	2	2	3	3	3

Fig. 20. View Reviews Interface

Admin can change the questions from the evaluation questions changing interface. The developed interface is shown in Fig. 21.

taksi 🖨 Driver	iver Transactions 🗮 Set Date 🕡 Reviews Appointments 👻 🛱 Log Out									
	Question 1 Şoförün Size Karşı Davranışı	Question 2 Araç Konforu	Question 3 Şoförü Tavsiye Ederim	Question 4 Sürüşten Memnun Kaldım	Question 5 Tekrar Online Taksi Kullanırım	Question 6 Uygulama Hızı				
Contact With Us:								G. @. 🖪 (

Fig. 21. Evaluation Questions Changing Interface

Appointments made by users are displayed on the appointments pending approval page of the admin. Admin can approve or reject the appointment from here. The reason for rejection is communicated to the user via e-mail. The interface for appointments awaiting approval is shown in Fig. 22.

			Аррс	ointment	s Penc	ling A	pprov	al	
Id	Kullanıcı Adı	Adı Soyadı	Departure Adress	Departure Date	Destination Adress	Driver	Phone	Status	Transactions
49	esm	Es Ya gar ar	KARS SUSUZ Otogar	28/05/2024 15:00:00	RİZE MERKEZ Taşlıdere Mah	Mennet Y	+90 0000000 7 0177	Onay Bekliyor	Approve Cancel

Fig. 22. Admin Appointments Pending Approval Interface

Confirmed appointments appear on the active appointments page. An e-mail is sent to both the admin and the user 1 hour before the appointment. Admin can end the appointment from this screen. When the appointment ends, it can be viewed on the past appointments page. And an e-mail is sent to the user to rate the appointment. The developed confirmed appointments interface is shown in Fig. 23.

Active Appointments									
Id	Username	Name	Kalkış Adresi	Kalkış Zamanı	Varış Adresi	Driver	Phone	Status	İşlemler
48	suleyr 53	Süleyman Meral	AKSARAY MERKEZ Otogar	30/05/2024 12:30:00	AKSARAY MERKEZ Aksaray Üniversitesi	Fat	+90 5	Onaylandı	Done

Fig. 23. Admin Approved Appointments Interface

Users can view their completed appointments on the My Past Appointments page. They can score from here. The developed My Past Appointments interface is shown in Fig. 24.

toksi bir tur	A	Drivers 🔊 Create An A	sppointment 🤷 My	Appointments	L My Profile 🖪 Cont	act Welco	ome suleymanr	neral53 🚺 🚺 Log	Out	
			Active Appo	pintments A	ppointments Pending Ap	oproval My Po	ast Appointmer	nts		
	My Past Appointments									
	Id	Username	Name	Departure Adress	Departure Date	Destination Adress	Driver	Phone	Transactions	
	47	suleymc heral53	Süleyman Meral	AKSARAY MERKEZ Aral Yurdu	07/06/2024 17:30:00	AKSARAY MERKEZ Otogar	Fat h	+90 5	Rate	
	48	suleymann ter al53	Süleyman Meral	AKSARAY MERKEZ Otogar	30/05/2024 12:30:00	AKSARAY MERKEZ Aksaray Üniversitesi	Ecologia	+90 538 300000	Rate	
	Prev	ious Next								
	st With Us: 🛛 🖉 🖌 🚱 💆									

Fig. 24. User History Appointments Interface

The scoring result is averaged and the selected driver's score is updated. Evaluation results are also sent to the admin via email. The scoring interface is shown in Fig. 25. 74



Fig. 25. Appointment Scoring Interface

Users can view their profile and change their personal information from the My Profile tab. The developed profile interface is shown in Fig. 26.

toisi	🖨 Drivers 🧐 Create An Appointment 🖷 My Appointments 🔒	Livy Profile Contact Welcome suleymanmeral53 Flag Out
		A User Update A
		Name: Süleyman Meral
		Username: suleymmeral53
		Phone: +90 0310
		Mail: mrlslym @gmail.com
		Update
		Update

Fig. 26. My User Profile Interface

3. Conclusions and Future Works

As a result, our online taxi web application facilitates people's daily lives by offering them easy, fast and comfortable transportation. Users can plan their future work more easily by making appointments in advance. They do not face the problem of not finding a taxi. Thanks to its user-friendly interface and advanced features, it optimizes the business processes of both passengers and taxi stands. It prevents security problems that may arise in today's conditions by safely displaying driver and user information in the system. In case of losing their personal belongings, users can see the vehicle they used to ride, the driver of the vehicle and the driver's contact information through the application. In this way, they can cope with this situation without any problems. Additionally, thanks to the integrated scoring system, taxi stands can determine their favorite drivers and constantly improve their service quality. With this web-based application, the innovations we have brought to the taxi industry make a significant difference in the sector by responding to modern needs. In future applications, artificial intelligence support may be used in taxi driver recommendations.

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