

Rentaka A Car Rental Company

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Abstract— A car rental is a company in which the customer can get a automobiles service for short duration, generally ranging from a few hours to a few weeks. It comprises of numerous local branches (which allow a user to avail a car at on location and return the same at a different location), and primarily located near airports or busy city areas and often complemented by a website allowing online reservations. Car rental service agencies primarily serve their customers who do not own their own car, travelers who are out of town, or owners of damaged or destroyed vehicles who are awaiting repair or insurance compensation. Rentaka offers an easily available service with a high usability quotient to ensure smooth transportation.

Index Terms— Car Rental, Door Security, Identification, Radio Frequency, Near Field Communication, Wallet, Web Application.

I. INTRODUCTION

In today's world with the growing population of India and with the busy schedule of people, commuting is the main problem for many citizens. Many of the users have cars and some who can't afford it, have to either travel by public transport or rent a car for their use. In this case if a person wants a car for certain amount of time till his commute to a place, but still will have to pay the rental company the price for the whole day. Rentaka tries to resolve this problem, by allowing its users to rent the cars for certain time as per their convenience.

In these papers [1] [2] [3], the author has proposed:

RFID - SmartCard based security system:

The proposed system will require a RFID reader attached to the car door. It uses a smart card which will be used as an RFID tag to authenticate users. This smart card has information stored in it which will be immediately read by the RFID Reader when it comes in its near field region. The Reader takes this information and matches it with the information stored in it. On successful match, the user will be allowed to enter otherwise not. The following demonstrates the working of RFID based Door locking mechanism.

Methodology

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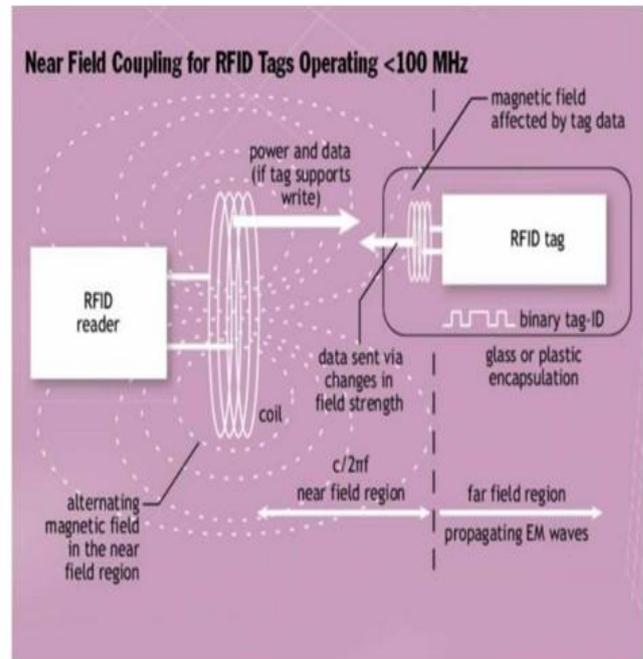


Fig. 1. RFID working Principle

II. RELATED RESEARCH

A. Door Security

Nowadays security is the most essential issue everywhere in the world; so security of everything gains higher and higher importance in recent years. Even in our context, the car door security gains utmost importance since it is the starting point of user interaction with the car. It is necessary to make sure that only authorized users be able to enter the car.

RFID systems operate from very low frequency (VLF) to extremely high frequency (EHF). RFID systems operating in the low frequency range use electromagnetic wave propagation to communicate their data and commands; these use passive tags. RFID systems operating in the low frequency range operate on the principle of near field coupling between tag and reader. In a near field RFID system, electromagnetic waves are transmitted by the reader which propagate outwards with a spherical wave front. Tags placed within the field collect some energy. Then an exchange of data between tag and reader takes place. The amount of energy available at any particular point is related to the distance from the transmitter as expressed as $1/d$ where d is the distance from the transmitter.

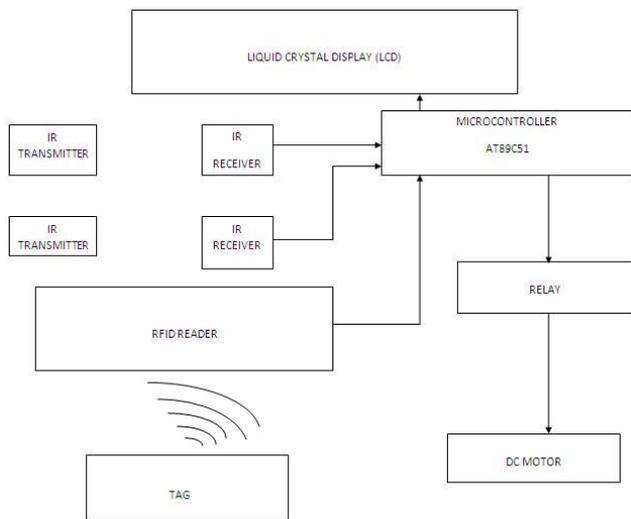


Fig. 2. RFID Block Diagram

RFID tag: A tag is the fundamental unit of operation. It consists of small chip and an antenna. The chip contains useful information and antenna is used to activate the chip and communicate with reader.

RFID reader or interrogator: The reader emits a pulse of electro-magnetic waves to the tag and wait for tag’s response. Upon detection, the tag returns a response that contains the tag’s serial number and other information as well.

Power conversion circuits: Power conversion circuits al-low individual modules to make use of existing power supplies.

Microcontroller: Microcontroller to be used is AT89C51.

Relay: Relay used is of 5V.

B. Existing System [6]

Client will book the car using Web or Mobile app. Then the client gets the available at the centre near a particular area the clients will have to go to the centre to pick up the car. The booking of the car is per day/ hour/months.

III. PROPOSED SYSTEM

In this paper, we propose an anonymous car rental service based on NFC technology and/or remote authentication using smart card. Our main features include:

Anonymity: Users provide their personal information to the app only. The car companies cannot get users real identity.

Self-drive: Users enjoy a seamless driving experience across a wide range of luxury cars.

RFID Smart Card: Users will be provided with app-associated smart cards which will be used for authentication.

Trace ability: If there are customer disputes or accidents, the rental company can track the users whereabouts.

Flexibility: Users are free to choose their preferred vehi-cle.

A customer has to register his identity via the app (or web-app) on his NFC phone. This registration should be also accompanied with license registration and verification against the drivers database. The customer should request a temporary anonymous personal identification number (pin) from the app whenever he desires to avail the services. If the license is valid, the company issues the pin for the requested vehicle to the user over the app. The vehicle authenticates the user through his/her NFC phone/smart card. Last, after the user is authenticated, the he/she is allowed to drive the car. When a car is returned, the rental company can collect the charges through a TTP (Trusted Third Party) or the built-in wallet facility. If customer disputes arise or there are accidents, the authorities can request to reveal the users identity.

A. Database

In order to validate the Drivers Credentials, we need data of all drivers from all areas across the region(city). Also, to simplify the process, we aim to generate our own dataset containing relevant features - name, licence number, driver history, age, etc... - using available technologies like python, excel, etc.

Last but not the least, a dataset that contains all the rfid keys which can be associated with the drivers primary keys (personal identification numbers for drivers registered with our app) is required which will provide the valid rfid tag id to the rfid reader on the car door (this will be used for unlocking the car door). This dataset also contains the passwords for the Key holder terminal discussed above which will open on entering the correct password provided through this data.

	A	B	C	D	E	F	G
1	STATI CITY	YEAR_ISSUED	DRIVER_ID	LNO	VALID TILL	DOB	
2	MH	12	2016 8201130	MH1220168201130	2036/02/05	1997/10/11	
3	MH	13	2002 1719325	MH1320021719325	2022/12/11	2008/06/29	
4	MH	14	2017 6229460	MH1420176229460	2037/01/10	2007/04/11	
5	MH	13	2000 0284037	MH1320000284037	2020/01/09	1994/10/13	
6	MH	14	2017 8963143	MH1420178963143	2037/09/16	1995/09/30	
7	MH	12	2012 5084459	MH1220125084459	2032/12/09	1994/05/22	
8	MH	13	2008 0565270	MH1320080565270	2028/05/16	2005/10/16	
9	MH	12	2003 6763277	MH1220036763277	2023/08/09	1991/07/15	
10	MH	13	2013 8507774	MH1320138507774	2033/01/10	1996/04/14	
11	MH	14	2005 2014325	MH1420052014325	2025/02/15	1990/05/18	
12	MH	14	2018 6380877	MH1420186380877	2038/10/30	2007/03/26	
13	MH	13	2003 7041015	MH1320037041015	2023/11/16	1992/08/26	
14	MH	13	2019 6751302	MH1320196751302	2039/03/30	1994/01/24	
15	MH	13	2007 5294340	MH1320075294340	2027/07/24	2002/02/22	
16	MH	12	2019 3868245	MH1220193868245	2039/05/10	1997/06/17	
17	MH	14	2002 9420428	MH1420029420428	2022/05/22	2008/12/24	
18	MH	13	2005 0114728	MH1320050114728	2025/12/10	1998/05/06	
19	MH	12	2010 5945066	MH1220105945066	2030/11/16	1998/05/12	
20	MH	14	2000 0316489	MH1420000316489	2020/03/01	1998/02/28	
21	MH	12	2005 4465784	MH1220054465784	2025/07/25	2006/11/12	
22	MH	13	2014 9962028	MH1320149962028	2034/04/17	1991/04/25	
23	MH	13	2017 8264613	MH1320178264613	2037/02/12	2000/10/09	
24	MH	12	2011 8271452	MH1220118271452	2031/11/22	1998/04/22	

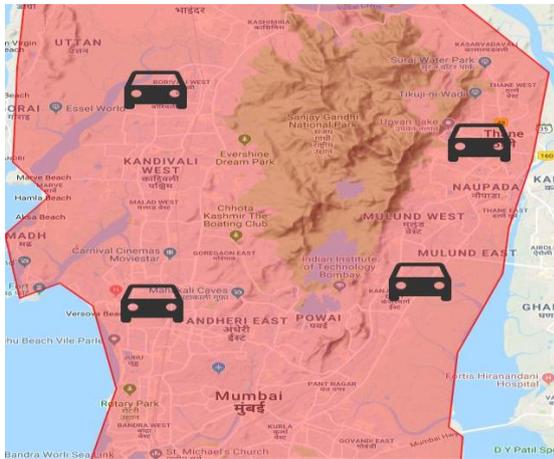
Fig. 3. RTO Database1

	A	B	C	D	E	F	G
9421	DL	13	2020	5376411	DL1320205376411	2040/10/20	1992/07/20
9422	DL	12	2009	9314639	DL1220099314639	2029/07/04	2008/06/08
9423	DL	14	2018	5962063	DL1420185962063	2038/06/13	2003/06/19
9424	DL	12	2003	0670082	DL1220030670082	2023/01/04	2010/02/27
9425	DL	12	2018	9408260	DL1220189408260	2038/11/24	1998/05/04
9426	DL	14	2016	0344732	DL1420160344732	2036/05/03	1998/02/26
9427	DL	12	2008	2880111	DL1220082880111	2028/04/05	1994/04/28
9428	DL	12	2008	7552242	DL1220087552242	2028/09/08	1995/04/14
9429	DL	12	2014	2751591	DL1220142751591	2034/10/08	2010/11/17
9430	DL	14	2004	4830560	DL1420044830560	2024/01/09	1999/10/04
9431	DL	14	2005	7650528	DL1420057650528	2025/06/24	2005/03/28
9432	DL	12	2019	6027690	DL1220196027690	2039/01/02	1993/08/14
9433	DL	12	2007	3764052	DL1220073764052	2027/01/18	2006/06/04
9434	DL	13	2009	1300346	DL1320091300346	2029/07/19	1991/05/02
9435	DL	12	2003	3130790	DL1220033130790	2023/03/22	2003/08/22
9436	DL	14	2010	9382659	DL1420109382659	2030/03/19	2008/09/04
9437	DL	14	2006	8263994	DL1420068263994	2026/08/27	2007/03/08
9438	DL	12	2013	6049237	DL1220136049237	2033/09/20	1990/04/09
9439	DL	14	2006	4326522	DL1420064326522	2026/11/05	1991/06/30
9440	DL	12	2013	1580077	DL1220131580077	2033/10/15	2005/12/15
9441	DL	14	2016	3989277	DL1420163989277	2036/11/14	2007/01/20
9442	DL	12	2009	8819745	DL1220098819745	2029/07/23	2004/03/17
9443	DL	13	2003	7637501	DL1320037637501	2023/08/08	2003/12/15
9444	DL	13	2014	2509510	DL1320142509510	2034/05/01	2003/02/25

Fig. 4. RTO Database2

B. Google API

In order to view view the cars nearby the user, and book the one nearest. The functionality is such that if the user click on the car pin in the map,it will redirect the user to the booking page. After the booking is done,it will generate a receipt Locations of the cars are updated on the database which extracted by a PHP script, which will call the XML-marker file which shows the cars on the google map.



IV. RESULT

A google form had been circulated to the public with the hosted web-application link. The response of 60% to 70% was achieved.

Would you please rate our Web App

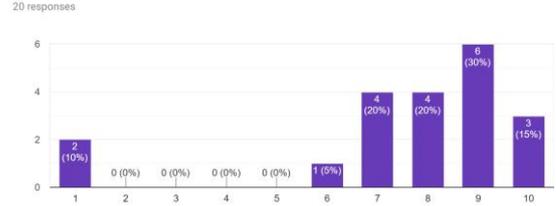


Fig. 6. Results

V. CONCLUSION

Hence, we conclude saying that we collectively aim at providing a delightful driving experience to users who cannot afford to get a car of their own, also to users thriving at experiencing a wide variety of automobiles, or to simply anyone in need of a car for transportation purposes. We also want to take the car rental definition to another level by making our cars available to users whenever and wherever they want.

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