Smart Renting of Vehicles using IoT

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Abstract: ***The inspiration behind this research is the developing prominence of online web based applications and the need to investigate the global positioning system (GPS) innovation that enterprises could take advantage of to improve their services to the clients. The main purpose of developing GPS-based content alert for car rental system is to make the car available for every common man with a minimum cost and effective use of time, which is beneficial to the car rental agencies and customers. Therefore, this IoT based application helps the customers to be comfortable and to have the privacy ride as travelling became the part of life. Travelling through cabs or any rental vehicles have become quite common in these days. Unfortunately, this system is confined to cities and towns. So, many of the rural people and the colleges which are situated in the remote areas are the major concern. To address this issue our application aids to provide a rental car system with GPS –GSM mode. Many of the people are having their own vehicles like bikes and cars and are remained in parking position for certain hours. Such situations are effectively utilized by the customers through hiring the cars for their personal use. This application gives the good results for both customer and the car owner.***

Index Terms**: *GPS-GSM Module, Internet of Things (IoT), Sensors.***

I. INTRODUCTION

IoT (Internet of things) is a frame work or a design in which different objects are connected and are controlled through internet and thus making our life easier in getting the things done. Some of the objects that we can see in our daily life are A/C and some smart chips like GPS module through which we can control track and even get the live status of the object. Each and every object is given a unique id or an IP address through which we can control. Implementation of IoT makes our life easier and also has a lot of pros like easy in getting the things done. IoT changes over a typical gadget into brilliant gadget. It is a biological system of programming, gadgets, sensor, machines, things, and some more.

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It speaks to a general idea for the capacity of system to detect and gather information from associated gadgets, and afterward share that information over the web where it very well may be handled and used for different purposes and choices.The IoT based arrangements can profit the entrepreneurs. They can improve operational effectiveness, upgrade profitability and diminish costs. They can screen numerous branch areas, staff exercises, vitality utilization examples, and then some. IoT sensors give constant alarms/notices upon any deviation in any procedure. For example, if any obscure individual is attempting to jump in your lodge in your nonappearance, you will get a moment cautions/warnings and you can take constant activities.

IOT offers unlimited open doors for business and society. It is an idea that has the ability to change the manner in which we live and work. The vision of the Internet of Things has developed because of an intermingling of numerous advances, including universal remote correspondence, continuous examination, AI, ware sensors, and installed frameworks. Organizations who figure out how to bridle the information made by the Internet of Things are the ones who will endure and flourish later on.

It stages can enable associations to diminish cost through improved procedure proficiency, resource use and profitability, helped by the downpour of connection and exchange information available to them. With improved following of gadgets/objects utilizing sensors and availability, they can profit by ongoing bits of knowledge and investigation, which would enable them to settle on more astute choices.

Actually the Internet of Things (IoT) takes into account for all intents and purposes unlimited chances and associations with occur, a large number of which we can't consider or completely comprehend the effect. When what we can do best is to instruct ourselves on different IoT advancements and continue trying different things with the new inclining innovation.

Many revolutionaries have changed from manual to the on the web system, especially in the work process and kind of assets that are put away in the vehicle rental administrations. The transformed from the customary vehicle rental framework to the advanced framework is unsurprising. In some cases, the sensor information are processed in public cloud by efficiently allocating the computing power [12]. When the sensors are dispersed over a many geographical boundary and uses multiple cloud provides will have interoperability problems [13]. Additionally, at the finish of 2006, aggregate of vehicle rental organizations has more than six thousand around the globe and in the year 2013, insights appeared that just

about 2 million vehicles were lease in United States (Yang, Jin, and Hao, 2009)[1].Currently leasing administrations are given dependent on manual work, which incorporates a great deal of time and assets required is likewise expanded in light of the fact that each procedure requires extraordinary assets. Numerous associations used web-based system that can be coordinated with SMS innovation on the grounds that the vast majority regularly utilized cell phone that offers comfort to the clients who are acquainted with SMS innovation. The innovation has been executed into the wide-run diverse parts, for example, instruction (Song and Fox, 2005[2]; Vera and Comendador, 2016[3]; Verma and Gupta, 2013[4]), wellbeing organization(Gurol-Urganci, de Jongh, Vodopivec-Jamsek, Atun, and Car, 2013[5]; Wang and Andoh- Baidoo, 2017[6]), government (Onashoga, Ogunjobi, Ibharalu, and Lawal, 2016[7]; RoshanTharangga et al., 2013[8]) and private sectors(Ghoreishi and Shajari, 2010[9]). The prior examinations demonstrated that Management Information System (MIS) could be utilized to oversee vehicle rental, expected to quicken the procedures and administrations to clients (Busse et al., 2017[10]; Li, 2013[11]). In the interim, the utilized of the online framework turn into a well-known pattern because of the administrations can be gotten to remotely by utilizing internet browser and can be available from anyplace on the planet. Plus, a cell phone is a basic medium to convey, communicate or gadget to pick up learning. This research paper demonstrates the effective utilization of rental car system that can be easily accessed in the remote areas and also add benefits to both customers and car owners. This paper includes section II demonstrates the methodology, section III illustrates the experimental results and finally section IV concludes with the conclusion.

II. METHODOLOGY

Smart renting of vehicles system is used for developing GPS-based content alert for car rental system is to make the car available for every common man with a minimum cost and effective use of time, which is beneficial to the car rental agencies and customers. Therefore, this IoT based application helps the customers to be comfortable and to have the privacy ride as travelling became the part of life. Travelling through cabs or any rental vehicles has become quite common in these days. Unfortunately this system is confined to cities and towns. So, many of the rural people and the colleges which are situated in the remote areas are the major concern. To address this issue our application aids to provide a rental car system with GPS –GSM mode. The working of this smart renting of vehicles is illustrated through following steps.

Step 1: Initially the car with GPS –GSM mode should get registered by the owner into this application through giving the basic details like name, address, car number and its working condition, Car available timings that can be updated periodically.

Step 2: User must register into this application by giving his/her primary details. Once after completion of the registration he/she is provided with the credentials that help in the process of hiring a cab.

Step 3: Once the unique credentials are provided for both customers and car owners, they can easily access the application.

Step 4: Car owner can make his/her car available for the customer when the car is free.

Step 5: Customers can check for nearby cars and send the request to the respective car owner. If the car owner is interested and feels trust worthy about the customer then he/she assigns the car for the requested customer with reasonable price.

Step 6: If the owner feels the user/customer is a suspect or he/she are not hand over the car with in the given time then in such cases owner has a right to stop the car at any moment through his/her mobile.

Step 7: User is allowed to raise a request for the extra hours or any trouble faced by the car that can be easily resolved through this application by replacing the car.

Step 8: This car rental system is to make the car available for every common man with a minimum cost and effective use of time, which is beneficial to the car rental agencies and customers, simultaneously the car owner is also get benefited by getting profits through his/her car which is ideal for hours or years.

A. Benefits of this application

1. Simple Vehicle Maintenance

IoT shrewd sensor system will enable us to quantify every one of the accreditations identified with the automobile support. This can be count weary fuel sign, gaseous tension, track the vehicle area increasingly so on and so forth. This information is collected and placed in the cloud .All the information about the vehicle or automobile can be publicized in a web application having an appealing user interaction which is everything but hard to utilize.

The automobile/vehicle upkeep similarly incorporates pickup and drop off which can be effectively checked and controlled by means of the IoT empowered the web application. Car IoT arrangements give high adaptability. Subsequently, we can include the same number of accomplices as we need to the system. These accomplices can enable you to streamline the procedure of vehicle support and enable you to accomplish increasingly critical grounds.

2. Decreased Operational Cost

Car IoT arrangements can enable you to decrease your operational expense by diminishing the quantity of workers. Since the entire procedure is getting robotized the time and exertion required in information handling will be decreased. Presently, you needn't bother with representatives to remove the data from monstrous informational collections.

3. Improved Order Processing

Routinely vehicle rental request preparing may take additional time and

exertion, yet with car IoT arrangements, it will get diminished. It streamlines the procedure of conveyance and gathering of vehicles. Gathering client data and assigning the client data to the automobile or vehicle. Provide the services to the client and acquire money from the clients and making them fill criticism shapes physically can be repetitive. This is influencing the client experience.

4. Customer Service

Car IoT arrangements help you to not just associate the rental vehicle to the Internet, yet it additionally interfaces the various things which a vacationer may search for. Presently, the client won't require a genuine physical key to open the vehicle. Their cell phones can be the way to the vehicle. Client's cell phone will consequently get matched to the vehicle. When it is combined, clients can do things like making calls while driving, play their most loved music station, pay for gas, and explore themselves to inns and visitor places lastly pay for the whole administration utilizing a solitary application. By making this application gives the users a end to end connectivity arrangement. A solitary application which can do every one of the assignments a client wishes to do while they're on the excursion. Your application will be the source and end of everything that client needs.

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III. EXPERIMENTAL RESULTS

IoT based application helps the customers to be comfortable and to have the privacy ride as travelling became the part of life. Travelling through cabs or any rental vehicles has become quite common in these days. Unfortunately, this system is confined to cities and towns. So, many of the rural people and the colleges which are situated in the remote areas are the major concern. To address this issue our application aids to provide a rental car system with GPS –GSM mode. Initially the owner/provider of the car should get registered and can access the application with his credentials depicted in Fig 1. Customer can also acquire the credentials by registering into the application and raise a request for a car by observing the car details illustrated in Fig2. Fig 3 describes the car specifications like model number and its present condition. This application tracks the all the user and providers details illustrated in Fig 4. Finally all the requests raised and responses are been listed in the Fig 5.

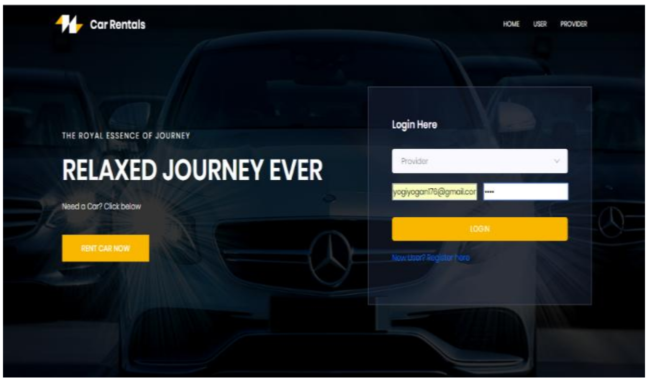

Fig.1 Car provider login page

Fig.2 List of the available cars details

mysql> select * from addcar;

id	uname	carname	model	location	typeofcar	description	strtdtm	enddtm	status
1	cys30176@gmail.com	swift	maruti	syamala nagar,gunur	hatchback	sdafdsf	2018-11-17T00:05	2018-11-17T13:00	available
2	abhishikth.k291998@gmail.com	figo	ford	syamala nagar,gunur	hatchback	good condition	2018-11-18T15:00	2018-11-18T18:00	available
3	yogiyogan176@gmail.com	vento	volkswagen	k l university, vijayawada	sedan	good mileage	2018-11-18T17:24	2018-11-24T14:45	available

3 rows in set (0.04 sec)

Fig.3 Description of the available cars

mysql> select * from reg;

uname	pwd	emailid	loc	phno	gender	role
abhi	1234	abhishikth.k291998@gmail.com	guntur	9052525656	male	provider
abhii	1234	abhishikth_k29@yahoo.co.in	guntur	9052525656	male	user
sai	123	cys30176@gmail.com	guntur	7207273742	male	provider
nithish	123	nithishyarramasu@gmail.com	guntur	7207273742	male	user
yogi	1234	yogiyogan176@gmail.com	vijayawada	7207273741	male	provider

5 rows in set (0.24 sec)

Fig.4 List of the existing users.

mysql> select * from reqresp;

id	uname	toname	carname	model	location	typeofcar	description	strtdtm	enddtm	status
1	cys30176@gmail.com	abhishikth_k29@yahoo.co.in	cys30176@gmail.com	swift	maruti	syamala nagar,gunur	hatchback	sdafdsf	2018-11-17T00:05	approved
2	yogiyogan176@gmail.com	abhishikth_k29@yahoo.co.in	yogiyogan176@gmail.com	vento	volkswagen	k l university, vijayawada	sedan	good mileage	2018-11-18T17:24	approved

2 rows in set (0.00 sec)

Fig.5 Request and Responses made by owners and customers

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IV. CONCLUSION

This paper has displayed some insight on user technology to develop and coordinating the online web-based application with GSM-GPS innovation to upgrade the service given by the vehicle rental organizations. The application helped the specialists to inform the clients through SMS by sending a dependable message to alarm the clients about the booking status, and the accessibility of the car held. Hence, the application gives a convenience method for notifying the user using cell phone, which is a typical individual communication method for a great many people. Moreover, this application makes it simple to get vehicle data, book a vehicle and rapidly lease a vehicle and location of the vehicle also can be tracked using GPS mode. This application aids to keep the vehicle safe mode by turning off the engine using the provider mobile if he finds the user is suspect. Therefore, this IoT based application helps the customers to be comfortable and to have the privacy ride.

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