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Web Technology based Waste Management System: A Real Time on Demand Collection of Waste

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Abstract: ***In the light of today's urban cities, waste disposal has become a major concern. Improper waste management results in unclean, foul and unhygienic conditions which give birth to numerous diseases in the region. It leads to spread variety of pathogens and leads to poor logistical and human resource management.The main reason is that in the busy working life schedule, people don't have enough time to dump their waste. Our idea is to build a web based application for proper waste management. Waste will be collected from the user's doorstep as per his/her request to avoid bad treatment/disposal of waste. There will be a real time monitoring of the dumper in order to provide accuracy, live status and no malpractices. The scheduling of stoppage and collection of waste is regulated by the admin and directly transferred to the dumper driver through the web application. The admin ensures route optimization to save time. There will be a personal software at the admin side so that there will be no interference of any other untrusted party. This is a real time initiative to promote the safe waste disposal in the busy life schedule.***

Keywords: Web based application, Waste Management System, Route Optimization , Real time monitoring

I. INTRODUCTION

One of the most challenging problems in Smart city project is solid waste management. About 30% of the total budget of a municipal corporation is consumed for waste management [1]. The municipal corporation has inadequate resources that result in improper waste management. With the implementation of smarter technology resources can be utilized properly with enhanced efficiency.

One of the most provocating problem in today's modern era is waste management. According to municipal corporation , 70- 85 % of total expenditure of waste management was spenton collection , 26.45% on transportation and only. 2.7% on disposal. The municipal corporation does not have optimal resources that out turn in improper waste management .Today contemporary world operate mostly on the web application which has become an indispensable constituent in our life, may it be podcasting , productivity, graphic design , optimization or in the case of waste management. A web application is application software that run on a web server , unlike computer based software programs that are run locally on operating system of the device . The thought of implementing and creating web application for the management of waste is notnew, rather simulation has been taken from previous research paper. So in this paper we have proposed a system in which the web application is created on both the ends that is user end and driver end . This application will remotely take the location of the user who has to dispose off his waste , ping the request to the driver and then driver will collect the waste from the userlocation and send him the confirmation message .



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II. RELATED WORK

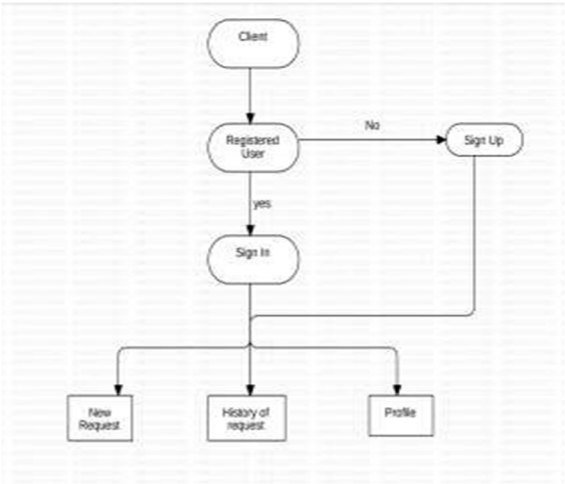
Waste management system has been proposed by various authors in their research works [1-4], these works propose the use of ultrasonic sensor modules to detect filled up waste bins. The authors in [5] propose an Arduino Mega for implementation of intelligent garbage collection using various technologies. The authors have given an extensive study in the context for Waste Management for Smart cities [6-7]. Web server as a technology for garbage management is suggested by authors in their research articles [8] for Smart cities. The author has commented on web as a service enabler for Smart Cities in IEEE Journal [9]. The author in has proposed a waste-bin monitoring using integrated technologies. Web based smart garbage and waste collection bin has been proposed in the research article [10].

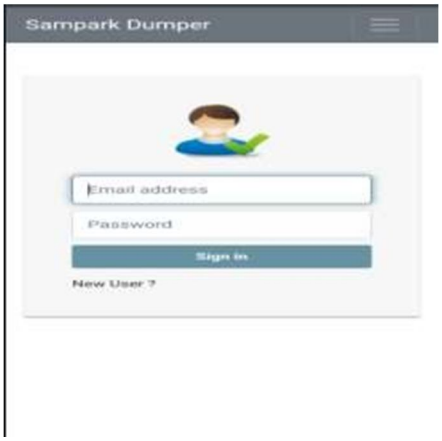
III. METHODOLOGY

In our proposed system, we have used a web-based application and a system software. The web-based application will work at the client site and at the driver site whereas the system software is used by the admin. The purpose of making the personal system software is to maintain the privacy of the data of admin by keeping in mind that no one will access it except the admin. The whole project is working on the live server and hence it requires the active internet connection at the client, driver and the admin site.

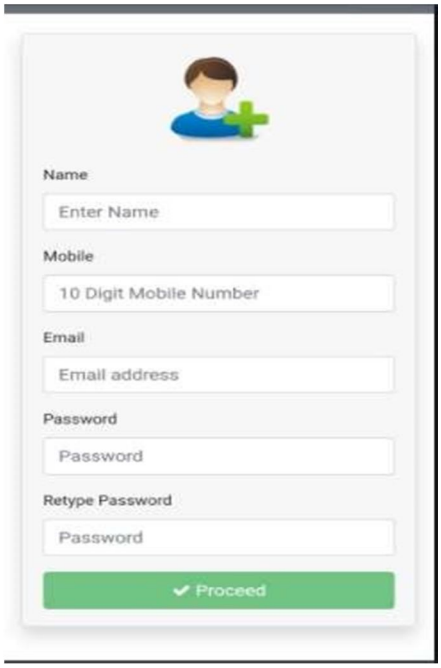
A. Client Side

The web-based application at the client site is used by the client to make a request to pick up his/her trash after building his profile over the app. The client is able to make a request for anybody from his account because the trash will be picked up after the client submit the location of the trash according to his convenience, he/she can decide the time and date for the trash pickup. The location is automatically submitted in the form of coordinates once the client turns on the GPS and client has to submit the address manually. Once the request has been made, the request is transferred to the driver and it also reflects over the admin software. Once the trash is picked up by the driver, both the driver or the client can notify admin that whether the task is completed or not. The client can timely change/update his/her information over the application.



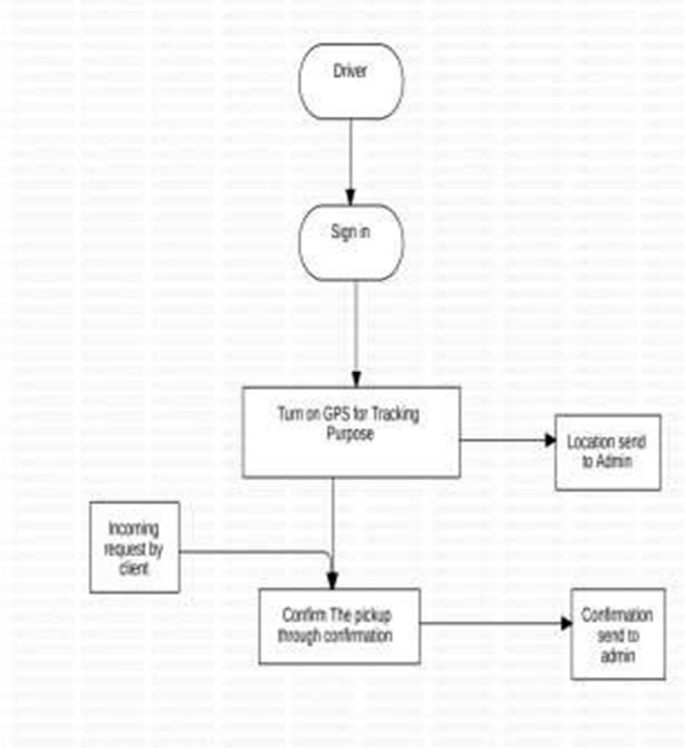


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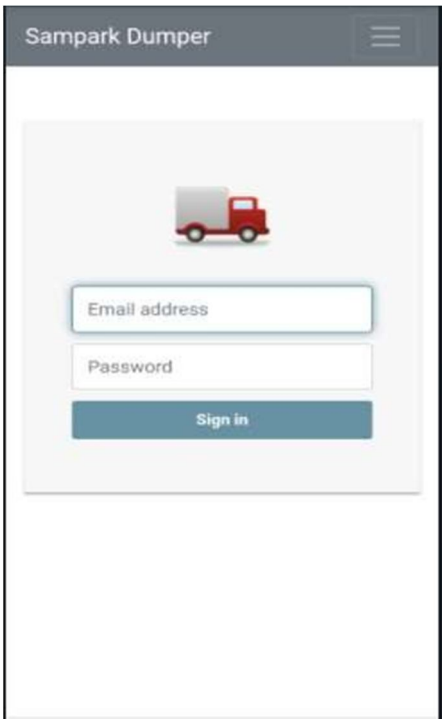


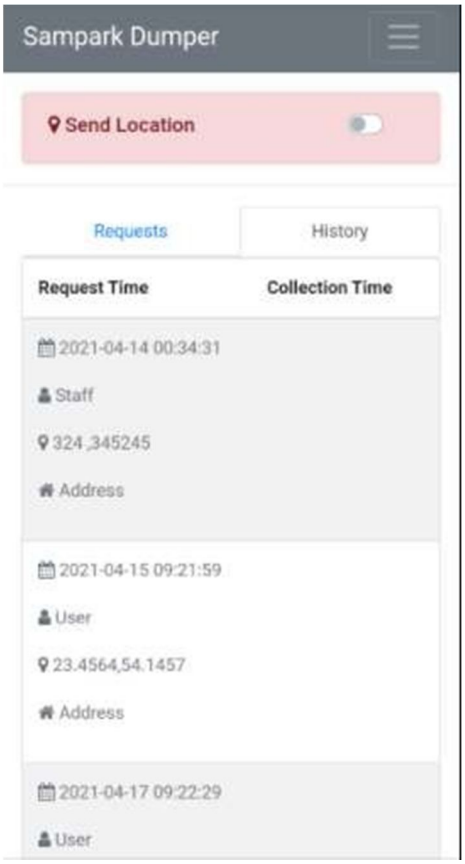
B. Driver Side

The web-based application at the driver site is as same as the client site. First of all, the driver has to make his profile over the app which shows that the driver is a registered driver of that particular authority and has theaccess to use that app. After that, the driver will be getting all the requests. Admin can also assign therequest to the drivers according to the location. The driver has to turn his location on and ensure that he has an active internet connection so that the admin can track him and there will be no chances of malpractices. Oncethe request is executed, the driver can acknowledge theadmin about the success of the task.



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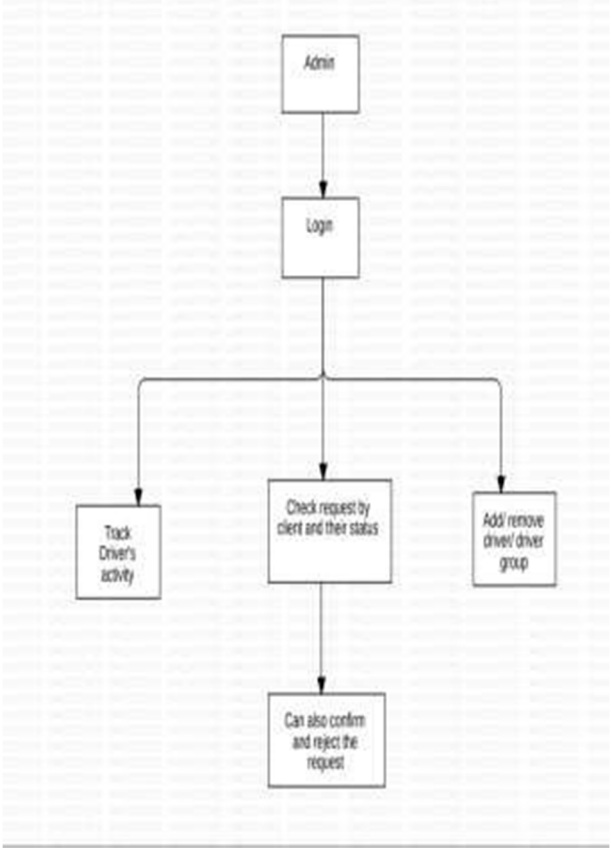


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C. Admin Side

The personal system software will run over the admin site. To maintain the privacy the personal software has been made which is restricted to only admin's system. The active internet connection is required by the adminin order to track the driver. The admin can see the execution report of the trash that whether the trash is picked up or not and also see that whether client has given the feedback or the driver. The admin can add or delete the driver from a particular group and can edit the group and group members also. The admin can also seethe location from where the trash request has beengenerated.

The set of web-based application and a personal software will help a lot to manage the waste properly and also help to solve a real time problem. User can pickup his/her waste according to his convenience.





This project is based upon the Waterfall model and for web application we used HTML, Angular JS and PHP and for the personal software we have used C#. The project is totally online (runs on live server) and the database is also saved on the server.

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IV. CONCLUSION AND FUTURE SCOPE

The above proposed waste management system would solve various scenario specific issues in modern cities when it comes to waste collection and disposal to ensure better community hygiene. In future, the waste recycling industries can directlycollab with the admin so that the waste truck instead of going into the dump yard move directly towards the particular industry which reduces the middle costand also contributing in the recycle and reuse ofwaste. If needed then enhanced app can be made through which the client can also track how close thedriver has reached to his/her destination.

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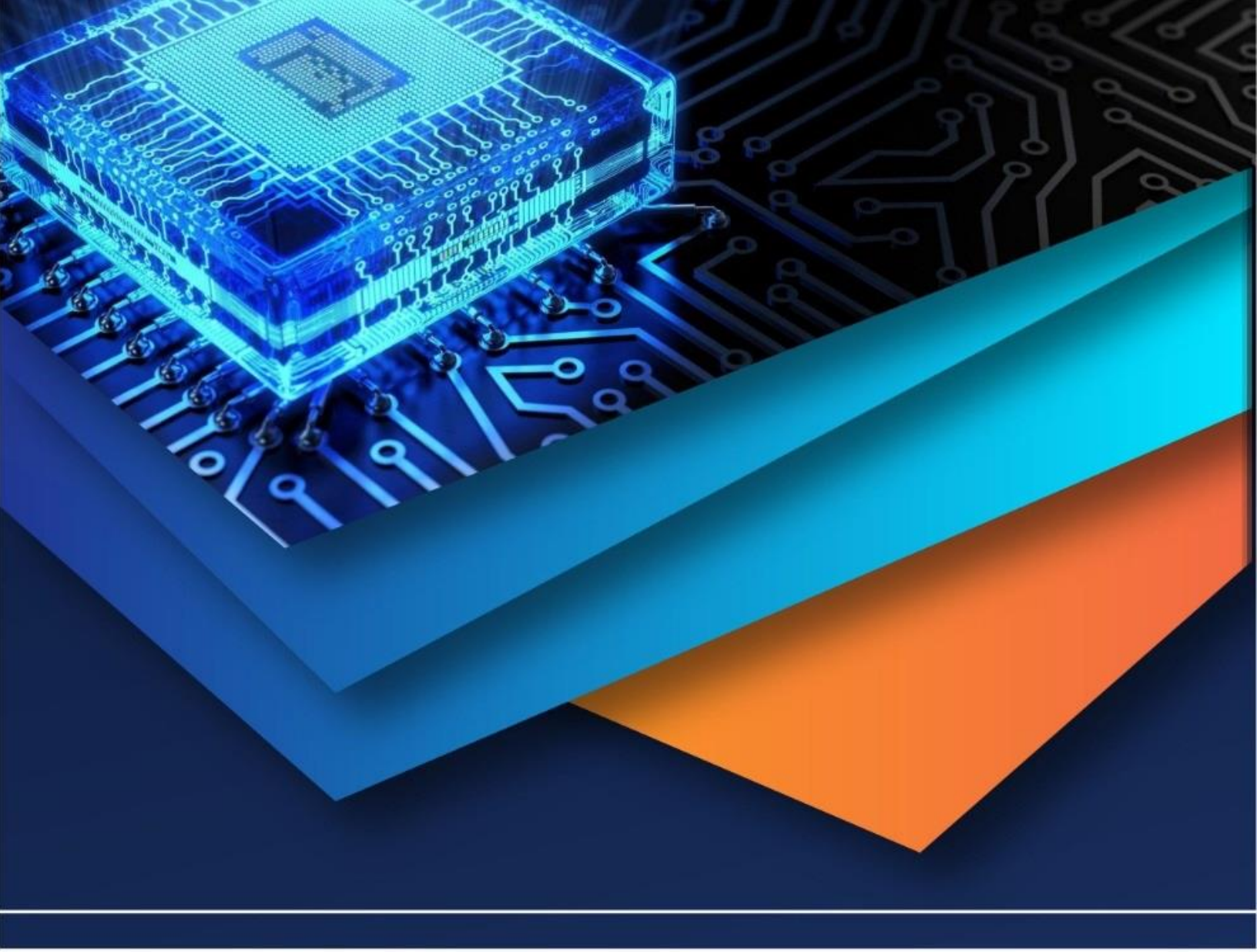
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