Web Application Supporting Vehicle Toll Payment System Using NFC Technique

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Abstract: The outline and execution of a web application supporting vehicle toll installment framework utilizing IoT gadget is introduced and portrayed. The idea of vehicle toll installment over an online installment framework is additionally portrayed. Handling, checking and controlling the web use of such instalments utilizing IoT gadgets are portrayed and exhibited.

Keywords: Web Application Design, IoT Device, Vehicle Toll Payment, NFC Card.

I. INTRODUCTION

The use of WEB applications in the business environment The utilization of WEB applications in the business condition has turned into the standard. WEB situated applications are accessible over the Internet for use in any area and on any sort of little or asset compelled gadget. Such web applications can be incorporated with various different applications, control and administration administrations, and different applications also, to acknowledge administration, observing revealing, and so forth. In the event of a web application, security is on an abnormal state in view of the entrance to a solitary focal server, instead of utilizing a lot of workstations. The data contained in the database is utilized to make the report about number of vehicles and classes of vehicles that go through the toll

II. LITERATURE SURVEY

In Japan, NFC labels are in incorporated with card prevalently named as Felica card which are utilized to particularly distinguish individuals. In [1] paper the creators endeavoured to make an Attendance administration framework in light of NFC character cards which when swiped on relating PDA or tab (having Android application) will include participation into the participation record show onto the cloud framework. Promote these participation records can be seen and broke down by experts whenever and anyplace.

In [2] paper the proposed system initially acknowledges vehicles those are passing toll court and if veritable at that point charges electronically the records or the entirety in the IC card of the selected vehicles without meddling with them. Creators endeavoured to create framework having highlights like programmed challan and detailing strategies to enlisted proprietor of the vehicles.

III. CONCEPT OF WEB APPLICATION

We propose a concept, design and implementation of a cloud based web application used for vehicle toll payment. the web application realizes the user (driver) desired toll payment over an electronic payment system. The centerpiece of the system is a multilayer Web application that performs basic operations, management and administration of the IoT based toll payment system. The application and the central database are located on dedicated virtual servers with the use of HTTPS security protocol for communication and accessing purposes. The IoT device itself can be integrated into a vehicle which has the embedded application integrated in the vehicle's main navigation board, or represent a mobile device with a mobile application for vehicle toll payment. The IoT embedded application was developed using Java programming language.

IV. PROCEDURE

In framework NFC is utilized for capacity of the data of the client and every client has an individual NFC ID. For this the client ought to contain the NFC versatile and enlistment ought to be done on the web. Enrollment incorporates First Recharge process that achievement making of secured prepaid record in the database. After enlistment there is no need of web association for the client portable at the toll region yet in the event that the client needs to be refresh as per his record as of in database then he will require the web association this might be named as "Synchronization" (Sync-Account). At toll stations the client can utilize his NFC empowered telephone just by tapping his telephone on the toll's NFC gadget which might be advanced cell or tab. On tapping of client's telephone with an opened App, the NFC correspondence station is set-up. What's more, clients NFC-id put away in application's neighbourhood DB is exchanged to toll gadget. After that the toll gadget changes over the client's NFC-id to http ask for by including toll-id and current figured reasonable and forward this demand to the server. The server stores, checks the information into the database and process further to finish the exchange. On fruitful confirmation the asked for reasonable is charged from the client's prepaid record and time-stamp of the finished exchange is put away and sent as affirmation to the toll gadget. At that point toll gadget store and sends this data to the client by means of NFC affirmation before conclusion of correspondence channel, and afterward the client continues. The toll station are paid month to month based on contract and month to month work-out premise

i.e. fundamentally the aggregate sum gathered by that specific toll in settle period or a month.

V. SYSTEM ARCHITECTURE

The block diagram mainly consists of four components those are user NFC device, Toll NFC device, Server and presented web Application. The web application is hosted for purpose so that initially user can register his details and make android app available in his device may be tab or smart-phone which supports NFC communication protocols. During the registration process, client/user will be provided with the NFC-Id that will be unique as per user's filled details. The whole required details will be saved into user's respective account database (Server). The web Application can be serviced from PC Desktop, tab, smart-phones. The Server then validates and process the request further while making usage of information stored in database. Toll NFC device is a bridge that fills up the communication gap between user's NFC device and the server. The toll NFC device accepts the request from user which is invoked on tap/contact of these two devices. The request is then dispatched from toll device for server for requested payment processing. All the transaction history is maintained in user's account. The Server returns an acknowledgement which is the response of the processing. The acknowledgement is saved and send to both toll and user device. On connection establishment of server with user NFC smart device, local Database of NFC Android Application get synchronized with the account present in the server database.
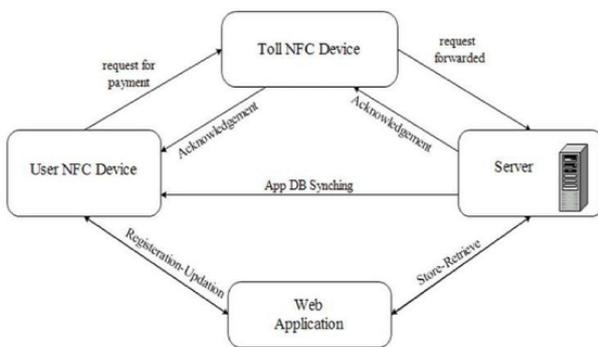
Hence with these the user App account is always updated.

Fig 1.   System Architecture diagram

VI. SYSTEM REQUIREMENTS

Due to this architecture design there will be an idea about the software contents used in this system. The first block represents Android OS which contain NFC App users and toll station. The second block is of web application which contains all web containers for user interfacing like html, jsp files. The last block represents Windows OS used which contains server and database. Server has java, .class, web.xml, lib, .jar files which is logical and back end tier of client server model and web app.

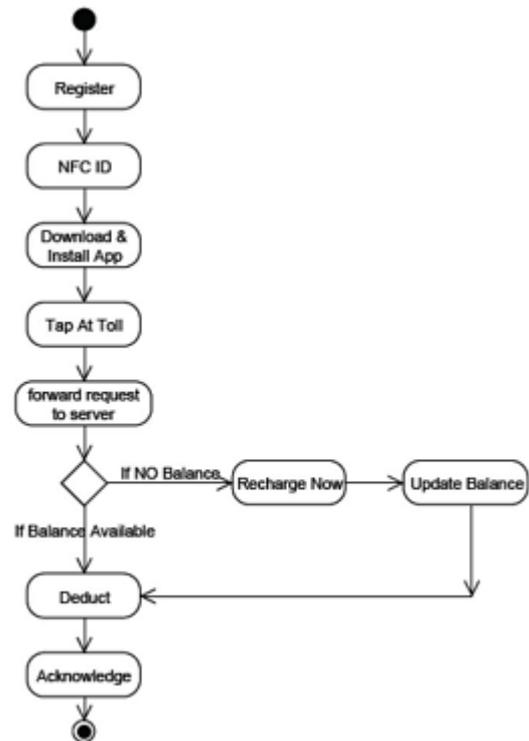The activities done by each task is shown in below flowchart.

Fig 2.   Flow chart of System

VII. ADVANTAGES

i)   Vehicle documents can be checked in once.

ii) Standardizations and transparency at Toll fair collection and its utilization.

iii) Security is enhanced as both the centralized server and toll device knows who is crossing the toll.

iv) Need for manual toll based system is completely reduced.

VIII. CONCLUSION

Web Application Supporting Vehicle Toll Payment System answers to the necessities of current issue that we are going up against. This approach opens multiple possibilities because additional benefits in systems with toll can be introduced. In this paper, a design scheme was put forward which is low cost, high security, far communication and efficiency etc. It not improves passage ability of expressway but also improves the technology level of charge. Web Application Supporting Vehicle Toll Payment System is an effective measure to reduce the proposed Electronic Toll collection (ETC) system, real time toll collection and anti-theft solution system have been designed. This reduces manual labour and delays that often occur on roads.

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