E-Payment for Toll-Gate Processing using QR Technology

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ABSTRACT

Time and efficiency are a matter of priority of the now day. A Huge problem for Motorists to pass the toll-gate on the time of vehicle stoppage. To overcome the major issues of vehicle congestion and time loss RFID technology is used in the present system. RFID (Radio Frequency Identification) technologies utilizing radio waves to automatically identifying involves applying RFID tags. To manage payment service with RFID technology. The advanced system designs to replace the RFID technology using QR (Quick Response) code technology. Using QR code technology based on Tollgate E-payment processing is done thereby if can avoid too much standing time in the toll gate processing. The transaction must be processed before itself by the respective owners who own the lorry/cab/van/or any such vehicles thereby the persons who ride the concerned vehicle can no need to wait and pay in tollgate. On the travel time must want to consider for each toll-gate to identify the individual unique code from such a distance. Based on the unique code, payment will be done, after the banking transaction was done by the owners using the unique code, the toll gate will have the submission of us thereby the toll gate will systematically allow us by providing the QR code thereby the passers will show the mobile confirmation/V-card. If not they will stop the E-payment and follow the normal procedural methodology.

KEY WORDS: RFID, QR Code, Unique Code, E-payment.

1. INTRODUCTION

A user- friendly and convenient mobile E-payment solution is using QR technology. In present day many of country use RFID (Radio Frequency Identification) technology for toll-gate payment. The RFID tag insert on the vehicles it must visual to read the data from the user or vehicles or payment information using RFID readers. RFID technologies utilizing radio waves to automatically identifying involves applying RFID tags. To manage payment service with RFID technology. To use RFID technologies have more drawbacks. RFID systems can be easily disrupted, RFID Tag Collision, Security privacy, Low cost, Ethics Problems with RFID. To use of RFID technology to faced problems by passengers in many cities. To make RFID as automatic toll tax payment system and the amount transaction. This makes tollgate transaction more convenient for the public/private use. RFID is evolving as a major technology enabler for identifying and tracking goods and assets around the world. An ATC (Automated Toll Collection) system commonly utilizes radio-frequency identification (RFID) technology. RFID system consists of a transponder for reader/writer about the data of vehicles.

So we suggested the QR technology use "E-Payment for Toll-Gate Processing". A recent trend among small businesses is the growing use of QR (Quick Response) codes. QR codes can be scanned and read by a camera-equipped Smartphone. QR code on an item scans it with your Smartphone and immediately has access to a lot of information electronically. QR Code on a business card might contain a V-card (digital business card) that you can save without having to manually input the card on user information. E-payment by doing this pre-banking Tollgate transaction processing the drivers will have QR code as a proof in the mobile phone or V-card to move to the concern location without any waiting time in tollgates. To use QR technology have many advantages they are, Very obvious, Easier and cheaper to get QR codes out here, RFID requires specialized equipment, QR codes are web oriented and more flexible and Securable.

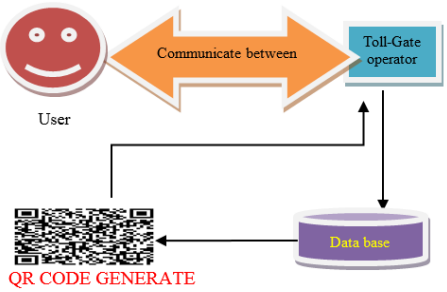

Figure.1. Architecture of Proposed System

A user wants mobile (Smartphone) application for E-payment on toll-gate. For every toll-gate has unique code for identification and also for payment processing, so a user must to know the unique code (unique code are visuals using some road side advertisement) for payable toll-gate. Users communicate between the toll-gate operator with the help of web and mobile application. To do the payment process between the toll-gate operators, they send and store data's to the database, then the database generate the QR code and it send to the toll-gate operator and the toll-gate operator pass the QR code to user. The user after receive the QR code the payment process is completed,

when a users cross the toll-gate user must to show the QR code in to the QR code reader. After read the QR code the gate open and easily cross the toll-gate without any time delay.

2. MATERIALS AND METHODS

Related Works: The toll-gate collection is the one of the source for the Government and maintenance of Road. In the tax payment system will be an advantage for the government and this system will be monitoring the vehicles which are crossing the gates to pay some money as depend on vehicles. On this system works as manually that happens traffic jam. So overcome the problem presently use RFID technology for payment processing in toll-gate.

In use of RFID tag on vehicles' for read the data using RFID tag reader. To have some disadvantage on use RFID technology they are, RFID systems can be easily disrupted, RFID Tag Collision, Security privacy, much cost, Ethics Problems with RFID, various size of RFID tag are used to difficulty and also damage easily. This method works as useful high level transport agency, otherwise normal motorists are not used the RFID technology.

So we recommend using QR technology replace the RFID technology. QR code has easily read and writes the data with high secure. It communicates between users and toll-gate operators. We use two types of application web application for pc and mobile application. To make E- payment for toll-gate using unique code for every toll-gate has specific number to identification. If you pay the money automatically generate the QR code on our mobile, to use the QR code for crossing the toll-gate without delay. The QR code reads by QR code reader, it makes digitally scanned the user data.

Proposed Methods: A recent trend among small businesses is the growing use of QR (Quick Response) codes. QR codes can be scanned and read by a camera-equipped Smartphone. QR code on an item scans it with your Smartphone and immediately has access to a lot of information electronically. QR Code on a business card might contain a V-card (digital business card) that you can save without having to manually input the card on user information. E-payment by doing this pre-banking Tollgate transaction processing the drivers will have QR code as a proof in the mobile phone or V-card to move to the concern location without any waiting time in tollgates. To use two type of application for E-payment web application (PC) and Android application (Smartphone) finish the payment processing automatically QR code generate on giving a mobile number. After generating the QR code our payment is completed and when reaches the toll-gate to show the QR code in front of the QR code reader (it scanned our data as digitally) and leave from the toll-gate without waiting time.

Proposed Algorithm:

Reed–Solomon error correction algorithm: Reed–Solomon codes are a group of error-correcting codes. Reed–Solomon coding is very widely used in mass storage systems to correct the burst errors associated with media defects. This code can correct up to 2 byte errors per 32-byte block. Reed–Solomon coding is less common in one-dimensional bar codes, but issued by the Post Bar symbology.

Notation: $[n, k, n - k + 1]_q$-code

Decoding: Berlekamp–Massey Euclidean et al.

generator polynomial

$$g(x)=1\cdot x^5+1f\cdot x^4+c6\cdot x^3+3f\cdot x^2+93\cdot x+74$$ equation

$$\{1,\ 1f,\ c6,\ 3f,\ 93,\ 74\}$$ list object

3. RESULTS AND DISCUSSION

The module of E-payment for Toll-Gate Processing Using QR Technology system designed of the vehicles and performed the billing in accordance to the identity of each vehicle as pre-recorded in the database. The system is automatically open the gate as well to show the QR code on scanner. These were the major achievements met in the project, among other objectives also achieved, which include QR technology for E-payment process and remote database connection for QR code generator.

Fig.3a. Before enter the toll gate to make E-payment

Fig.3b. E-payment makes use with the mobile application

Fig.3c. Toll-gate operator analysis the payment and send data to data base

Fig.3d. After finish the payment process user receive QR code confirmation

4. CONCLUSION

The E-Payment for Toll-Gate processing using QR technology of toll-gate can have the best solution over money loss at toll-gate by reducing the manpower required for collection of money and also to reduce the traffic indirectly resulting in reduction of time at the toll-gate. QR technique will include the QR code reader, the finishing of E-payment on toll-gate process users receives the QR code confirmation. The QR code technology has high securable and low amount of spend cost and easy steps to pay.

Conflict of interest: The author declares having no competing interests.

5. ACKNOWLEDGEMENT

The author wish to thank Vel Shree Dr. R. Rangarajan, Chancellor, Vel Tech High Tech Dr. RR and Dr. SR Engineering College, for the support and facilities provided for the preparation of this paper.

Financial disclosure: No financial support was received for this implementation.

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