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Разработка экономичной системы автоматического сбора пошлины в Бангладеш

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Аннотация
Наряду с социально-экономическим развитием Бангладеш сильно меняется и инфраструктура. Чтобы удовлетворить спрос, были использованы новые технологии. Электронная система взимания платы за платные дороги, платные мосты, платные туннели и т. д. в Бангладеш является одной из них. В данной статье описаны система электронного сбора платы, ее возможности и проблемы в Южной Азии. Основное внимание уделяется развитию рентабельной системы электронного взимания платы в Бангладеш.
Ключевые слова: Система автоматического сбора пошлины, мост Падма, развитие инфраструктуры Бангладеш, платные мосты, платные дороги

Development of a cost-effective e-tolling system in Bangladesh

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Abstract
Along with the socio-economic development of Bangladesh, the infrastructure is also changing in a great way. New technologies have been used to cope up with the demand. An E-tolling system for toll roads, toll bridges, toll tunnels, etc. in Bangladesh, is one of the latest enhancements introduced for the betterment of the people. In this article, the e-tolling system, its opportunities, and challenges in South Asia have been outlined. The principal focus is on the development of a cost-effective e-tolling system in Bangladesh.
Keywords: Electronic toll collection, Padma Bridge, Bangladesh infrastructure development, toll bridges, toll roads

Introduction

In South Asia, especially in Bangladesh, the implementation of modern technologies and their demand increased at a higher pace recently. To cope up with the young, and working-age population of these countries there is no other choice but to digitize everything possible with the limited amount of resources and tight budget. Not long ago, the road authorities introduced automatic toll collection at three major bridges - the Meghna, Gomoti, and Bhairob bridges [1]. There is a plan for Bangladeshi transport and communication-related authorities to bring the whole country under e-tolling collection systems which hopefully will ease the long queues and waste of time.

E-tolling System

Electronic or E-toll connection systems are used with the aim of computerized fee collection from the vehicles for using tolled roads, bridges, tunnels, etc. E-tolling is a wireless system.
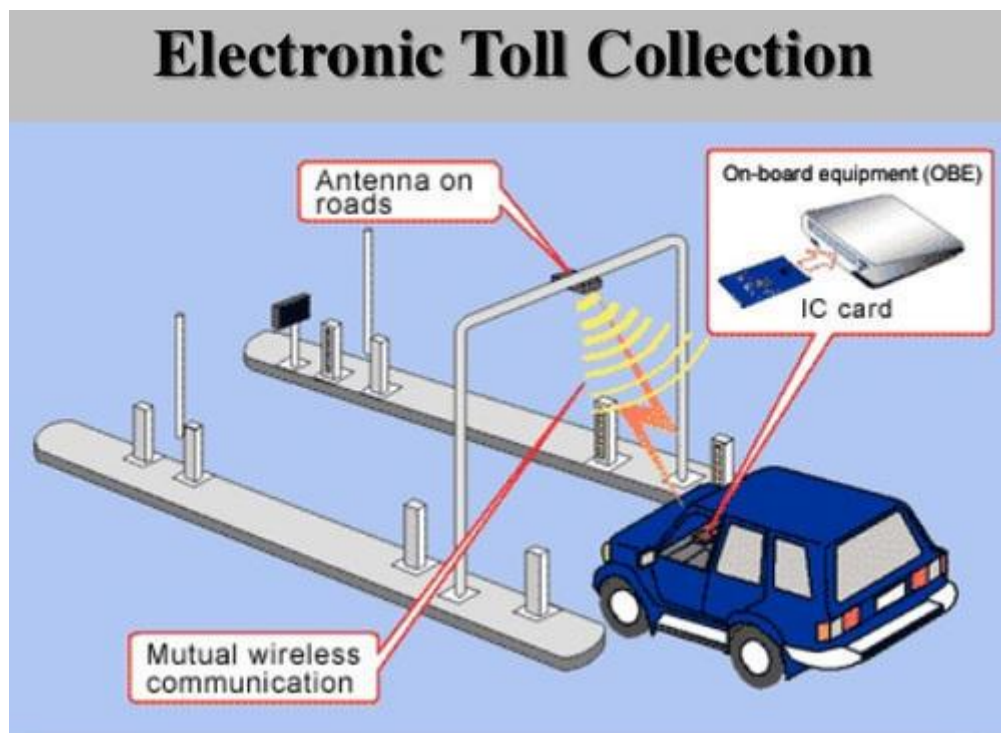

Figure 1 - An example of an Electronic Toll collection system [2]

E-tolling system in South Asia

Traffic jam is a very common term for the people of South Asia. Many cities of this area are in the top position in terms of facing traffic tie-ups. Both Bangladesh and India have cities which are led the list for a few years. In India, the system was initially set up as a pilot project in 2014 on the stretch of the Golden Quadrilateral between Ahmedabad and Mumbai [3, 4]. Then in many places including Chennai, Bangalore. More than two hundred National Highways across India were covered within 2016. In January 2021 electronic toll collection system (FASTag) was made mandatory at every toll plaza in India [5].

In Sri Lanka, Pakistan, and Bangladesh the 3-tolling collection system is yet to get its popularity and mass use.

There are some opportunities of the e-tolling system discussed below to understand the necessity and importance of introducing it in South Asia:

- The electronic toll collection system is an automatic process that's why it saves time;
- It is a wireless system, which makes it hassle-free;
- In terms of the e-toll collection system there is no need to stop the vehicles which reduce the large queues;
- Reduces the congestions of vehicles near the toll plaza;
- It works in the favor of a precise and transparent paying system.

Though the e-tolling system shows great potential for the enhancement of an intelligent transportation system for smart cities, still it shares some challenges too. Facts such as slow connection or cyberattacks should be kept in mind while implementing it in any region.

The Framework of E-tolling System

There are many methods available for the development of e-tolling. A cloud-based electronic toll collection system is one of them. The cloud platform allows easy and efficient communication between the ETC and the highway users by providing the facility to view the history of transactions performed with real-time notification options. One of the major advantages of the cloud platform is its ability to offer on-demand self-service. It also provides a location-independent resource pool [6].
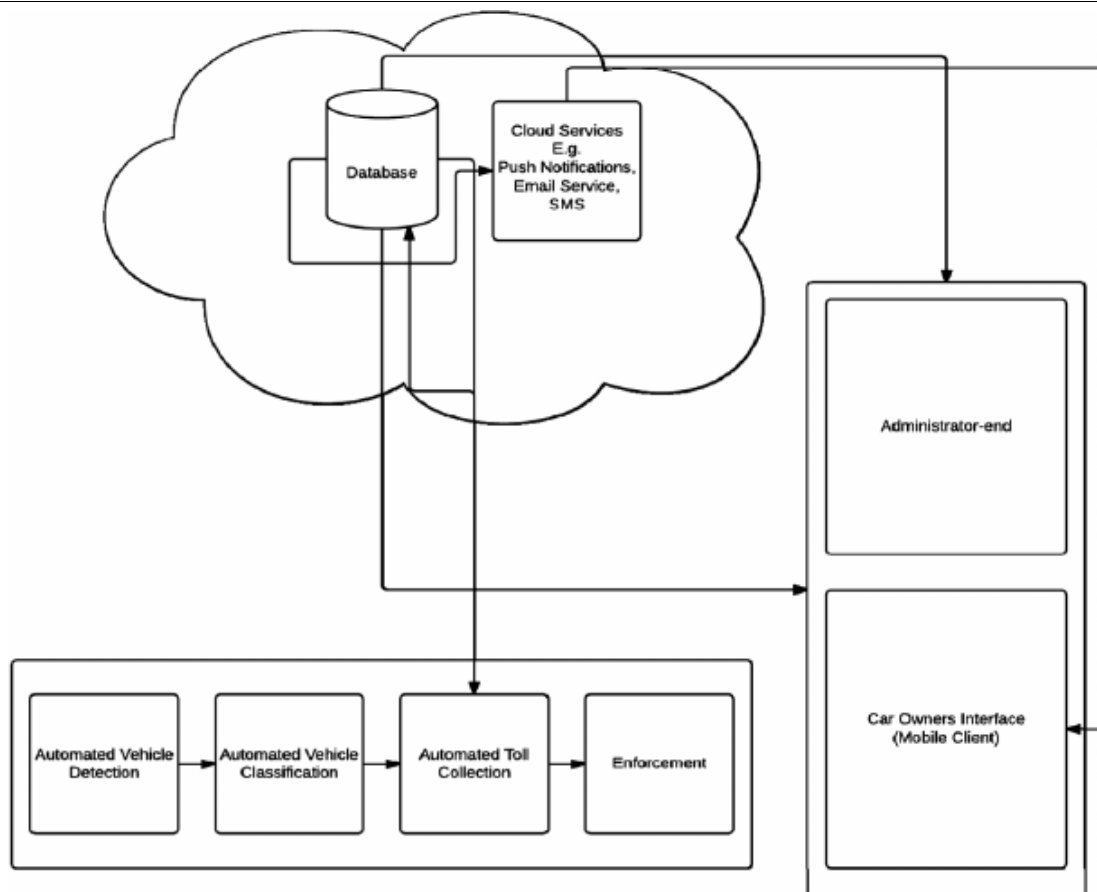
Figure 2 – Cloud-based Electronic Toll collection system architecture [6]

Methodology

For the development of a cost-effective E-tolling system in Bangladesh, three major steps will be maintained. First, it is necessary to implement a similar cloud-based e-tolling system in a small area, then it is essential to check the effectiveness and point out all the advantages, and disadvantages. Finally, it is required to focus on the improvement of the existing system depending on the cost-effectiveness and higher performance.

E-tolling system in Bangladesh

The Roads and Highways Department (RHD) of Bangladesh has a total length of 20,948 Km road under its control. RHD also controls a total number of 4,659 bridges and 6,122 culverts. RHD is currently operating about 161 ferry boats in 81 crossings (13 on national highways, 11 on regional highways, and 57 on feeder roads) on its road network throughout the country. As of January 2010, the Local Government Engineering Department (LGED) has so far constructed a total of 133,514 km (64,691 km dirt road and 68,823 km paved roads) Upazila and union roads and 971,498 bridges/culverts [7]. Recently the number of expressways, bridges, and highways increased at a rapid speed. Most of these roads and bridges are collecting tolls for future management and paying the loan from different organizations. To make the tolling system hassle-free like India, Bangladesh also

introduced an electronic tolling system for some bridges. But many highways and bridges still remain in a manual way.

Further Work

For this article, the focus was mainly on the understanding of the electronic toll collection system, and its possibility in Bangladesh. The development of a cost-effective e-tolling system for Bangladesh is truly a long way to go. For the continuation of the further work, the goal will be to maintain the recent work and implement a cloud-based e-tolling system in a smaller area within a few vehicles to understand or get an idea about how it may work in a larger region in the most cost-effective way.

Conclusion

Right Now, in Bangladesh, many mega-projects including the Padma Bridge for the development of infrastructure are going on. These projects will include all the modern technologies. The importance of the application of the E-tolling system for the reduction of the long queues, and sufferings for drivers is undoubted. The development of cost-effective e-tolling systems depends on more research connected to this field, awareness programs for drivers, transport-related surveys, understanding the advantages, and disadvantages, analysis of cost-effectivity, etc. Finally, it is possible to say that, to cope with the population and the demand of society, all south Asian countries need to understand the cost-effectiveness of any latest technology. Also, it's necessary to analyze the whole scenario before starting to implement that technology.

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