

Application of robotic process automation in customer satisfaction at toll plazas

Shefali Ahuja *

R. K. Tailor †

Department of Business Administration

School of Business and Commerce

Manipal University

Jaipur

Rajasthan

India

Abstract

Background: Digitalization is widely spreaded in all over the world and Robotic Process Automation is one the main component in future technology. It is a new technique which is used to copy actions of human being who is interacting with the digital system. Now a days RPA is being adopted by number of service providers, toll plazas are one of them. Operations at toll plazas are conducting through RPA in form of fastag. **Objectives:** The paper aims to analyses satisfaction level of customers at toll plazas. As increasing traffic creates a lot of difficulties faced by customers such as wastage of time in long ques, improper service at toll plazas, no response from the employees, lack of knowledge among toll plaza staff. To eliminate this kind of problem new technique is implemented as fastag. **Methodology:** This conceptual research was based on both the primary and the secondary data. The methodology which is used, is a way which includes systematic and effective evaluation of numerous factors which creates dissatisfaction among customers of toll plazas. **Findings:** With the help of adequate samples results and findings it has been observed by the researcher that after implementing Robotic Process Automation at toll plazas customers are being satisfied by the performance of toll plazas and their employees. **Conclusion:** Robotic Process Automation is becoming mandatory to do business operations at toll plazas, as bots can do multiple tasks within a very short span of time. As after introduce this technique to toll plazas quality of service is getting improved, customers are satisfied and getting 24*7 access to their systems.

Subject Classification: 55M30.

Keywords: Robotic process automation, Toll plaza, Critical evaluation, Fastag.

* E-mail: shefaliahuja22@gmail.com (Corresponding Author)

† E-mail: rajeshkumar.tailor@jaipur.manipal.edu

1. Introduction

What is robotic process automation?

Robotic process automation is a kind of technology which make work easy to do with the help of Robots. Robots are managed through softwares which mimic human actions and work as per need. Same as humans Robots can do anything like they follow instruction given by

Advantages of robotic process automation

- I. Reduction in cost: - as we all know that robotic process automation replaces humans with robots. Thus there is automatically reduction is cost of organization. Cost may be in any type like salary to employees, remuneration to workers, wages to employees etc.
- II. Quick Results of tasks: - Old method of doing work is now out of trend in order to gain maximum results one has to switch manual work to automation, that's why humans are now a days kept as second option in any organization, and robots are on top. Robots work more efficiently and effectively than humans. And the result came out much faster than humans. Any kind of long process can be easily shorten by Robotic Process Automation.
- III. Accuracy and quality: - when any organization adopt Robotic Process Automation the main thing they want is accuracy any best quality. Robots are designed by the professionals which are R.P.A. experts. Robots create by them are more accurate in their work. The always provide the best results with 100 % of accuracy and quality.
- IV. Minimum human interference: - in manual toll collection system toll tax was collected in cash, after implementing fastag there is no need to cash to be paid by the customer. Fastag eliminates cash with digital payment through account linked with it, along with it is reduces human interference.

Fastag

It is a new system which collect toll electronically. Fastag is operated by NHAI as shown in Figure 1. It is based on the system of RFID (Radio Frequency Identification) which allows automatic deduction of toll fee from customer's account which is linked with the bank. Fastag is positioned on the wind screen of vehicle, and necessary details collect by the scanner which automatically deduct amount without stopping the vehicle at toll



Figure 1

https://th-i.thgim.com/public/news/national/61urlp/article30041911.ece/alternates/FREE_730/FASTAG

plazas. After crossing the toll plaza passenger will get a message of amount deducted along with the details of toll plaza name, date and time. Fastag is mandatory for all vehicles from 19th December 2019. Fastag was introduced in 2014 as a pilot project on the stretch of the Golden Quadrilateral between Ahmedabad and Mumbai, and in July 2015 from Chennai to Bangalore.

Robotic process automation at toll booths

India is a developing nation which mainly uses the open system of collecting toll. Toll fees on any highways are decided by their length of stretch, which is usually near about 60 kilometers. If the length is less as per standards than toll collected according to the length. Toll fees varies from vehicle to vehicle. Toll is originated from the Greek word "Tax", Telos. Basically toll is an amount which is charged for using smooth roads. In India there are around 1000 toll plazas, and Tamil Nadu has largest amount of toll roads across the country.

Effect of applicability of robotic process automation on customer satisfaction

Systems for collecting tolls electronically (E.T.C.) were designed to increase traffic flow by speeding up toll transaction times. Three sorts of benefits of Robotic Process Automation (R.P.A.) can be broadly identified:-

- Benefit to toll agency:- the benefits of a toll agency includes fewer resources needed for operation, less physical labour, less maintenance and better charge accumulation.
- Benefits to users:- the user benefits includes a large amount of time savings, the removal of the hassle of demanding change and a reduction in unnecessary accelerations because cars don't want to be stopped for toll transactions. In addition, a sizable amount of gasoline and overall commute time are saved
- Benefits to society: - the reduced mobile emission that impacts the nearby where the Electronic Toll Collection (ETC) is located is one of the social benefits. In this study the user and the social advantage taken into account.

Better satisfaction and better quality is one of the main factor which comes first in every aspect of life. The user is relieved of the burden of manually collecting and paying toll fees. Customers have the option to pay for tolls at the toll booths since they setup accounts for Electronic Toll Collection (E.T.C.) use through cash, checks or even credit card stations. Users of Electronic Toll Collection don't have to stop their cars to pay tolls, which eventually saves time. Additionally, it has increased the general dependability of the trip time.

2. Statement of problem

Since fastag is implemented problem of paying cash is vanished. Still customers are facing a lot troubles while crossing toll plazas, such as wastage of time in long queues, improper service at toll plazas, no response from the employees, lack of knowledge among toll plazas staff, noise pollution in traffic congestion which creates stress and dissatisfaction among travelers. Hence R.P.A. has implemented to check the performance of toll plazas that weather customers are satisfied or not.

3. Review of literature

Shridevi soma (2019) expressed that toll was collected by the employees in cash, therefore it creates lots of traffic congestion, huge traffic and long waiting time at highways. This may lead to unwanted pollution at toll plazas. Thus to eliminate these type of problems a new system is installed which is based on the technique of RFID. This system is work on fastag from which amount deduct according to the distance travelled by

the traveler. If there is not sufficient balance in account one can recharge it from toll booth itself. This system assist in saving time in queues, reduce pollution and avoid traffic congestion at toll plazas.

Herry T Zuna (2015) concluded that basic fundament behind toll tax collection is growth and development of economy. According to them it provides stable connectivity among nations and provide more route of travel across the globe. Other than this toll tax roads should also provide better quality of road services and satisfaction for the travelers. Customers' expectations regarding better travel experience government should take essential developmental, as this type of sustainable development is the main component of customer satisfaction. Major two factors which affect the toll road experience are condition of roads and travel time. Article shows the quality of services, saving in time and amount of toll tax affect the consumers satisfaction.

Dini Dwi Wulandary (2022) expressed in his study that what the effect of E-WOM is and evaluate its value on customer satisfaction. For this study quantitative method is being used for the data collection by using survey technique. Researcher suggest to maintain a balance between service quality and satisfaction of customer. According to researchers advice the fee charge for toll should be as per the service provided by the toll.

Aamir Farooq (2021) in their survey revealed the comparison between automatic and manual system of collecting toll, and wastage of vehicles fuel while standing in queues at toll plazas. Study also shows the effect of toll collection system on toll road users and on environment. According to researcher electronic toll collection (ETC.) has removed so many barriers which was in the old method of collecting toll tax, but still there is a lot of work left and needed to be done. Hence as per this study customer need not to stop at tolls again and again to pay toll fee.

Akshaya N (2021) Concluded that fastag is kind of toll collection system which is a technological advancement for toll tax history. This system is based on the technique of RFID (Radio frequency identification device). It is tag which got fixed on the windscreen of car, when any vehicle passes through the toll plaza amount automatically deducted from the account. Fastag is easily available and can open by any bank. When the amount deduct customer will get a text message regarding toll tax. Fastag lower down the fuel consumption, eliminate paper work and also help in reducing air pollution. The main aim of this paper is to know the satisfaction level of customers after using fastag.

Sudheer Kumar Nagothu (2016) have focused on the problem which is being faced by the customers such as long queues and hours of waiting. After implementing GPS system on toll plazas the problem of long queues, wastage of waiting time, fuel and energy can easily solved. Researcher try to explain the system of toll which is actually under the control of government and partially under the control of private owners. Construction of toll plazas need a lot of money to invest, this money can recover by the passengers who crosses the toll plaza.

Sheenam Naaz (2020) concluded in research that automation is spreading all over the world. Artificial intelligence (AI) is being used as a base for RFID which on the issues faced at toll plazas. Customers go through stress while they wait in long queues at the toll plazas. To remove the old method of collecting toll tax AI based system is implemented. As per the study the whole system of collecting tax will be transparent, more effective and reliable. There is no need of any major modification or vehicles or highways. As the fastag cards can be used to deduct money which is reusable and rechargeable at any toll booth.

4. Research Gap

It has been discovered from the aforementioned literature analysis that no research has been done on the impact of Robotic Process Automation on customer satisfaction at toll plazas.

5. Objectives of study

1. To find out demographic location of toll plazas users
2. To evaluate problems faced by the customers at toll plazas.
3. To examine the satisfaction of level of customers at toll plazas.
4. To reevaluate factors which affects the satisfaction of customers at toll plazas.
5. To recommend a suitable Robotic Process Automation model for toll booths

6. Methodology of the study

Method: - this research study is based on both quantitative and qualitative data. This is worthy for my research work as it help to answer



Figure 2

<https://th.bing.com/th/id/R.a08e82a2881912eea2e297ae152d417d?rik=Is1nwQJC56nVKw&pid=ImgRaw&r=0>

the query of implementing Robotic Process Automation in customer satisfaction at can be seen in Figure 2.

Research convictions: - The usage of Robotic Process Automation on toll plazas is one of the presuppositions in the research philosophy, which is crucial to take into account because it may affect the decisions and approaches taken in terms of the study.

Research approach: - my research is being studied in a rather inductive manner. Utilizing this method, one can explore phenomena and learn about the nature of a problem.

Data collection: - on both primary and secondary data this study is built. For this, a variety of online sources were examined as well as several helpful journals. To produce the required outcome, in-depth studies were carried out. During the investigation descriptive analysis was used.

7. Limitations of the study

This research is particularly based on the customers of some particular districts of Rajasthan. This is the one basic limitation of this study.

8. Interpretation

After reading several papers, reading a lot of articles and through the survey conducted the result came out is. Electronic toll collection which

we might refer to as “smart toll collection” for customers has a number of advantages:-

- Enhance transaction speed and minimize travel delays.
- Ensure that clients are comfortable and have greater convenience.

9. Conclusion

As discussed above customer play a vital role in Indian economy, ups and downs in market can only controlled by the customers. This study aims to determine the effect of robotic process automation on customer satisfaction at toll plazas. In today's competitive world the major target of any company is to maintain long term relationship with its customers. In order to reach this goal one has to keep an eye on customers need and demand, therefore it is pretty much important for every company and organization to understand and analyze the need of customer. The researchers have tried to grab attention on some main factor like huge amount of traffic create a lot of difficulties for customers such as wastage of time in long queues, improper services at toll booths, no proper response from toll booth employees, lack of knowledge regarding Robotic Process Automation in employees etc. As above mentioned with the help of appropriate research study it has been observed by the researcher that after implementing Robotic Process Automation at toll plazas, customers are being satisfied with the performance of toll plazas and their employees. Without Robotic Process Automation there is no existence of toll plazas as automation can do multiple tasks within a very short span of time.

10. Future scope

Rapid change in customers need and development of infrastructures requires technology which provide more benefit in very short time. Thus Robotic Process Automation came out as a boom in the world of technology. Due to use of Robotic Process Automation (R.P.A.) there has been a large increase in the volume of transactions that are carried out each day at toll booths, which has eventually enhanced throughout the entire system.

11. Suggestion of present study

Performance of toll plazas in developed nations are entirely different from the developing nations. The factors related to study like huge traffic,

long queues, waiting time, improper services at toll plazas, no proper response from customers, lack of proper knowledge varies from toll to toll. Based on these major factors there is limited study on Robotic Process Automation at toll plazas in developing countries like India. But now days this topic is on peak of research by the new researchers the point of traffic congestion. Therefore the explained review presented in this study is beneficial for the upcoming researchers and it will give them operational insight.

12. Acknowledgement

For their cooperation and involvement in facilitating the study process, I would like to thank Dr. R.K. Tailor Sir.

References

- [1] Akshay. N et al, A study on Passenger's Satisfaction Using Fastag with Special Reference to Coimbatore City, *International Journal of Research and Development*. Vol 6, Issue 4, ISSN 2455-7838.
- [2] Dini Dwi Wulandary et al, Investigating Customer Satisfaction of the Bakauheni- Palembang Toll Road, *Jambura Science of Management*, Vol 4, ISSN 2655-3651.
- [3] Ian Lerche. Epidemic evolution: Source, lock-down and removal modifications to the SIR model, *Journal of Statistics and Management Systems*, 25:8, 1767-1780 (2022), DOI: 10.1080/09720510.2021.1972622.
- [4] Osman Kamari & Morad Alizadeh. The type 2 extended exponentiated family of distributions, *Journal of Statistics and Management Systems*, 25:8, 1735-1749 (2022), DOI: 10.1080/09720510.2021.2011115.
- [5] Satya Srikanth P et al, International; *Journal of Computer Science and Mobile Computing*, Vol. 5 Issue 8, p.g 247-253 (August- 2016).
- [6] Shirina, S., Sharma, R., Agarwal, R. N., & Sao, A., Factors affecting employee engagement in higher education institution-An empirical study in NCR. *Journal of Information and Optimization Sciences*, 43(7), 1779-1800 (2022).
- [7] Sofia Khan, R. K. Tailor, Ranu Pareek, Rashmi Gujrati & Hayri Uygun. Application of Robotic Process Automation in education sector, *Journal of Information and Optimization Sciences*, 43:7, 1815- 1834 (2022), DOI: 10.1080/02522667.2022.2128534.

- [8] Lin, Y., Wang, P. & Ma, M. Intelligent transportation system (its): Concept, challenge and opportunity. In 2017 IEEE 3rd international conference on big data security on cloud (bigdatasecurity), iee international conference on high performance and smart computing (hpsc), and IEEE international conference on intelligent data and security (ids), 167–172 (IEEE, 2017).
- [9] Marsden, G. & Reardon, L. Questions of governance: Rethinking the study of transportation policy. *Transp. Res. Part A:Policy Pract.* 101, 238–251 (2017).
- [10] Sun, L. & Yin, Y. Discovering themes and trends in transportation research using topic modeling. *Transp. Res. Part C: Emerg. Technol.* 77, 49–66 (2017).
- [11] Tailor, R., Pareek, R. & Khang, A. Robot process automation in blockchain. In *The Data-Driven Blockchain Ecosystem*, 113–125 (CRC Press, 2022)
- [12] Sheenam Naaz et al, An Artificial Intelligence Based Toll Collection System, ICIDSSD2020, February 27-28, New Delhi.
- [13] Sudheer Kumar Nagothu, Automated Toll Collection System Using GPS and GPRS, International Conference on Communication and Signal Processing.
- [14] Herry T. Zuna et al, Analyzing Service Quality of Toll Road and its Relation with customer Satisfaction in Indonesia using Multivariate Analysis, International Conference on Quality in Research, ISSN 1411-1284.
- [15] Ministry of Road Transport and Highways, India (MORTH).