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Performance evaluation of Robotic Process Automation on waiting lines of toll plazas

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Abstract

robotic process automation came into force in early 2000 as a new wave in technological world which is based on the concept of machine learning. Concept of machine learning provides a base to R.P.A. to gain grounds in digital field. Objectives: nowadays waiting lines are the biggest problem faced by customers at toll plazas, increment in number of vehicles create traffic congestion at toll booths. To eliminate this problem a new technique is installed in the form of fastag to improve work efficiency of toll plazas. Methodology: This conceptual study was based on secondary source of data, for this various papers have been reviewed to find out the gap for study. Findings: on the basis of literature review and survey the result came out is, that after applying robotic process automation on toll plazas customers are more satisfying and enjoying hassle free travelling, performance of toll booths are getting refine day by day. Conclusion: this paper is conceptual and descriptive the literature reviewed identified an empirical research gap. By adjoining RPA to this patrimony, the performance can be significantly improved which results in higher customers satisfaction.

Keywords: robotic process automation, toll plaza, performance evaluation

Introduction

Rapid growth of digital advancement is on peak in every sector of economy Nowadays robotisation is trending everywhere in every organization and in every aspect of economy. Robotic process automation is practically implemented in every financial as well as non-financial sector. Forecasting the future of hassle free operational activities become an essential task for every entrepreneur. As per the survey 54% of European companies are planning to automate their business operations within 2020, it was predicted that more than 4 million robots are installed for official work and market will grow by 2.9 billion approx. in near future. If we talk about automation in toll plazas, we will found that there are a lot of issues which are being faced by customer while travelling. Such as waiting lines, technical glitch, unauthorized cars, traffic congestion, insufficient funds, malfunction or damage of fastag etc. operators not worked properly, no proper arrangements of vehicle crossing which in turn came out as customer frustration, stress and dissatisfaction. After implementing the system of radio frequency identification device (RFID) to toll booths, travelling become smooth and easy for travelers. Instead of paying cash customers are paying through fastag, in which automatically amount deduct from the account linked with the bank. Beside of all these advancement in toll plazas customers are still facing problem in form of waiting lines, which creates stress in them. My study is based on the some literature which I have been reviewed for my research. Which provide a base to my research. Here is the brief introduction of concepts which I used in my study.

What is Robotic Process Automation (RPA)?

The term R.P.A. came into force in early 2000. Its primary development was started in year of 1990s. The base on which R.P.A. was came into existence was “Machine Learning”. It has provided foundation to R.P.A. Machine learning was came into force in 1959 by “Arthur Samuel”

Robotic process automation is a suspensive term in itself. Which contains various technological advancement in it. Description of this technological term is as follows:-

Robotic Process Automation: - An anti-workforce technology in the shape of business process automation which is completely based on artificial intelligence and digital labour. It is popularly known as software robotics. In other words “A technical way of automating organizations activities with the assistance of bots to minimizing human efforts.

Here is a brief elaboration of each term of this technique:-

1 .Robotic: - These are the systems who copy human works and actions and perform accordingly.

2 .Process:- Group of steps which are going to lead a productive and effective task.

3. Automation: - Any kind of process which is done with the assistance of robots.

How R.P.A. works?

This query always comes in everyone’s mind is that R.P.A. uses physical bots or they are actually software created by I.T. technicians to do business activities with an ease.

R.P.A. do not fully replaces humans with robots, they are the softwares which performs like humans and work accordingly. R.P.A. adopted with the use of softwares through artificial intelligence. These are software are nothing just only Robotic process automation tools.

Figure 1. source: forbes.com

What is toll Tax?

Toll Tax: It is a highway or a part of highway, where the road users pay a certain amount as a fee for using the road for travelling. Toll roads are also called “TURNPIPE” or “TOLLWAY”. A public or private road (almost always a controlled access highway) for which a certain fee called toll is fixed for traveler. A kind of road pricing system basically implemented to assists in recovering the costs of road construction and maintenance. The amount charged from the traveler varies from vehicle to vehicle.

What is Fastag?

Fastag-Fastag is a device which is introduced by NHAI and which is very easy to use while making payment at toll booths. It is a kind of reloadable tag from which automatically amount deduct when a vehicle passes though the toll gate. This device is linked with pre-paid account from which the toll fee is deducted. Fastag works with a technology which is known as RFID (Radio frequency identification device).Major benefit for car drivers as well as the highways of India. Vehicle drivers can go through toll booths without any inconvenience of stopping at waiting lines, fastag system cut down their waiting time and allow them them move freely without wasting their time.

Statement of problem

There are a lot of problems on toll plazas which can be divided into financial and non-financial factors which affect the efficiency and customer's satisfaction while travelling, such as resources, infrastructure, advance techniques, stress, satisfaction, waiting time etc. Hence, robotic process automation has been implemented for evaluating the performance of on waiting of toll plazas.

Literature Review

KP Naveen Reddy (February 2019)

This paper is based on application of robotic process automation in businesses. With the use of graphical user interface robots acts like humans and perform according the instructions installed in them. RPA is being used in different different sectors like workplace, banking, human resource management, software industries etc. with the use of RPA complicated tasks are completed with minimal human efforts. RPA works with software packages, which are customized as per industry's requirement.

Audrey Bourgouin (April 2019)

The study was conducted to understand the benefits came out by applying Robotic process automation in organizations. Number of benefits in the form of business efficiency, hike in productivity, data security, improvement in accuracy etc. The main focus of this paper is to assists organizations for implementing robotic process automation in organizations. A new system is introduced to adopt RPA in organizational tasks. Still there are a lot of problems which industries are facing, to solve that problem organization should have to improve the existing properties of RPA.

Sourav Dey (January 2020)

This study focused on the fact that Robotic process automation is expanding its arms in every sphere of economy, and use of traditional business methods are lagging behind. This paper investigate differences between 2 different parts of stakeholders which are users of RPA and products of RPA. For growth of industries RPA is expanding as a key element which moves businesses towards transformation and sustainable growth. It creates the balance between humans and technology and work as a bridge to achieve goals. The main issue which came out in this paper is that how we can design and develop RPA to generate maximum value.

Nayan Parmar (April 2018)

This paper based on the study that how new system of collecting toll tax is far better than that traditional way of collecting toll. Existing system has some problems to solve this problem a device For collecting toll tax automatically is implemented called fastag which fix on the windshield of car with RFID (radio frequency identification device) has installed which makes toll collection easy and fast, beside this an additional system is installed with image processing setup. System not only reduce waiting time but also reduce traffic congestion and save fuel. It is very efficient which replaces human efforts with bots.

Manjunath Singh (June 2019)

This study shows that at present toll plazas can completely be managed and run by using RFID technology. In this paper some of the RFID based toll collection systems have been studied, as long waiting lines at toll plazas are observed by users, which creates stress and dissatisfaction in customers. It shows that new system of collecting toll provides advantages to both the authorities and the users. Amount of collected toll contributes major portion of revenue in our economy which in turn maintain fairness of transaction between the rich and poor users.

Bharavi Joshi (November 2017)

This study shows the comparison between traditional systems of collecting toll with the existing automatic system of collecting toll. In old system toll operator collect cash and provide receipt to user whish was very time consuming process. The systems which are studied in this paper is fastag with RFID device, Automated Toll Collection System (ATC) and Book My Toll system through android application, rather than these system a new system using image processing device is also suggested in this paper. These systems speed up the process of toll collection and reduce traffic congestion. In image based system toll payment automatically deducted through mobile wallets, credit card and net banking before crossing toll booths.

Research gap

Based on the above literature review, it has been observed that the performance evaluation of Robotic process automation on waiting lines of toll plazas has not yet studied.

Objectives

Followings are the main objectives of the study:

1. To study the Robotic Process Automation (RPA) on waiting line at toll plazas.

2. To identify the factors affecting waiting line at toll plazas.

3. To evaluate the performance of Robotic Process Automation (RPA) on waiting lines of toll plazas.

4. To evaluate the parameters of Robotic Process Automation (RPA) applicable for toll plazas.

5. To analyze the factors affecting Robotic Process Automation (RPA) in the waiting line system at toll plazas.

6. To suggest an appropriate Robotic Process Automation model for toll plazas.

Hypothesis

1. Ho_1: There is no significant relationship between Robotic Process Automation and financial and non - financial performance of toll plazas.

2. Ho_2: There is no significant relationship between implementation of robotic process automation and waiting lines at toll plazas.

Scope of Research Study

The present research attempts to study the performance evaluation, waiting line and traffic congestion with implementation of Robotic Process Automation on toll plazas.

Research Methodology

Method

This study is totally based on the qualitative research methodology. This is suitable for my research as it is used to answer the query about performance evaluation and implementation of robotic process automation on waiting lines of toll plazas.

Research Philosophy

The research philosophy contains assumptions about the use of robotic process automation on toll plazas, and it is essential to consider since this comparison can influence the choice and strategies that are made regarding the research.

Research Approach

The study of my research is kind of inductive in nature. This approach is used to investigate phenomena to get to know the nature of problem. This study describes the performance evaluation of robotic process automation after implementing artificial intelligence on toll plazas.

Data Collection

This study is based on secondary data. For this various number of online sources were watched and reviewed some beneficiary journals .In depth studies were conducted to bring out the desired result. Descriptive analysis was carried out during the research.

Picture of Daulatpur Toll Plaza

Figure 2. Source: justdial.com

Conclusion

The above conducted literature review provides a theoretical and empirical research base for study. Robotic process software is suitable to eliminate human tasks with bots to save time and money. As per the survey 110 to 140 million manual tools are replaced by software by the end of 2025. We conducted descriptive study on the experience faced by customers at toll plazas while passing through toll booths.

Performance of toll plazas are evaluated after implementing Robotic Process Automation. It found that customers are facing time issues in from of waiting lines at toll booths. Waiting lines at toll plazas are the biggest hurdle faced by travelers while passing through toll booths, to solve this problem a new system is installed which is known as fastag. It works with RFID technique which save time and provide save and free traveling experience. Through this deep analysis and study to some literatures it is proved that Robotic process automation is like a boom in sector of transport for toll plazas operators as well as travelers.

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