

## THE IMPACT OF DATA COLLECTION ON THE FASTAG

### SATISFACTION LEVELS OF CUSTOMERS

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#### Abstract:

FASTag is a device that employs Radio Frequency Identification (RFID) technology for making toll payments directly while the vehicle is in motion. FASTag (RFID Tag) is affixed on the windscreen of the vehicle and enables a customer to make the toll payments directly from the account which is linked to FASTag. Radio frequency identification (RFID) technology is an automatic identification method using radio frequencies between RFID readers and tags. In RFID systems, tag collection is very important issue to collect data from all the tags in reader communication range using anti-collision algorithm. There are several researches to develop the efficient anti-collision algorithm, but they almost focus on passive RFID systems and show the simulation results. This paper focuses on tag collection in active RFID systems complying with ISO/IEC 18000-7 standard. FASTag is a prepaid tag, affixed on vehicle's windscreen that enables automatic deduction of toll charges and lets the vehicle pass through the toll plaza without stopping for cash transaction. This has also resulted in smooth and hassle-free movement of FASTag users on highways. In this study I analyse the data collection method and problems of fastag in Valavanthankottai NH-67 of Tamilnadu between Thanjavur to Trichy highways. The required data were collected totally from 50 customers. The value of this study is time management.

**Keywords:** Radio Frequency Identification, Data, Information Technology, Satisfaction, FASTag.

#### I Introduction

FASTag is an electronic toll collection system in India, operated by the National Highway Authority of India (NHAI). Indian Highways Management Company Limited (IHMCL) (a company incorporated by National Highways Authority of India) and National Payment Corporation of India (NPCI) are implementing this program with help from Toll Plaza Concessionaires, FASTag Issuer Agencies and Toll Transaction Acquirer. As trade between countries increases and the logistics to be managed in harbours increase accordingly, automated systems are required to manage harbours efficiently. To build these automated systems, Radio Frequency Identification (RFID) technology has recently come into the spotlight. FASTag has 5 Years of validity. The tag has a validity of 5 years and after purchasing, you only need to recharge or top up the tag as per your requirement.

#### II Literature Review

- Published in: 2014 IEEE 15th International Symposium on High-Assurance Systems Engineering. The integration of sensing capability into active RFID tags has recently generated a lot of interest among the RFID community. In any sensor enabled Radio Frequency Identification (RFID) system data collection is done continuously. Data collection in this context can refer to the computation of statistical means and moments, as well as other cumulative quantities that summarize the data obtained by the system.
- Published in: 2011 IEEE 13th International Conference on Communication Technology Specific method which is used to adjust frame size is not given by the Dynamic Frame Slotted ALOHA algorithm in the ISO/IEC 18000-7 air interface protocol. To solve this problem, an approach is proposed in this paper. The Slot Size is analyzed first. With the condition of determined Slot Size, the number of

unidentified tags around the Reader after the initial collection round is estimated. The frame size will be adjusted according to this number. Analysis shows that the throughputs of active RFID system can be very close to the maximum theoretical value when the proposed mechanism is applied. Via MATLAB, for 100 tags, simulation results indicate that the throughputs of RFID system are steadily remained a high performance by using this approach.

- Published in: 2014 IEEE International Microwave and RF Conference (IMaRC)  
Chipless RFID systems are perhaps the most eligible candidate for catering to the demand of low-cost multiple item tagging in the future. However, one of the main challenges in chipless RFID systems, is its lower data capacity. Earlier we proposed a MIMO based chipless RFID system which has a higher data capacity using a threshold based detection technique. Maximum likelihood (ML) detection techniques have shown that the reading reliability can be significantly improved on a SISO chipless RFID system. In this paper, we present a detection technique that can be used to detect tag data bits in a MIMO based chipless RFID system. Preliminary results show the validity of the proposed detection method in terms of detection error rate under different noise conditions.
- Published in: 2009 IEEE International Conference on RFID. Active radio frequency identification (A-RFID) is a technology where the tags (transponders) carry an on-board energy source for powering the radio, processor circuits, and sensors. Besides offering longer working distance between RFID-reader and tag than passive RFID, this also enables the tags to do sensor measurements, calculations and storage even when no RFID-reader is in the vicinity of the tags.

## **Methodology**

### **III Objectives**

- To assess the understanding of service efficacy and its aspects among customers
- To analyze the impact of service efficacy on customers in FASTag
- To analyze the satisfaction levels of customers
- To analyze the trouble of recharge method of FASTag

### **Sampling design**

The required data were collected totally from 50 customers.

### **Area of the Study**

The location selected is at Valavanthankottai NH-67 of Tamilnadu between Thanjavur to Trichy highways.

### **Data Collection**

A pre-tested questionnaire was prepared and used to collect the Primary data. Journals, Magazines, Publications and Various websites have been referred to collect the secondary data. The published research reports and market studies also helped the researcher to probe into the problem.

### **Statistical tools used**

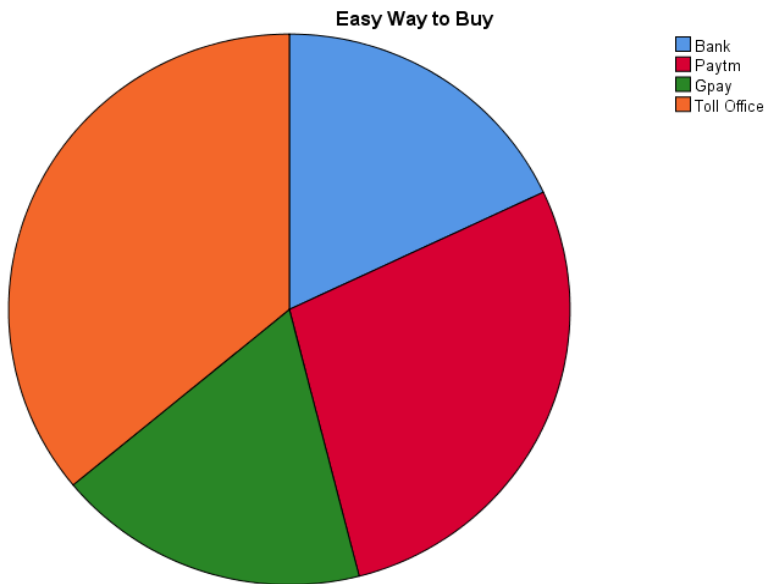
The collected data have been consolidated, tabulated and analyzed by using relevant statistical tools like, Frequency Statistics, Descriptive statistics, Standard Deviation, ANOVA, Correlation was utilized for analyzing the data. The consequence of the study is done by using tables, graphs and charts to give meaningful results.

**IV Data analyses**

**Table 1.1 Frequency Tool**

Easy Way to Buy					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bank	9	18	18	18
	Paytm	14	28	28	46
	Gpay	9	18	18	64
	Toll Office	18	36	36	100
	Total	50	100	100	

**Chart1.1**



**Consequence:**

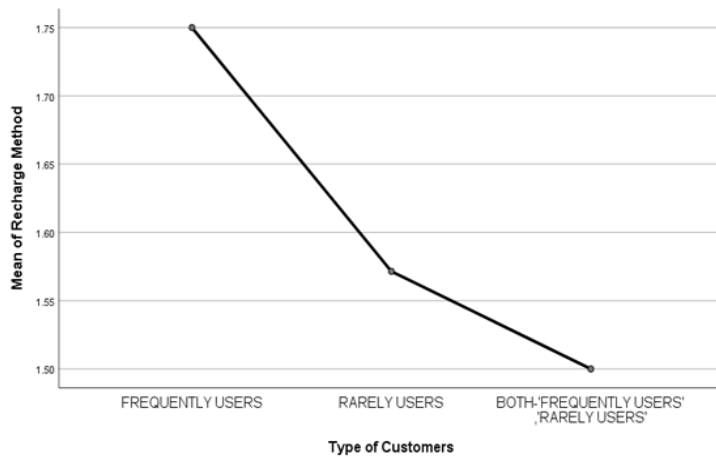
From the above table (1.1) is 18% of the respondents said bank is easy, 28% of the respondents said paytm is easy, 18% of the respondents said gpay is easy.

**Table2.1**

**One Way ANOVAs:**

Descriptives								
Recharge Method								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
FREQUENTLY USERS	16	1.75	0.44721	0.1118	1.5117	1.9883	1	2
RARELY USERS	14	1.5714	0.51355	0.13725	1.2749	1.8679	1	2
BOTH	20	1.5	0.51299	0.11471	1.2599	1.7401	1	2
Total	50	1.6	0.49487	0.06999	1.4594	1.7406	1	2

**Table 2.2**



**Table 2.3**

ANOVA					
Recharge Method					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.571	2	0.286	1.175	0.318
Within Groups	11.429	47	0.243		
Total	12	49			

Robust Tests of Equality of Means				
Recharge Method				
	Statistic <sup>a</sup>	df1	df2	Sig.
Welch	1.254	2	29.777	0.3
Brown-Forsythe	1.181	2	44.003	0.316
a. Asymptotically F distributed.				

**Consequence:**

The above table No.2.2 Followed by degrees of freedom between and within (2 and 47) and the F value (1.175). next is the p value sig as .318 .table 2.3 shows the report Welch anova sig level is .300 and brown sig level is .316.

**Table 3.1**

Correlations				
			Data Collection of FASTag Service	Does the FASTag have Satisfaction to Cross the Toll
Spearman's rho	Data Collection of FASTag Service	Correlation Coefficient	1	.442**
		Sig. (2-tailed)	.	0.001
		N	50	50
	Does the FASTag have Satisfaction to Cross the Toll	Correlation Coefficient	.442**	1
		Sig. (2-tailed)	0.001	.
		N	50	50
**. Correlation is significant at the 0.01 level (2-tailed).				

**Consequence:**

- The value of the correlation (Table 3.1) shows the sig value is .001, if the sig value is less than 0.05, then there is a significant correlation between the variables. The strengthen correlation satisfaction level is 0.442.

**Discussions and Implications**

- The findings from the study are discussed below. The tag can be obtained at toll plazas or issuer agencies such as banks, paytm, gpay, but majority people give first preference to toll office.
- The respondents give the opinion about recharge method of FASTag services and type of customers using one way anova.
- The response was analyzed using correlation and the result is that the pattern of impact and satisfaction levels of fastag is convenient.

## Conclusion

I don't like to add any demerits in my paper because FASTag is a newly begun in india and at beginning it may be making little mistakes. But every problem will give a new solution and the new growth!

Over the past years, motorists have become used to spending at least 15-20 minutes crossing a user-fee plaza on national highways. Some past studies have assessed that the nation loses about 60,000 crore annually in terms of fuel and time loss due to the waiting time at the user-fee plazas.

With this backdrop, it is imperative for the government to work towards taking steps to reduce the time taken to cross a user-fee plaza. A prudent solution to the problem involved adopting technology, which reduced the waiting time and allowed the vehicle to pass through without stopping.

## Limitations

- One of the main limitations was the availability of time to collect the data which delayed the further processing and analyzing of the data.
- The study is confined only to valavanthankottai toll in Trichy.
- Due to time constraint, the research covered only a limited period of study i.e. Jan 2020.
- Sample size is limited to 50. The sample size may not adequately represent the whole toll.
- The information given by the respondents may be biased due to various reasons.

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