

Leveraging big data and IOT for retail

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Abstract

Objectives: To give a good shopping experience to consumers in retail outlets. This is done by using the big data that is available with us and IOT to develop a mobile application that suggests products through his mobile.

Methods/Statistical analysis: The retail outlets can use the Big Data and IOT to give a better shopping experience to customers. This on another side can improve the business of retailers by converting the footfalls into business. The data is used to suggest products in the mobile based on shopping behavior. This method is already available in E tailing.

Findings: This approach is a novel initiative here. This can help people to buy more products in a short span of time as they now have will get suggestions from the retailer about the products. This will create a competitive edge for the retailer over others. This increases the loyalty of the consumers and retention of consumers will improve.

Application/Improvements: This technique which is followed in inventory management systems can now become a mobile application and improves shoppers experience and customers loyalty of brick and motor retailers.

Keywords : Retail(brick and motor), Big Data, Analytics, IOT, Browsers, Consumers.

1. Introduction

Basics of IOT :

In simple layman terms IOT is any physical, tangible object that usually has a sensor embedded in it so that becomes a part of a digital network. When any object becomes a part of the digital network, it has this ability to collect and exchange data. When the object is able to perceive data and manipulate it, that object becomes smart. In today's mercurial word physical objects being smart has become indispensable. IOT has a huge impact on various sector like manufacturing, healthcare, banking, retail, security, energy transportation and logistics. The list would go on that is how IOT has become a part of everyday life.

The science behind IOT: The whole idea of IOT is to make an object smart and think behalf of us. So the pre-requisites for an IOT is information so that the device is able to decide for itself and give the user its suggestion. To collect such a data one need a sensor then only one will able to process it Once the device detects the physical property it either responds to it or records it, at times it does both simultaneously. Sensors are of multitudinous types. The sensor everybody would have come across is the proximity sensor in our smart phones. It is a sensor that detects the presence of nearby objects without physical contact. It works based on detecting electromagnetic field and senses based on change in the field or return signal. Sensors is a huge topic and the quintessential of IOT. Nowadays small bluetooth enabled devices called iBeacons and other smart devices are used to implement IOT.[1][2][3]

2. Methodology or Technique used:

IOT In Retail:

All of us are aware of the fact that retail means the sale of goods in relatively small quantities for use or consumption rather than re-sale. So the whole retail market is about the customer. So the whole Retail Management boils down to how satisfied the customer is when it comes to providing a marvelous shopping experience. Any human would require that complete attention is given to him/her when they are inside the retail emporium, for which we have sales personnel but we know it is humanly strenuous to cater to the customer's needs immediately. This is where IOT plays its role to provide the customer a better shopping adventure. With the advent of E-Commerce Giants, it has become really essential for retailers to enable IOT in the shop floors so that they still stay energetic in the race. Retailers are trying to provide a personal experience to the customer and are gaining an insight into customer behavior.

Ways in which IOT Is Deployed: The different areas in retail where IOT is deployed are:

- 1) Inventory System
- 2) Payment Gateways
- 3) Sensing Shop Behavior of Customer
- 4) Intelligent Shopping Application[4] [5]

Inventory System:

Inventory System is management science to specify the percentage of stocked goods based on the demand and supply. Making these systems smart would eradicate the hustle of tracking products and monitoring supply and demand.

Payment Gateways:

Making the payment gateways smart helps to save a lot of customers time spent. The NFC or NEAR FIELD COMMUNICATION technology helps implement smart payment. Using NFC's customers can pay wirelessly using smart phones.

Sensing Shop Behavior of Customer:

This system is basically of advantage to the retailer, using this kind of wireless sensing the retailer would be able to predict the customer's behavior and accordingly provide suggestions based on the customers necessity. The technology used to implement this system is iBeacon which helps the server connect with customers smart phones. This system can also help the retailers optimize store layouts in the future. [6]

Intelligent Shopping Application:

A retailer specific shopping app can help the retailer intimate about personalized offers and interact with them easily.

Retailers who are implementing such a system:

Disney theme parks are implementing IOT in an highly efficient manner. Almost all the Disney Theme Parks have a Magic-Band that provides theme park access and helps track the customer. They use really simple technology called RFID to implement this.

The great retail giant WALMART were pioneers in using IOT to solve their inventory problems using RFID technology. They have improved a lot using IOT and in almost all aspects WALMART has started using it. It helps them provide better experience for customer.

BIG DATA ANALYTICS:

Basics of Big Data Analytics:

In simple terms big data means the science of enhancing decision making process, with the help of big existing data. The examination of existing humongous data helps to uncover hidden patterns, unknown correlations and other useful information. This information can be put to use to make useful predictions for future trend in a particular area. Big Data helps improve accuracy, efficiency and automation for all kinds of system.

Tools for big data analytics:

There is various software tools used for Big Data Analytics. The two vastly used software are HADOOP and SAS.[7]

Use of big data analytics in retail:

Most of the retailers use big data analytics basically to study the behavior of customers. The trend of their buying discloses the retailers a pattern that enables them to provide the customers a wonderful shopping experience. The customer is made to feel extra special when they are constantly notified about their requirements at the exact time. This at times leads to the customer getting annoyed but using proper mechanisms the customer can be made to feel comfortable.

3. Discussion

As a customer we ourselves would have had real time experiences in a big retail emporium. When purchasing a certain product we might have dropped the idea of buying it at a particular instance may be because of the price or

for any other reason. Now with respect to that particular product we become a browser. The retailer may not know why we haven't purchased the product; it is kind of difficult for him to predict it. For most of us the reason may be price, at times quality.

So now he is in the need of some means to converting the browser into a prospective buyer. To address this problem let us exploit BIG DATA ANALYTICS and IOT.

Use of big data analytics and IOT in retail

To turn a browser into buyer

Using IOT and BIG DATA ANALYTICS, we have the power to find out the absolute necessities of a customer. The retailer can provide a mobile application that helps the customer prepares shopping list. This list helps us identify the shopping behavior of the customer. The retailer can also have another feature added to the mobile application which helps the customer track the aisle where a particular product will be available. This helps the retailer find out if there is any ambiguity in the customers buying behavior. This entire data is automatically transferred to the retailer's database through the server of the retailer. The sever helps process the data and generate a bill as well, this reduces the amount of time a customer spends paying for the purchase made. The retail store can provide with wireless mobile connectivity to the customers mobile. At times this becomes disadvantageous, when a lot of users connect to the internet connection. Therefore with the help of IOT and BIG DATA such a system can be implemented where the retailer will be able to find out why a customer has a second thought on buying a product and may be through notifications and feed back the retailer will also be able to find out the exact reason why it the customer chose not to buy a particular product. Thus this implementation helps the retailer turn a browser into a buyer.[8] [9] [10]

4. Conclusion

This system is perfect but for one thing. A lot of notifications and certain free-spoken questions might annoy the customer. So we should make sure that the notifications are sent periodically and the questions should be masked. The future research should be put into how to mask the questions so that the retailers are given accurate answers and we make sure the customer is made to feel comfortable as well.

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The Publication fee is defrayed by Indian Society for Education and Environment (www.iseeadyar.org)

Cite this article as:

A.Vintha Rao, Dr.P.Shalini. Leveraging big data and IOT for retail. *Indian Journal of Economics and Development*. Vol 4 (3), March 2016.