Enhancing Customer Shopping Experience with Indoor LBS in Retail Stores

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Abstract

Indian Retail sector has seized every opportunity and has evolved over the time from weekly markets and fairs towards a more organized form of supermarkets and malls. Evolving mobile technologies are now implemented in every field including the retail markets. This paper is focused on the how the field of telecommunications can be leveraged to enhance the customer shopping experience using Location Based Services in the Indian retail space.

Location based Services are set of applications which use the position data of a person or object to provide with relevant personalized information. These find vast use for Navigation services, Geo-tagged news, Gaming, Social networking and Advertising.

Organized retail in India over the past four years has shown a CAGR of 19.5%. One stop stores like the Hypermarkets is the new trend with huge shelf spaces and large product lines because of its enhanced efficiency and customer experience. But, this scale also induces challenges for both the retailers and the customers. The following are the list of challenges faced by customers and the retailer

- Matching the exact needs of the customers without much wandering [*Navigate*]
- Absence of exact match of requirements [*Availability*]
- Providing accurate and timely information/ updates [*Dynamic*]
- Uncertainty on the availability of the product [*Update*]
- Lack of knowledge on the arrival of the stock and managing inventory [*Efficiency*]
- Retaining customer base and keeping them involved [*Engage*]

Many retailers are already using the RFID technology to increase supply chain visibility, manage stocks and supplies efficiently. With LBS, retailers have whole new set of services to offer to customers and improve their shopping experience while at the same time leveraging this technology to increase revenues and maintain loyal customer base. Creating the right eco-system and implementing right mix of Wifi, LBS and smart devices for customer services, retailers can evolve the local malls to Smart Malls.

Keywords: Retail Sector, Location Based Services, Customer Shopping Experience

1. Introduction

Innovations in the field of telecommunication are now touching the lives of humans in every aspect. According to Richard Branson –

'Business opportunities are like buses, there's always another one coming'

That's how the retail sector has seized every opportunity and has evolved over the time from weekly markets and fairs towards a more organized form i.e. the supermarkets and malls. The Indian retail space has also followed the same path. The retail sector is the fastest growing sector in the Indian economy. It is comprised of both organized and unorganized sectors. This transition has made the environment more competitive with the mom and pop stores under severe stress because of the emergence of supermarkets and departmental stores which enabled efficiency and enhanced shopping experience. Organized retail in India over the past four years has shown a CAGR of 19.5% compared to 11% growth of the total retail space *(Deloitte, 2010)*. More recently, the corporate backed retail spaces and hypermarkets are in vogue because of the increased western influence among Indian consumers and the corporate. Retail facilities with a range of products and variety beyond the supermarkets come under the category of hypermarkets. These hypermarkets occupy huge floor space and are meant to cater the needs of a household while sticking to the idea of 'all under one roof' (GROUP,

2011). These one stop stores with huge shelf spaces and large product lines have thus induced lot of complexity for both the retailers and the customers. Further, we will list out the challenges in the retail space and how the evolving mobile technologies can be leveraged to address them.

2. Leveraging Location Based Services

Location based Services (LBS) are set of applications which use the positional data of a person or object to provide with relevant personalized information. These find vast use for navigation services, geo-tagged news, gaming, social networking and advertising.

Various technologies used to identify the correct position and provide these LBS are:

- Simple GPS based location detection which requires the cell phone to be equipped with GPS chip
- GSM localization which finds location of a mobile device to its nearest cell site/tower
- Bluetooth, Wi-Fi and RFID based solutions also exist which provide better indoor location data

These applications assist the user with personalized content and can be accessed through different channels for delivery to end customer:

- SMS updates are common to engage the customers
- Social networking websites is another tool
- Android and other OS based applications for the smart phones to access these services
- USSD menus to provide customers with various options to choose from and interact further

Modern day retailers have a lot of challenges in terms of adapting to the latest technological innovations to compete in the dynamic Indian markets. The latest technology and infrastructure implementation in the retail space is essential to match the increasing customer expectations, global shopping standards and to compete with the efficient and effective online shopping stores.

Many Indian retailers are already using the RFID technology to increase supply chain visibility, manage stocks and supplies efficiently. With LBS, retailers have a whole new set of services to offer to customers and improve their shopping experience while at the same time leveraging this technology to increase revenues and maintain loyal customer base (Mobile Marketing, 2011).

The Smartphone market is fast developing as consumers look for applications beyond voice and SMS and it will further intensify with high performance processors and enhanced battery life. Even though the trends indicate cumulative growth in the smart phone market, Indian mobile market still comprise of large customer base using feature phones which don't even support Global Positioning System (GPS). Thus Retailers need to have proper strategy in place to implement latest technology solutions which will enable them to cover the majority of their customer base effectively and provide them the best shopping experience.

3. Problem Statement

Changing lifestyles and time scarcity has driven the Indian consumer more towards the one stop stores like supermarkets and hypermarkets.

To present the current shopping scenario and issues related to the purchasing at hypermarkets, we will look at the story of an Indian consumer in a super market. Ram a frequent purchaser on a typical Saturday, was dumping the items in to his shopping cart at the supermarket near his house. He visits this place each week to meet the everyday needs of his family for the following week. The cart is full and he is wandering all over the shop floor, scanning for the items that he is supposed to purchase. Since it was a weekend by the time he approached the billing counter, the long queues and the additional time lost while wandering to locate the items he wanted, disturbed his schedule. These problems get compounded with the extensive parking facilities that are usually allotted to these large shopping spaces.

The following are the challenges that one might encounter while shopping in these large spaces

- Matching the exact needs of the customers without much wandering: The customer might have to spend substantial time understanding the shop floor plan about the various sections and then he/she has to identify the right shelf where he can pick the desired item.
- Absence of exact match of requirements: The customer because of the ignorance of a substitute and difficulty in finding assistance from the staff because of the large shop floor might end up leaving the place without any purchase. This will lead to less conversion rate of actual purchase versus footfall.

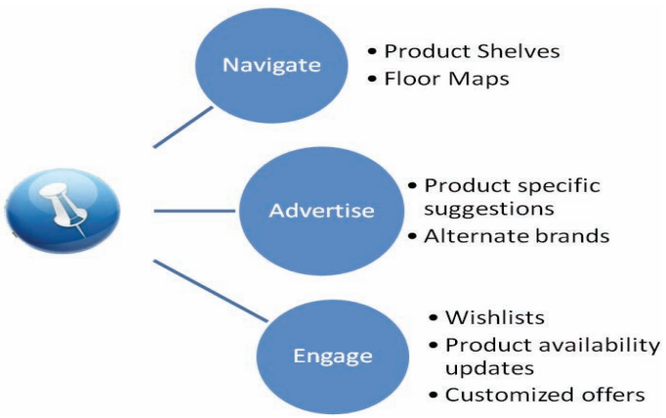
- Uncertainty on the availability of the product: The customer may get irritated to see that the product he/she is looking for is out of stock or is available in a quantity less than needed. This will lead the consumer to shift loyalty to another retail outlet.
- Lack of Knowledge on the arrival of the stock: The consumer once returned home without purchasing might want to wait to purchase the desired product .Lack of knowledge on the time of arrival of the desired product will also discourage the customer to visit the stores
- Challenge of retaining the customer base: A disgruntled customer will definitely not want to continue his association because of the issues mentioned above

In addition to this, these supermarkets will however have large parking facilities and the motorists find it daunting to locate their vehicle parking spot even after implementation of numbering mechanism.

4. Approach Towards the Solution

The pain points mentioned above have to be eliminated by every organized retailer. With the increased usage of Smartphones by people in urban setup, the field of mobile communications can be handy in solving the identified issues. The solution that is going to be proposed will also help in minimizing the operating expenses (Op-Ex).

Figure 1 Functionalities of the Proposed Solution



The retail sector is at a stage where the business models are inclined towards more automation to reduce the Op-Ex. Consider a scenario where the customer is assisted with by an interactive response/smart guide on his/her smart phone on how to navigate through the blueprint/ floor plan of the shop. The figure given below will give an overview of how the LBS can be improving the shopping experience in the discussed shopping model.

The *smart guide* thus implemented will result in limiting the operating expenses to the retailer. The staff overhead count can be minimized as the number of staff deployed with reference to floor space will come down. Hence, the *smart guide* will minimize both the customer facing and the non-customer facing staff which improves the net profit margin. Also the automation allows better inventory management and accurate forecasting , improved conversion rate of footfall and there by optimizing the occupancy costs, understanding the shopping trends of the customer and there by delighting the customer with the suitable coupons/ offers, etc.

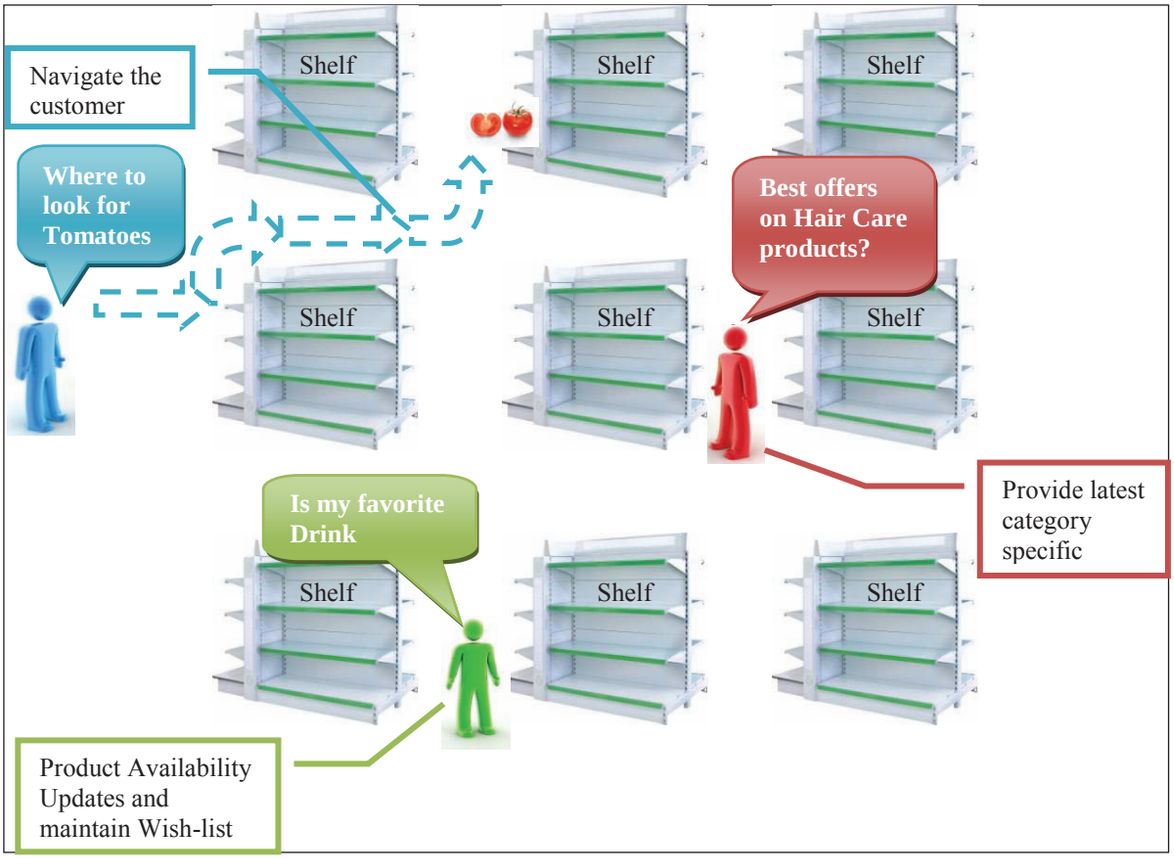
5. Technical Feasibility of the Solution

Indoor navigation is bit more complicated than outdoor navigation. Global Positioning System (GPS) which comes inbuilt with majority of the current generation mobile phones will not be accurate enough with indoor navigation. In GPS satellite navigation system, microwave signals are transmitted by the GPS satellites and based on the arrival time of signal the positional coordinates of the GPS enabled mobile devices are identified. Positioning using GPS will be accurate on when there is direct/sky line of sight from at least three GPS satellites.

These microwave signals cannot penetrate in the building interiors and hence accurate positioning of the device is difficult. Hence for indoor navigation Wi-Fi enabled beacons can be used to identify the device positional coordinates. The access points in the building will listen to the mobile phone and identify the location based on the method of Trilateration. Simple speed calculation and basic geometry explains this Trilateration technique of location identification. The distance between one access point and your phone can be obtained based on the arrival time of the signal. Similarly the distance between the phone and two other access points is obtained. The point of intersection of these three spheres will determine the positional coordinates of the phone.

Another important point for retailers to consider is the choice of channel to communicate with the consumer. It should not seem to be intruding the shopping experience of the consumer while at the same time providing him with innovative ways to discover the shop floor. SMS over the time have been vastly used by marketers to promote products and features. Thus consumers may feel them to be useless at time and may not value the information

Figure 2: In Store Navigation



communicated.

USSD which is a more engaging way of involving the consumer and recording their responses immediately can be a perfect channel for the retailers. The flash message which seems to interest the consumer can encourage him to further select options and use the information correctly.

Social networking sites provide consumers with unique way to communicate about what products to go for, the latest options, and feedback about brands. This makes it a must for retailers to utilize this channel. If they can link the custom applications with options that let the consumers engage on this social network websites then it provides retailers an opportunity with increased visibility and chances to attract new customer base.

6. Proposed Solution

Indoor LBS has provided retailers with opportunity to create unique intelligent environment for shoppers. The eco-system will have Wi-Fi Access points, RFID tagged Shelves/Products, navigation specific apps, shop floor maps and smart devices.

Through a defined set of applications specific to navigation, engagement and customer relationship management, retailers can ensure that customers will have reason to come back to their store for shopping. The following image displays the features and capabilities the app possess

This experience should not be limited to customers handling Wi-Fi or GPRS enabled handsets. To ensure this, the location detection should not be limited to a single technique but overlap of multiple options available. As a retailer it may not be feasible to have the initial solution cover entire customer base hence starting with local Wi-Fi location detection to enable them to measure the impact on shopping experience of customers.

Smartphones with GPS support will enable the customers to avail maximum benefit by real time navigation to the products (Martin, 2010). A simple Floor Layout map can guide the customer throughout the store. A consumer can

Figure 3: USSD Menus

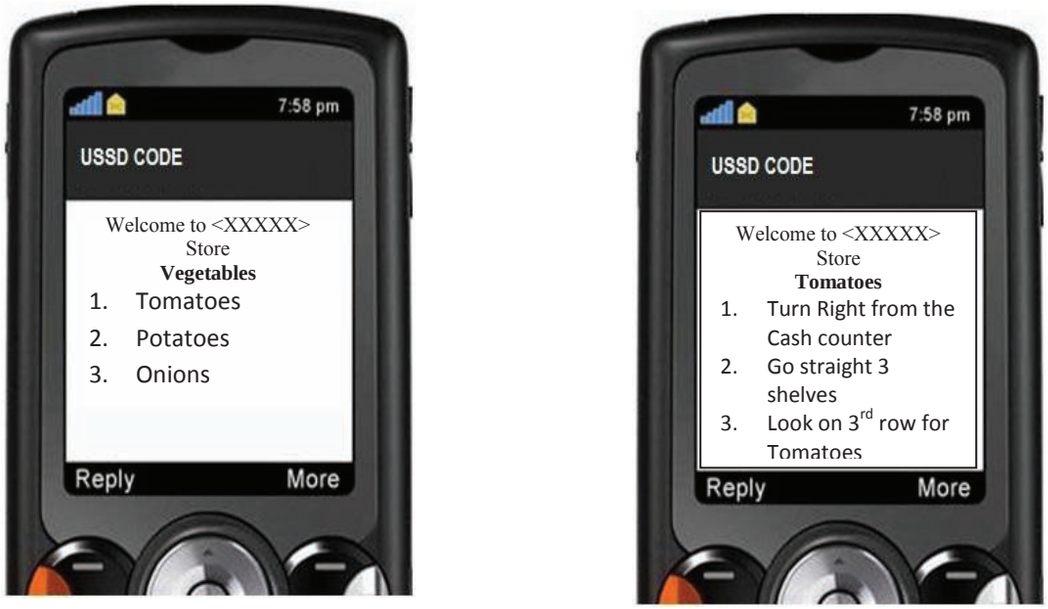
check if any friends are also visiting the store and can interact before making any purchase decision.

As important is the other aspect of delivery channel to customer and it should also be a mix of SMS, Flash Messages and USSD Menus. USSD will create a perfect combination with LBS to provide particular applications to customers which will not be forced on them or seem to intrude their time in store.

The following images show how a simple interactive USSD menu containing basic options can guide the customer as per his/her requirements:

A look at the menu options show how the user can interact with the USSD system and get directions to reach the right shelves. Although this service does not adjust to the real time positional coordinates of the mobile devise, it

Figure 4: Shelf Locator using USSD Menu



still can direct the customer from a fixed point/location.

The below image shows how USSD menu can assist in locating the tomatoes shelf using the cash counter as a refernce point.Despite the limitations on positional coordinates this service can still engage the customers to a certain extent and assist in locating the required goods.

7. Retailer Benefits

- Directing the customers to the right shelf's- Firstly, the customer of today will prefer smart navigation tools to find the shelves instead of taking instructions from some individual, particularly in a large shopping space. So by using the technique of Trilateration the real time position of the devise with respect to a product shelf can be obtained. Most importantly, this smart navigation technique will save lot of time to the customer and minimizes human effort to the seller/vendor (Sheldon, 2011)
- Responding to the queries and providing an alternative including special offers-Customer stickiness is key factor for sustainability of any business/sector. Suggesting the customer about special offers and assisting with possible alternates for the desired product will improve the customer stickiness.
- Enables the customers to create wish lists and hence provide customized alerts- Customized alerts on arrival of wish list items/products will help the customer in making his/her purchases more efficiently which in turn will enhance the customer experience.

8. Challenges

The technological feasibility and utilities attained from implementing Location Based Service to enhance the customer shopping experience has been discussed in detail in the previous sections. But, the glass is not full if the challenges faced in implementing these services are not discussed in this white paper. The retail sector must overcome the following potential problems to benefit from the technological advancements.

- Precision to an extent of close to a feet is to be achieved
- For Unpackaged goods like vegetables a portion of the *Smart Guide* functionality like suggestions on substitutes, availability, etc. is not applicable because of the complexity involved in quantifying the stocks.
- If customers are not technology savvy people then utility levels of these services will drop.
- The positional coordinate's capture of the user location might raise privacy issues.
- The LBS based applications and Wi-Fi network beacons should not be too intrusive and disturb the primary utilities of the customer mobile.
- Another major concern is the commercialization of consumer purchase patterns which needs to be

addressed for wide acceptances of these services from the customers.

- Finally the security of user's personal data and account information needs high priority.

9. Conclusion

Thus, this paper emphasized on how to leverage the advancements in telecommunications field to improve the shopping experience in large spaces. In order to achieve this, the eco system needs to be strengthened in a way that this implementation is sustainable in the longer run.

Thus, the digital shopping environment with help of LBS can provide exciting shopping experience to the consumers in the future. This implementation of LBS for retailers will provide them with a tool to differentiate their services and provide additional value to consumers. It also provides retailers to efficiently utilize social networks to be used as a marketing tool. Even if they are not very familiar with digital marketing this provides them with an opportunity to explore and understand this medium. This is the perfect link to the future where customers are going to be fully dependent on mobiles, tablets and other smart devices to manage their daily shopping requirements.

10. Epilogue

Thus, this paper emphasized on how to leverage the advancements in telecommunications field

This implementation can be extended beyond retail sector and can span across several other sectors. The following is the list of such extensions

- Customer Profiles if linked to their respective device/smart phone, with the use of *Big Data analytics and Infrastructure* can understand the shopping pattern and can provide the customer with coupons and promotions instantaneously (Dijcks, 2012).
- Updating the customer with the product availability-When the customer can check the vendor can meet his requirement in terms of quantity and quality in advance then the customer can plan his/her purchases accordingly.
- In addition, this mechanism of smart navigation can also be applied in various locations. Possible sites for replication of similar services includes
- University Campus
- Trade fairs
- Zoo
- Museum
- Locate your vehicle- Another possible extension could be, tagging /pinning the vehicle location in the map will help in tracking the vehicle easily .This implementation is particularly beneficial in large parking lots.
- The shopping carts in the hypermarkets can also be fitted with a small charging point at top and also the same cart can act as a Wi-Fi access point to track the customer real time positional coordinates if he/she is not carrying a Wi-Fi or GPS enabled smart phone.

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