



International Journal of Engineering, Business and Enterprise Applications (IJEBA)

www.iasir.net

Improving Online Retail Effectiveness through Business Intelligence

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Abstract: Information technology can be used as an effective tool in managing problems related to the online retail business. In this paper, some of the common challenges retailers' face as well as technology solutions for the same have been discussed. Many small online retailers and new entrants to the online retail sector are keen to practice data mining and consumer-centric marketing in their businesses to excel the ever-changing online business. With the evolution of digital mediums, consumers are becoming increasingly sophisticated, connected and have high expectations of the retail experience. In order to keep up with increasingly sophisticated consumers, retailers need to adopt a consumer adaptive retailing approach. This research paper focuses on the key challenges facing the online retail industry and the use of data mining techniques in customer-centric business intelligence for online retailers. Some aspects of Flipkart, the online Indian giant have also been discussed with regard to the online retailing challenges.

Keywords: Online retailing, Information technology, business intelligence, data mining.

I. Introduction

It has been said that, "shopping online no longer exists. It's just shopping". Compared with traditional shopping in retail stores, online shopping has some unique characteristics: each customer's shopping process and activities can be tracked instantaneously and accurately, each customer's order is usually associated with a delivery address and a billing address, and each customer has an online store account with essential contact and payment information. These desirable, special online shopping characteristics have enabled online retailers to treat each customer as an individual with personalized understanding of each customer and to build upon customer-centric business intelligence.

For the past 10-15 years, we have witnessed a steady and strong increase of online retail sales. Figure 1 shows the share of online market in India. The online sales have remarkably increased in past few years. Online Shopping in India is evolving fast and has the prospective to grow exponentially in the times to come, as the internet penetration and payment options have increased. India's e-commerce market grew at a staggering 88% in 2013 to \$ 16 billion, riding on booming online retail trends and defying slower economic growth and spiraling inflation, according to a survey by industry body Assocham [11]. India is likely to be the world's largest consumer market by 2030, according to a report by global consultancy Deloitte [13].

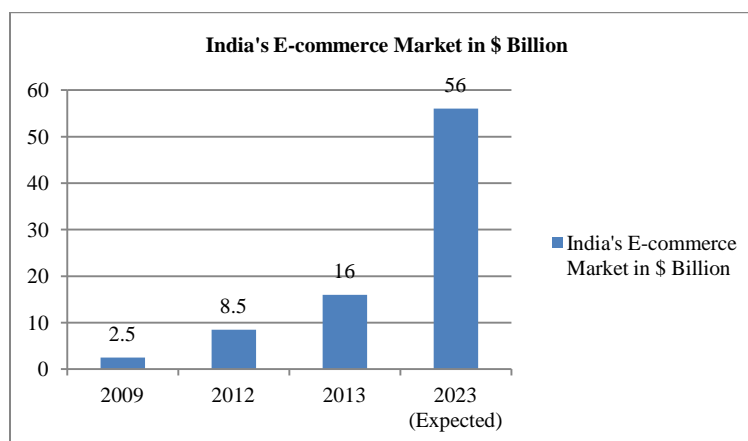


Figure 1: India's Online Retail Sales Data and Weighted E-commerce Market Share.

At the global level there are other countries whose online turnover is much higher such as China online retail sales passed \$ 300 billion and USA reached \$ 262 billion. To bring India at par with other countries while viewing its population, the sector of online retailing needs to be analyzed. Approximately 97% of people who visit an e-Commerce site leave without buying anything. Many online retailers never take into account the unique personality traits or varying shopping behaviors of the people who actually visit their site. They view all shoppers through one conversion funnel and present all of them with identical promotions and discounts without knowing which exact offer will actually incentivize each to buy. Retailers need to have a way to segment shoppers based on observed buying behaviors and shopping personalities, then deliver unique messaging targeted to those individual groups.

This research paper has focused on the use of business intelligence techniques for online retail brands to stay competitive in the cyber market. Collecting data is great, but if you don't have the means to analyze the data in an efficient and timely way, you lose the value of the data. When you're marketing to people online you must be able to observe, understand, and react to decisions they're making in real time so that you are able to capture the sale before they navigate off-site to a competitor. e-Commerce marketers are often unable to find out where their online ads are running because tech partners are trying to protect their own margins. Utilize a platform that is able to both access important site activity and behavioral data, and also launch marketing campaigns in real time. This paper also focuses on the India based online retailer Flipkart who have grown from the investment of just four lakhs rupees to a \$100 million-revenue online retail giant in just five years. The next section also discusses how Flipkart is meeting the key challenges and making the difference in online India retailing business.

II. Business Intelligence and Challenges in Retailing

This section outlines the major challenges facing online retailers looking to address customer service and support: The customers' expectations of a consistent shopping experience have changed due to rise of the Omnichannel. The connected customer expects to be able to shop how, when and where they want to – not how you want them to. The retailers have to form a good perception of the customer at the first encounter with your online shopping channel. Along with this, it looks at how a unified help and support strategy can cut costs, reduce basket abandonment and increase sales per customer.

Business Intelligence (BI) refers to the ability to collect and analyze huge amount of data pertaining to the customers, vendors, markets, internal processes, and the business environment. Data mining techniques are the processes designed to identify and interpret data for the purpose of understanding and deducing actionable trends and designing strategies based on those trends [3]. For many online retailers at international level, especially the leading companies including Amazon, Walmart, Tesco, Sainsbury's, Argos, Marks and Spencer, John Lewis, and EasyJet, data mining is becoming a common practice and an integral part of the business processes in creating customer-centric business intelligence and supporting customer-centric marketing. Given their greater access to the big data generated by the customers and the analytical tools, retailers are finding information technology as an answer to increasingly complex questions pertaining to retail strategy and operations—for themselves as well as their customers, suppliers, and other partners. In relation to customer-centric business intelligence, online retailers are usually concerned with the following common business concerns:

- Which items/products' web pages has a customer visited? How long has a customer stayed with each web page, and in which sequence has a customer visited a set of products' web pages?
- Who are the most/least valuable customers to the business? What are the distinct characteristics of them?
- Who are the most/least loyal customers, and how are they characterized?
- What are customers' purchase behaviour patterns? Which products/items have customers purchased together often? In which sequence the products have been purchased?
- Which types of customers are more likely to respond to a certain promotion mailing? and
- What are the sales patterns in terms of various perspectives such as products/items, regions and time (weekly, monthly, quarterly, yearly and seasonally), and so on?

Smart retailers have reoriented their business around the customer. In the mad rush to acquire new customers, they have realized it is equally important to retain the existing ones. Increased interaction and sophisticated analysis techniques have given retailers unprecedented access to the mind of the customer; and they are using this to develop one-to-one relation with the customer, design marketing and promotion campaigns, optimize store-layout, and manage e-commerce operations. The challenges facing Retail Industry as well as business intelligence solutions for the same can be categorized as follows:

A. Omnichannel Customer

Today's customers are not just already omnichannel, but smartphones have completely changed their behavior and expectations (Figure 2). With customers buying across multiple screens and channels to suit their specific goals each

time, a seamless, consistent shopping experience is essential – from the way each channel looks, to the technology used to power them – customers must be free to choose their own route through your website, and feel as if it is all one cohesive brand. Consumers now expect to engage at any time and from anywhere with your brand. They expect to engage before, during and after transactions with your brand. If your brand does not have omnichannel initiatives already working, then your brand is behind. Secondly, online retailers must service each channel in line with the customers' expectations; and only offer those channels they can manage accordingly.



Figure 2: Statistics showing omnichannel customer's shopping behaviour.

Since the mid-1990's multiple companies have entered the online retail market. Few have survived. What is it about e-retailing that make them fail? What makes them succeed? What can we learn from yesterday's experience that will enable the new players to stay afloat? With online retailing, industries collect huge amounts of data on sales, customers, shopping history, goods transportation, consumption and service. This facilitates the design and construction of data warehouse based on this wide spectrum of data. Data mining techniques can do multidimensional analysis of sales, customers, products, time and region to design sales campaign and customer attraction strategies.

The information economy puts a premium on high quality actionable information. The power of information can go a long way to support management and marketing decisions. Customer relationship management helps companies improve the profitability of their interactions with customers while at the same time making the interactions appear friendlier through individualisation. To succeed with CRM, companies need to match products and campaigns to prospects and customers i.e. to intelligently manage the customer life cycle. "With omnichannel retailing, marketing can be made more efficient with offers that are relative to a specific consumer determined by purchase patterns, social network affinities, Web site visits, loyalty programs, and other data mining techniques." By applying association rule mining technique, the site manager analyzes the different items purchased by the customer in a single purchase, and tries to find out association rules among them to make "One-to-One" marketing a reality for online business. The deep mining of customers shopping behaviour can enable the online retailer to change the looks, experience, technology and feel of the site to make it a cohesive one for the customers.

Flipkart.com is a successful Indian e-commerce startup company based out of Bangalore. Flipkart has raised the biggest round of funding at \$7b in July 2014, setting the stage for a battle with other top players for supremacy of online retail market. It provides a great online shopping experience with clean user interface and simple ordering & payment mechanism. Prompt delivery and discounts are few more reasons. Flipkart provides an Android app that offers users the ability to browse and purchase from smart phones. The success behind this online giant is hidden in the use of technology which ensures to excel in the online shopping experience to the customers.

B. Customer Experience

As the old saying goes, you never get a second chance to make a first impression. This is as true for your website as it is for meeting people. The experience they receive the first time they visit your site will inform all their future decisions about shopping with you. Around half of your site visitors will go directly to the search box on your website, entering terms they think will find what they are looking for. If the search does not deliver or delivers garbage results, you will probably lose the customer to another retailer. At this point, bear in mind that

- (a) the terms your customers use may be completely different o the terms you have indexed your site with; and
- (b) customers will not put effort into trying to second-guess your terminology or into sorting through dozens of irrelevant so-called "search results".

56% of people say that a lack of information online is the reason they leave a website. You need a search functionality that can learn and adapt, understanding that when a customer searches for xyz, that that is also the

same as abc, but not def. Data mining learning tools help here to read the mind of the customers to deliver them the right information. Sifting in the huge online-click database, a data mining tool is able to find the expectations of each customer and present you an opportunity to prove up to that and retain the customer. However, you will have a core of customers who choose to contact you rather than search, and you should remember that they will choose the communication channel that suits them, whether that's phone, live chat or email. You have to let your customer access their preferred channel if you want to retain their business – forcing them into the contact strategy that only suits you is not a long-term money maker.

Flipkart has 22 million registered users and handles 5 million shipments every month. The focus at Flipkart is to continue to make shopping online simpler and more accessible through the use of technology. The online retailer has made it mandatory for all top executives including directors to spend one day a month handling customer calls. Understanding the customers' expectations is the key to success. Data analyzing tools such as, customer segmentation through clustering, help proper customer understanding and action ability lead to increased customer lifetime value. Improper customer understanding can lead to catastrophic actions. A customer can be a user, purchaser, influence maker etc. Therefore the transaction data query may have different types of inquiries, which include suggestions, queries, requisitions, and reclamations. It is important to understand each customer and take action accordingly to stand you ahead of your competitors.

C. *Big Data*

Most marketers understand the value of collecting transaction data, but also realize the challenges of leveraging this knowledge to create intelligent, proactive pathways back to the customer (figure 3). Data mining methods such as neural networks and decision trees for recognizing and tracking patterns within data, help businesses sift through layers of seemingly unrelated data for meaningful relationships, where they can anticipate, rather than simply react to, customer needs. Analysts seeking new insights from massive databases of click data and similar market information can now accelerate their development of customized data mining applications by using various latest tools and techniques as building blocks for their applications.

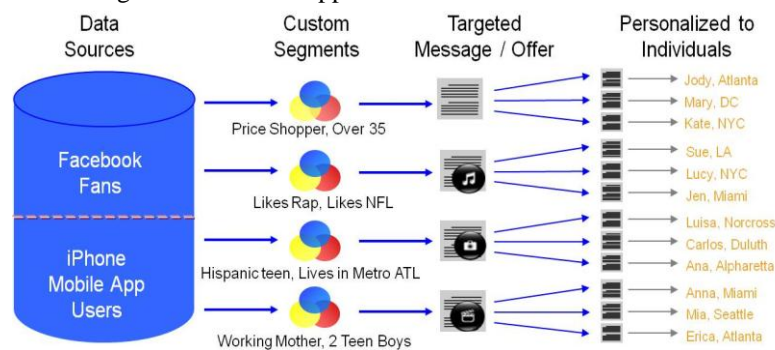


Figure 3: Process of converting Big Data into proactive pathways to the customers.

Web analytics tools can give you all manner of cold, hard statistics about your site in the form of clickstreams, customer registration attributes and order transactions; all of which are useful and have a place in technical website optimization. But the picture is incomplete without the far more useful qualitative opinions, thoughts and real questions asked by your customers. And accessing and understanding this level of deeply personal insight means you will be able to create the most engaging and relevant website experience possible, based on actual customer behaviour. Much as if you asked an in-store assistant for a specific item, big data analysis can help you identify exactly what your customer is after, and retrieve that exact item, not something unrelated. Returning a customer's search with the result that matches their exact request wording is a surefire way to increase engagement and propensity to buy.

Fuzzy logic and neural network data mining techniques can work on such real and behavioural data, because of its ability to handle multiple data types (dates, hierarchical attributes, and different granularity data). The findings are comprehensible for business insight. The Indian online retail Giant Flipkart has proved its strength by constantly working on advanced information-retrieval algorithms, massive scalability, elastic storage, predictive analytics, fraud detection and large-scale applications to get useful information from web data and use the same to enrich the user experience.

D. *Campaign/ Promotion Effectiveness*

Another challenge before online retailers is to launch a promotion campaign effectively. Once a campaign is launched its effectiveness can be studied across different media and in terms of costs and benefits; this greatly helps

in understanding what goes into a successful marketing campaign. Campaign/ promotion effectiveness analysis can answer questions like:

- Which media channels have been most successful for various campaigns?
- Which geographic locations responded well to a particular campaign?
- What were the relative costs and benefits of this campaign?
- Which customer segments responded to the campaign?

A call-to-action describes the part of the email message that asks readers to take an action that fulfills the goal of a promotional email. It should be persuasive and compel readers to perform a conversion, such as finalize a purchase, subscribe to your email list, click through to a landing page and so. The click-through rate is the percentage of recipients who click on a certain URL in your email and is a good measure of the effectiveness of your calls to action. Table 1 shows an example call-to-action promotional campaign effectiveness.

Call-to-action	Clicks
Links to 'Offer on Apparel'	4,00,000
Links to 'Offers on Footwear'	1,50,000
Links to 'Offers on Watches'	3,50,000

Table 1: Performance of Call-to-action link (Example).

At the end of the day, what marketers look for is return on investment and ads that push the envelope to bring in positive changes in the marketplace. Whichever is the brand and whatever be its budget, as marketers, we know that there will always be a high deliverable attached to cost. Web retailers have to create winning ideas and then find ways to reach out the brand message, cost effectively, with an impact on the customer's heart and wallet. Success rate of creative campaigns increase if they are based on certain past statistics. Association rules are like classification criteria which aim at building a model to predict future customer behaviours through classifying database records into a number of predefined classes based on certain criteria. Flipkart campaign is one such example. It succeeded in increasing monthly revenues for the brand by 100% - from Rs 30 crore to Rs 60 crore per month. Items shipped went up from 14,000 to 30,000 per day during and post the campaign (114% increase). Moreover, the brand flipkart.com ranked 10th in the awareness quotient of 'retailers of electronics, gadgets and home appliances' in a list of physical and online retailers [14].

E. Customer Loyalty

There has been a revolution during the last three decades in the retail Industry. The retail market has changed from a product-oriented industry to a more market-oriented to the service and experience oriented, with the customer as the core of their operations. This customer centricity has been the outcome of the hyper competition in the retail markets, and every retailer is doing their best to woo the customers from other retailers. This phenomenon has resulted in the maximization of the customer focus and the path towards bringing in the customer delight, just not the satisfaction.

Business Intelligence helps in understanding customer attrition with respect to various factors influencing a customer and at times one can drill down to individual transactions, which might have resulted in up-sell and cross-sell to the existing customers at lower cost than attracting the new ones. As an outcome, companies have started to launch customer loyalty programs to bond the customers for long time while making profit through them. Working with customer care the company hopes to create satisfied and loyal customers. Under the loyalty program companies are offering different kind of benefits to the customer. Gift cards, frequent purchase program, point program, rewards, offers, schemes, value added services etc. are lucrative content of loyalty programs.

Flipkart, the online retailer, have a loyalty plans system in place. It is also a great tool to influence customer behaviour and guide them to new product and service offerings. Flipkart has launched Flipkart First, a seemingly innocuous subscription service for its customers. The subscription policies are simple enough – you pay INR 500/- per annum and in return, receive free shipping of orders, ensure in-a-day guaranteed delivery, get 50% off on same day delivery and get priority customer care. This subscription service is nothing but a 'customer loyalty program' modified for e-commerce. There are other examples of customer loyalty programs such as frequent flyer programs of airlines, or a discount card for Lifestyle or Big Bazaar. In those industries, you either end up getting points which can be redeemed for other products, or you get to use the points as a discount on your next purchase. But in e-commerce, where the buying patterns are very different and the margins are wafer thin, the companies cannot afford to give away money or points.

There are other indirect reasons why they have started this program. Deeper customer data can be obtained than is possible from a normal registered user. Further, many users simply check out as guests without bothering to register. This brings even those users into the loop, providing better insights into buying behavior.

III. What next for online retailers?

Businesses that can cater to the requirements of India's ambitious middle class, keep prices reasonable, build brand loyalty in new consumers, and adapt to a rapidly changing environment will find tremendous rewards in India's potential-filled consumer market. With the online medium of retail gaining more and more acceptance, there is a tremendous growth opportunity for companies (international and domestic) in the online retail sector. To stay competitive in the online scenario, you have to do real time analysis of the online stores and make your channel a step ahead of the others. Business intelligence has the ability to translate business questions to the desired data transformations.

As customers and businesses interact more frequently, businesses will have to leverage on BI and related technologies to capture and analyze massive amounts of customer information. Businesses that use customer data and personal information resources effectively will have an advantage in becoming successful. However, businesses must also bear in mind that they have to use technology responsibly in order to achieve a balance between privacy rights and economic benefits. Application of data mining techniques for organized Retail Industry is an emerging trend in the global economy which has attracted the attention of practitioners and academics. Indeed, on-line shopping is now estimated to be the fastest growing area of Internet usage.

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