

**OVERCOMING THE CHALLENGES AND
REALIZING THE POTENTIAL OF RETAIL
ANALYTICS FOR NEXT GENERATION SMART
RETAIL BUSINESS**

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ABSTRACT

The retail landscape in India is changing rapidly and is being scrutinized by large scale investments by foreign and domestic players. A still-turbulent economy, new marketing channels, advanced digital technologies, and increasingly demanding consumers all challenge retailers to find new ways of remaining competitive. The purchasing decision journey for consumers involves multiple steps, many of which are now being captured, digitized, and transformed into metrics and data. As this data becomes an implied derivative of essential retail and consumer technologies, the focus is shifting from how to acquire the data to how to extract insights from it - findings that can be turned into differentiation and competitive advantage for the retailer and a better shopper experience for the consumer. Indian retailing is growing fast and impacting the consumer preferences across the country. There is no doubt that business analytics is providing concrete value to thousands of organizations around the world. Also, India seems to play an important role in propagating analytics and data science as disciplines around the world. Currently we are seeing a quicker adoption of analytics and consequently, a huge demand for companies that provide these services. This article is based on an exploratory study on the scope and challenges in retail analytics in India.

Keywords: *Big Data, Business Analytics, Indian Retail Industry, Retail Analytics, Retail Marketing*

I.INTRODUCTION

Thomas Friedman in his 2007 book, "The World is Flat," suggests that globalization is creating a level playing field on which a wide variety of competitors have an equal chance at success.¹ Today's consumers are encountering an evolving multi-channel environment in which an increasing number of shopping opportunities are leading to what is called as "flat retailing" experiences. Few industries are changing more rapidly than today's retail sector. Market liberalization and changing consumer behaviour have sown the seeds of a retail transformation. Today retailing is the largest contributing sector to India's GDP i.e. 10% as compared to 8% in China, 6% in Brazil. Modern retailing is capable of generating employment opportunities for 2.5 million people by 2010 in various retail operations and over 10 million additional workforces in retail support activities.

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Organised retail which presently account for only 4-6 percent of the total market is likely to increase its share to over 40% by 2018.ⁱⁱIt offers huge potential for growth in coming years. As a result, India is becoming the most favoured retail destination in the world.

Analytics are driving the move from merchant-driven business models - where the product is the differentiator - to digital models, where every decision is informed by data. Brand engagements are becoming more closely aligned with individual shopper preferences, creating a brand relationship that is shifting from a “nice to have,” time-sensitive offer-based relationship to a “must have” digital companionship based on deep insights and understanding of the consumer. To achieve this critical differentiation, retailers are depending less on increasingly shorter product cycles and more on the enduring differentiators of relationship and customer experience created through strategic use of data and analytics.ⁱⁱⁱ

Companies increasingly understand that their ability to compete depends on their ability to create and harness value from data, and are seeking new ways to look at big data and beyond. According to a study conducted by Analytics India Magazine, more than 2,500 companies in India claim to provide analytics as an offering to their customers. This includes a small number of companies into products and a larger chunk offering either offshore, recruitment and training services.^{iv}There is growth rate of almost 27% year over year in the number of analytics companies in India from last year. The number of analytics companies in India are still very few in number, compared to the strength of analytics companies around the globe.^v In fact, India accounts for just 4.9% of global analytics companies. The business is seeing fast development driven by expanded demand for cloud-based and prescient analytic arrangements by industries, for example, BFSI, retail, telecom and social insurance. India has 600 analytic data firms with 100 new businesses setup in 2015 alone.^{vi} Taking into account this demand would require a huge supply of data researchers. As per Team Lease Services – a staffing arrangements company – by 2020, India will confront a demand-supply hole of 2,00,000 analytic data experts due to their target of improving the future of data analysis in their country.^{vii}

II. ROLE OF BIG DATA AND ANALYTICS

Retailers can benefit immensely from a structured analytics-driven approach that will help them understand how their customers are using their products and services, how their operations and supply chain are performing, how to manage their workforce and how to identify key risks - insights that they then can then act upon, according to a report titled “Driving retail growth by leveraging analytics” by PricewaterhouseCoopers (PwC) and the Retailers Association of India (RAI).^{viii}Data science and analysis allows retailers to collect and fuse data from multiple customer touch points such as web, store, social media, and call centers. Cutting-edge technologies combine these with metrics from previously analog components such as carts, doors, machines, and merchandise. Operationalizing the use of this data across business processes now becomes a more practical proposition, with reliable, automated methods of producing and collecting data across large populations of people and devices.

The use of data to inform decision-making is of course not a new concept. What is new is that through Internet of Things (IoT) technologies, retail data can finally be extracted in ways that make it reliable for use in managing

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large-scale retail businesses. Omni-channel retailing is the new normal of retail. With online and mobile sales growing faster than storesales, consumer spending is shifting towards online or online-aided sales. Online, mobile and social channels also represent disciplines with the highest rate of growth of consumer-generated data.

Omni-channel analytics presents an opportunity for retailers to understand growing activity in this strategically important area of the business. They must do so by tapping into a growing mass of consumer data, while at the same time integrating these relatively newer data sources with existing enterprise data. Omni-channel ranks highest among business functions in terms of retailers' planned technology investments in analytics, as per the Retail Industry Research conducted by EKN.^{ix} Investments will focus on improving Omni-channel analytics maturity, as among the various retail business functions, retailers rated it lowest in terms of leveraging analytics strategically. Retailers need to move from e-Commerce analytics to Omni-channel analytics, i.e. assessing the effectiveness of channels in concert with each other rather than in silos, and identifying cross-channel, rather than channel specific, consumer behaviour trends and patterns.

In addition, at the lower end of the maturity spectrum, retailers conduct basic operational analytics with goals such as Search Engine Optimization (SEO). The future of Omni-channel analytics is in strategic analysis of performance metrics such as customer loyalty, customer value and channel performance. For such data to be useful it must meet four key criteria. It must be accurate, affordable, scalable (all afforded by the evolution of key technologies), and finally it must be actionable.

- *Accurate*: Automating the creation and collection of shopper behavior data in a natural retail environment produces more consistent, quantified, and accurate data, reducing variation and errors from manual observation and point-of-view reporting.
- *Affordable*: Data automatically generated from existing technology platforms measuring every shopper, every day provides an affordable way to acquire large amounts of data in a non-invasive manner.
- *Scalable*: Platforms such as mobile, video, web, and social can be implemented and data easily accessed, allowing the scale necessary for retailers to reach and measure every shopper in every store.
- *Actionable*: Capabilities for alerting, setting thresholds and performance markers, along with collaboration tools for instant sharing and engagement, make the data actionable in real time.

Retailers in turn must commit to using the data to make business decisions - a pivotal cultural change that sounds easier than it sometimes is to accomplish. Understandably, retailers are focusing on metrics that reflect and impact the customer journey. Such analytics are essential for creating differentiation, as they provide insights into how and why shoppers make the decisions they make along their path to purchase. Metrics generated from mobile, video, web, and social media help to improve shopper marketing as well as operations.

Metrics can be gathered using a wide variety of sensors and devices, including smartphones, Bluetooth beacons, weight and motion sensors, counting systems, active RFID (Radio-frequency identification) tags, and even ambient condition sensors for moisture, weather, and temperature. The most advanced analytics systems

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can integrate data streams from these types of sources with business information systems, merging workforce information, POS (Point of Sale) transactions, loyalty, and subscription data. Ultimately, seamless sharing and access to all these different types of information is the key to creating adoption and delivering business value.^x

Strategies that consider real-time collaboration tools as part of the data value equation, deliver complete systems to their users, hence facilitating the insights-to-action value proposition.

Shopper Behavior Metrics / Insights	Operational Metrics / Insights
<ul style="list-style-type: none">• Traffic (entrance, aisle, endcaps, departments)• Unique visits, repeat visits• Associated/unassociated devices• Path metrics• Photo pins/repin activity metrics• Dwell times and events• Queue metrics (number in queue, wait times, abandonment, behaviors in queue)• Gender metrics• Kinetic heat maps• Behavioral data visualization• Facial detection/recognition• Basket metrics (IPT, ATV)• Conversion analysis for promotions/tactics• Social sentiment/influence• Conversion (store, aisle, category, SKU)• Check-in/opt-in rates	<ul style="list-style-type: none">• Point-of-sale analysis and transaction attributes• Staff productivity metrics• Engagement rates• On-shelf availability – out of stocks/replenishment• Shelf activity/item movement• Sweeps and risk management• Asset tracking (carts, fixtures)• Energy use analytics (lighting, HVAC)• Space analysis metrics (hot spots/cold spots)• Wi-Fi service utilization/ interference• Repair, replacement warnings• Queue metrics• Conversion analysis for operational variables

(Source: Cisco White Paper on Big Data, 2014)^{xi}

Information gathered from in-store and online activity can also be augmented by opt-in social media monitoring and location-aware mobile analytics. Participating customers using mobile networks and social media from the store, or showroom, at the same time identify their influencers, relevant demographics, likes, dislikes, and preferences, allowing stores to capitalize on this often-dreaded practice. Based on the fusion of this data, a map can be automatically created to help location-aware systems deliver contextual content. Such messages may promote products, offer timely price matches, or drive related product awareness to encourage upsell as the customer moves throughout the store.^{xii}

III. RETAIL ANALYTICS IN THE REAL WORLD

The applied uses of analytics to real-world decision making are numerous, and many retail industry leaders are achieving value with innovative new approaches. A few recent examples include:

- Specialty retailers using video analytics to study customer paths and behavior, helping them to design more effective store layouts

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- Big Box retailers investing in Wi-Fi networking and new mobile way-finding apps to help customers navigate through large stores or malls, getting them to desired products faster
- Resorts and hotels investing in mobile analytics to gather shopper information from their retail spaces
- Mall operators using the network to track social media and shopping patterns, and delivering this value-added information to tenants
- Grocery and fast-moving goods retailers utilizing video analytics for traffic and conversion analysis, and then using the same information to integrate workforce management and re-align staffing based on traffic trends
- Specialty retailers using social sentiment analytics to improve “voice of the customer” feedback to assess overall brand status and the launch of new products, services, or offers.

Further, with the analytics tools, retailers can:

- Identify their most profitable target customer base through customer segmentation and profiling.
- Develop close relationships with customers based on a deep understanding of their behaviors, predicting future behavior and identifying their needs.
- Deliver targeted advertising, promotions and product offers to customers that meet their individual needs and motivate them to buy.
- Tailor pricing strategies that provide competitive prices while maintaining profit margins.
- Maximize marketing investments and allocation across various media and marketing channels^{xiii}

However, the main challenge of big data is just that - it's big. Massive amounts of structured and unstructured information are piling up in retailer and supplier data warehouses. Customer metrics derived from video and other sensors, social media, call centers, and mobile devices have the power to provide unprecedented insight into the purchase decision process.

IV. CHALLENGES FACED BY RETAIL ANALYTICS

The challenge most retailers face is in extracting insights from the huge volumes of data generated through multiple channels. Analytics, backed by robust data management, has the capability of digging into these mountains of data, too gigantic now for any human effort, and of unearthing patterns invisible to the statistically-unaided eye. Gartner's Robert Hetu says, “But this breaks down when a broad range of customer contextual data enters the picture. Retailers are really good at understanding products, but not at understanding customers.”^{xiv}

One major issue regarding analytics is that retailers may feel as if there are too many analytical options to explore. The breadth of analytical processes and applications suggests that retailers need to selectively target investments in analytics based on their strategies and industry positions. In a difficult economy, retailers may also need to adopt first those analytical applications that have saved money for other adopters, including pricing and assortment optimization.

Some of the major stumbling blocks for retail business while executing real-time analytics are

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- *Data identification*: Data classification is the essential step of the planning phase. To begin with, you must take one project at a time. Once accomplished, you can get an idea of the success rate and jump to the next project. You will also have the knowledge of what to include in the data and what provides you more customized information crucial to growing your business. This is the time you should involve your stakeholders and collaborator in your business decision making who can take the decision according to the business direction and can take immediate necessary actions if and when the need arises.
- *Data Storage*: Consulting firm Gartner Inc. reports that enterprise data growth rates now average 40 percent to 60 percent per year. Simply storing the data is becoming a real challenge.^{xv} Companies are looking at options like data lakes, which will allow them to collect and store massive quantities of unstructured data in its native format. The problem is, data lakes have to be constructed wisely or they quickly become a useless wasteland where data goes to never be retrieved again.
- *Data security*: Most of the companies know the significance of security, but many ignore it due to the complexity it creates. Initially, the big data analytics will not be providing any kind of security, as it only keeps a small amount of the customer information for future analysis. However, in the later stage when bulk data is gathered the big data analytics secures it from all the internal as well as external risks. A secured platform is what's expected in the real-time analytics, which will improve customer loyalty and strengthen the bonding.
- *Manpower for Managing Data*: Not everyone can stroll in and make data meaningful. It takes a full set of hard and soft skills in order to be a successful data scientist. While the debate over the shortage of IT workers rages on, in the realm of data science, the shortage is a proven reality. One option for businesses at this stage is to develop their own data professionals in house. But this can be very expensive and the results will often fall short. The other option is to work with an organization that specializes in big data. That way, you are allowing the people in your own company to specialize in whatever it is your company does, while letting the data people handle the data stuff.^{xvi}
- *Big data governance strategy*: The resources from where you collect data should be true-blue, so that it can be trusted by users. Big data analytics used as retail analytics should be stored with the highest security. If any organization is using the data, then limitations should be defined in terms of how much data to use and for what purpose. These data are just like valuable assets as they are customer's record that supports in understanding their behavior, taste, preferences, and budget. Hence, in the retail environment, big data helps in generating value.^{xvii}
- *Data utilization*: Businesses are always in love with numbers. They decide to come to the final decision based upon the numbers. But these numbers if not correctly made use of can ruin any business. When a company is planning to launch a new product, it is the retail analytics outcome that they depend upon to identify their target customers. The entrepreneur should have the ability to understand which data is necessary and how to utilize that data with the previous data sources. For example, you are selling glasses, so your target customers must be those who love eyewear such as specs or lens. Thus, your focus must be on these prospects, and not on somebody who is looking for a bag for his girlfriend. This first thing here is to

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know who your target customers are, or else, the result can be terrible. Harnessing Big Data for great in-store personalization is also an important feature of retail analytics.

- *Solution Cost*: Since Big Data has opened up a world of possible business improvements, there is a great deal of experimentation and discovery taking place to determine the patterns that matter and the insights that turn to value.^{xviii} To ensure a positive ROI (Return on Investment) on a Big Data project, therefore, it is crucial to reduce the cost of the solutions used to find that value.
- *Measurement of Social ROI*: Social ROI should only be measured in some form of financial metric. “Views” and “comments” can be a nice barometer – but you would be hard pressed to make a legitimate business case for something without a meaningful financial metric. Whether it is increased deal flow, reduced cost of customer acquisition or something of that type, it is only a matter of time before social ROI is placed under the analytics microscope. The tools to do this are already around; it seems to be a question not of “how to do this” but rather “when will marketers adopt it”. In the coming years, the adoption of big data analytics in retail will be sky-scraping for consumer-oriented organizations. This is because the advanced analytics can generate a higher ROI for retail companies if done appropriately.^{xix}

V. CONCLUSION

Knowing who is not purchasing and why, can be as important as understanding those who do purchase. The right insights enable a closer, stronger relationship with consumers. The possibilities are almost endless when it comes to analytics projects - retailers may choose to begin in any number of business areas, pivoting to the data-driven decision culture required as the Internet of Everything evolves. The key is to launch and define a winning data strategy for key business areas, mapping the right metrics to decision processes. Such programs help retailers achieve differentiation of products, drive conversion, personalize the customer journey, and manage the business more efficiently. Based on a more accurate and comprehensive body of data, they will lay the groundwork for business success both now and into the future. The importance of customer loyalty is well acknowledged, and successful retailers are continuously looking to invest in customer loyalty programs to attract new customers and retain their customer base. It is imperative for retailers to delve deeper into customer data and utilize different analytic tools to derive more valuable customer insights.

Retailers that capitalize on these trends will better connect with their customers and win at the loyalty game. The line between online and offline is blurring more than ever. As retailers work to build experiences that best represent their brand, regardless of channel, they will be wise to leverage the complementary strengths of digital and physical for the ultimate good of the customer – and their own bottom line. As consumers become more demanding and expect greater capabilities in an always-on world, Big Data and analytics will only continue to influence how retailers set their strategies. Analytics, backed by robust data management, has the capability of burrowing into these mountains of data, too huge now for any human effort, and of discovering patterns invisible to the statistically-unaided eye. It offers these retailers the capability to transform their businesses. For that they need to develop a robust understanding of business along with analytics and fit solutions to challenges rather than the other way round. From return on engagement to return on local, the ability to grab new data and insights is almost endless in today's retail world.

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