Big Data Analytic: New mode of retail intelligence for revenue growth

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Abstract - *Big data refers to the data sets that are too big to be handled using the existing database management tools and are emerging in many important applications, such as Internet search, retail industry, business informatics, social media, genomics, meteorology and social networks. Gone are the days when memory was used to be measured in terms of GigaBytes, TeraBytes or PetaBytes. Today even larger units are being used to measure memory like ExaBytes, ZettaBytes and YottaBytes. In this research paper the central theme is to discuss about the use of big data in retail industry. Large volume of data is created by retailers across their supply chain. The analysis of this huge volume of big data presents sizeable opportunity for retailers. In this paper we will emphasize on the fact that how retailers are and can bring out maximum from big data and can enjoy big growth in revenue. Presented with a huge opportunity to better understand and serve customers, retailers need to tap into the large volume and high velocity of unstructured data being generated to enable effective target messaging, product creation and supply chain planning. Retailers need to equip themselves with technologies that will help them break through the gridlock and garner dramatic growth. Big data would help retailer leverage large and high speed data sets through intelligent analytics to uncover customer trends and track customer behavior in a cost effective manner. In this research paper we laid stress on the fact that retailers need to embrace the power of big data and implement solutions using a comprehensive strategy. Big data solutions provide tremendous opportunities to help retailers win.*

Key words - **Big Data, data volume, data velocity, real-time analytics**

1.INTRODUCTION

Big data corresponds many things to many people according to need and is now no longer confined to the realm of technology. While big data is more data from more sources than we have ever seen. Big Data results in a cultural shift, the way retailers connect with consumers in a meaningful manner. The size and information in big data is what makes it a business useful and attract retailers around the world to leveraging it to transform their processes, their organizations and, soon the entire industry. Much more data can be derived as the customers and the business firms are connected through a network that defines the Internet of Everything (IoE) world. IoE create new potential for business innovation by combining people, processes, data, and things to enable the transfer of information. Devices and sensors offer up data from processes and their components, expanding the role of data in decision making across the entire retail enterprise.

Analytics moving from merchant-driven business models, where the product is the differentiator to digital models, where every decision is informed by data. Consumers are buying goods by comparing them by reviews given by other customers who had buy it in past. Brand engagements are becoming more closed to individual shopper preferences, creating a brand relationship by attracting the consumers to buy what they want through digital companionship based on big data insights and understanding the customer. To develop customer-brand relationship, retailers are now less dependent on shorter product cycles and more on customer experience created through strategic use of data and analytics. Companies understand that to compete in their respected fields they need the ability to capture the information from vast heterogeneous data created by the consumer at various points i.e. POS, social media etc. Companies around the world are seeking new ways to look at big data and beyond.

2.BIG DATA REQUIRES STRONG ANALYTICS CAPABILITIES

Big data itself is of no use until it is processed for useful information and to solve important business challenges. For more proper insights one requires access huge different kinds of data sets and system with strong analytics capabilities that include hardware, software tools and the requisite skills to use them. Examining those retailers engaged in big data adoption activities reveals that they start with a strong analytics capabilities designed to address structured data, such as basic queries, data visualization, predictive modeling and data mining (Fig. 1). Retailers were on par with other industries in their use of simulation, natural language text analytics, geospatial analytics, streaming analytics, and video and voice analytics.
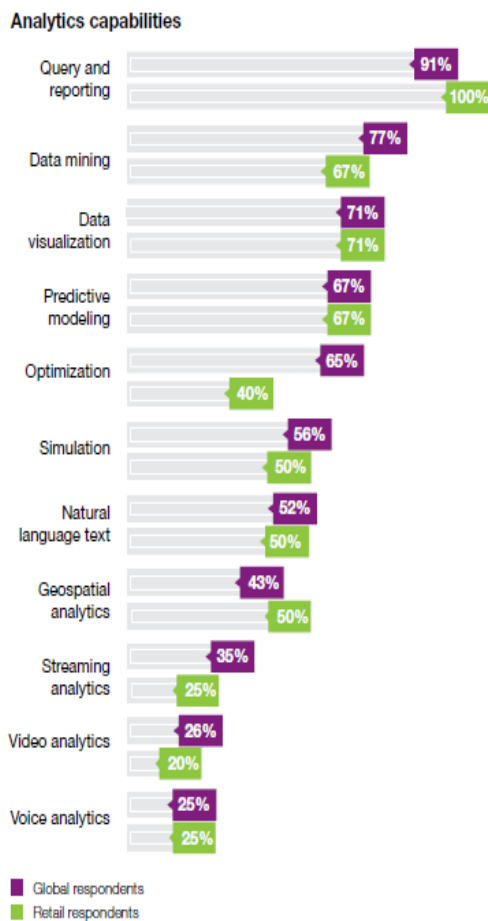
Fig. 1 Figure showing strong analytics with retail companies

Today supermarket chain uses data analysis and optimization to gain deeper customer insights and generate sales. With more than ten terabytes of product and data spread across multiple systems and also INR 1325.90 million in inventory, the companies were unable to easily assess operations at individual stores using manual processes. They needed good and real time operations that would support and improve decisions about business operations. With Big data solution the organizations have seen great improvements across its operations. Now by use of big data managers can quickly review daily inventory levels, store sales to see which products are selling with most profit and which promotions are beneficial for store sales. Big data solution enables chain limit losses by proper scheduling of price to move perishable items prior to spoilage which effectively lowering losses on goods that are approximately 35 percent of the chain's products. By using this stores can adjust quickly as the government's price settings on products fluctuate which intend help organizations to compile sales tax data 98 percent faster than before. Improvements made by this resulted in a 30 percent increase in revenue and a INR 464.06 million boost in profitability for the companies. Hence, visibility of operations and consumer behavior provide insight to choose optimal locations for four new stores.

3.NEED TO UNDERSTAND CONVERSION RATE

Conversion is the standard for comparative performance measurement in retails. It is a foundational metric for retail measurement. It is a building blocks and a requirement for creating high-performance retailing in the IoE (Internet of Everything) era. It normalizes sales performance against the variable opportunity associated with each store, aisle, and category. Conversion has many different definitions, but the true basic calculation is very simple. Conversion is the measure of transactions generated by a population of shoppers (Fig. 2). For example, suppose 2,000 shoppers generate 1800 transactions then result is 90% conversion rate.
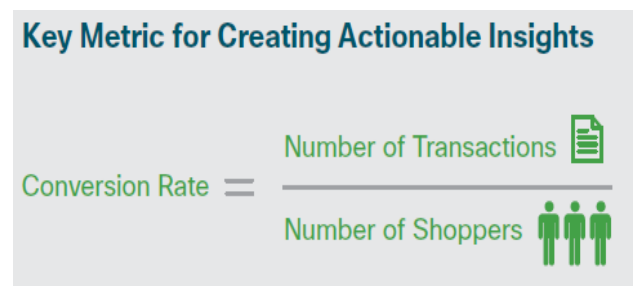

Fig. 2 Formula for conversion rate

Some retailers use number of transaction as conversion. They assume that all shoppers made at least one transaction in fast moving consumer product segments. This method is basically wrong and can lead the business to overlook key problem areas. In grocery and other areas where conversion is basically very high, some of the most valuable conversion comparisons actually come from categories, aisle, and display analysis.

Let's compare two store using sales revenue and transaction count. If Store A reports POS revenue of INR 10,000 and 60 transactions, and Store B reports INR 20,000 and 100 transactions it seems that Store B is the better in performance. However, once shopper traffic is taken into consideration it is observed that Store A had 100 shoppers that week and Store B had 200. So we must consider the results in the context of one very important variable which is opportunity. Now question is What opportunity did each store get to generate sales? Let's see at the shopper population. Using this definition of the opportunity variable, we get that Store A converted 60% of its opportunity and Store B only converted 50% of opportunity. The ATV and sales numbers are better in Store B but they can create a false sense that the business is healthy where in fact many shoppers may be leave the store without purchasing. If Store B could be converted at the rate of Store A (60%) and also keep its average transaction value (INR 200/transaction) the same, it would contribute INR 4,000 more each week without any improvement in traffic. It would give an additional INR 208,000 per year from a single store.

4.PROMOTING BIG DATA ADOPTION

4.1 Commit initial efforts to customer-centric outcomes

Due to its large scope organizations focus big data initiatives on various fields that can provide large value to the business. For most retailers, this will mean beginning with customer analytics that enable them to offer better, more finely tailored products based on a better understanding of customer needs and predicted behavior patterns. Retail organizations can use customer insights to generate enhanced products, adjust pricing, improve product performance, drive customer loyalty and improve customer satisfaction.

To create a proper meaningful relationship with their customers across all retail channels (e.g., store, online, e-mail, mobile, etc.), retailers must connect with them in ways their customers perceive as valuable. The value may come through preferred features and pricing and more timely, informed or relevant interactions it may also come as organizations improve their underlying operations in ways that enhance the overall consumer experience. Retailers should identify the processes that most directly affect customers, pick one and start; even small improvements matter as they demonstrate the value of big data and the incentive to do more. Solutions fuel the insights from big data that are becoming essential in creating the level of depth in relationships that customers expect.

Fig. 3 Showing Promotion of Big Data adoption

4.2 Define big data strategy with a business-centric blueprint

A blueprint shows the strategy, scope and requirements for big data within an organization and is critical to establishing analytic roadmap of IT. A blueprint defines what organizations want to achieve with big data by proper use of resources. An effective blueprint defines overall scope of big data within the organization. In this key business challenges are identified with the sequence in which these challenges exist and the business process requirements that define how

big data will be used. It serves as the basis for understanding the needed data, tools and hardware, as well as relevant dependencies. Blueprint will show path to organization to develop and implement its big data solutions in realistic ways that create sustainable business value. For retailers, one key step in the development of the blueprint is to make business executives in the process while the company is still in the Explore stage. Companies might tap a small group of executives to cross organizational silos to develop a blueprint that reflects a holistic view of the company's challenges and synergies.

4.3 Start with existing data to achieve near-term results

The most cost-effective and logical approach to achieve near-term results is by starting the insights within the organization itself. New insights can be got from existing data store of organization by using tools that are already available.

Organizations should first look internally to use their existing data, skills and to deliver near-term business value. In addition, companies gain important experience as they then consider extending their ability to address more complex sources and types of data. Because of increase in big data most organizations will need to make investments that allow them to handle larger volumes of data from variety of sources. This approach of leveraging internal sight can reduce investments and reduce time to extract the value trapped inside the untapped sources. This can accelerate the speed and help organizations take advantage of the information stored previously, while infrastructure implementations are underway. After that when new technologies become available then big data initiatives can be expanded to include greater volumes and variety of data.

4.4 Build analytics capabilities based on business priorities

The unique priorities of each company should drive the organization's development of big data capabilities, especially given the margins and specific production and distribution challenges that most retail firms face today. The upside of big data is that its efforts can help reduce costs and at same time it increases revenues a duality that can support the business case and reduce unnecessary investments. For example, many retailers strive for improved Omni- or multi-channel models in which the customer experience leverages the strengths of different channels and enables alternate options such as buy online and then pick at store, all while promising and delivering the right inventory in the right place. From a planning perspective, merchandisers and inventory planners must be able to project how the right assortments and inventories must be planned and procured, often with months of lead time and a complex mix of vendors and suppliers. In operations, master data management and inventory visibility become crucial, as retailers must optimize inventory across stock. Retailers should focus on improving specific skills needed within their organization

mainly those that will increase the organization's ability to analyze unstructured data and visualize its analysis to make it more consumable to business executives.

4.5 Create an investment case based on measurable outcomes

To develop the big data strategy and roadmap one requires a solid, quantifiable business case. So therefore it is important to have very active involvement from one or many business executives throughout the process of establishing big data analytics. To achieve long-term success is strong, ongoing business and IT collaboration.

4.6 Getting on track with the big data evolution

Handling Big data is a complex process, IT and business professionals should work together throughout big data journey because of the large Size. Velocity and Variety of the data i.e. Big data. Most effective big data solutions firstly identify the business requirements and then tailor the infrastructure including hardware then data sources, processes and skills to handle the complex data. For competing in a consumer-empowered environment it is transparent that retailers must leverage their information assets to gain proper insight of markets, products, customers, competitors, distribution locations, employees and more. Retailers will realize value by effectively managing and analyzing the rapidly increasing big data and applying the right tools and skills in right place to better understand operations, channels, customers and the marketplace as a whole.

5. CONCLUSION

In this paper, we have introduced a vision of analytics as a new guiding principle for operating in today's tumultuous retail environment. We've discussed the power of becoming a data driven decision-making culture, and shown how access accurate, scalable, and actionable data can help retailers set a roadmap to success through a better understanding of their customers and of their store operations. We've also covered how data can reveal exposures as well as opportunities for the retailer. 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.

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