InData Labs

BIG DATA IN RETAIL

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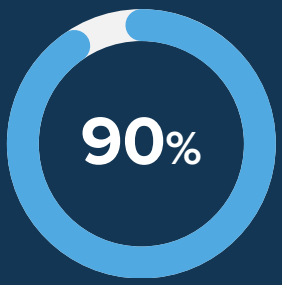
ABOUT BIG DATA

We create 2.5 quintillion bytes of data every day

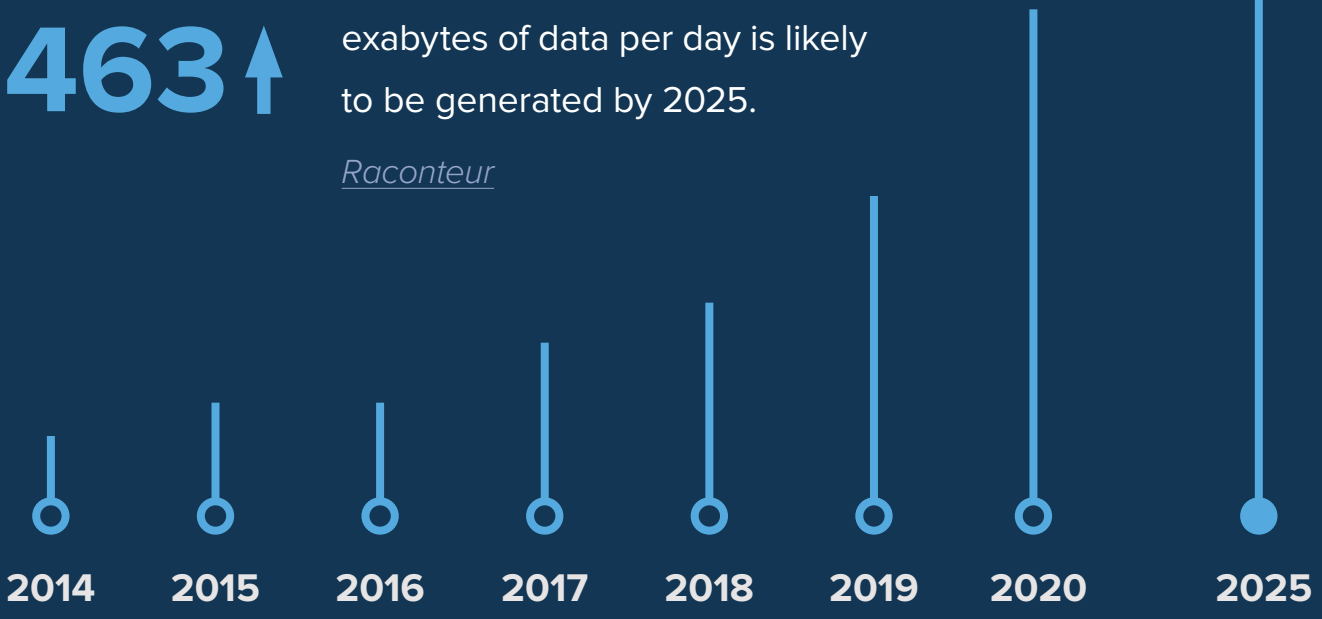


of the big data in the world today has been created in the last two years alone. This data comes from everywhere: sensors used to gather climate information, posts to social media sites, digital pictures and videos, purchase transaction records, and cell phone GPS signals to name a few. This massive, diverse, and unstructured data which is impossible to process via standard software and databases is called Big Data.

Big Data is getting bigger

463 exabytes of data per day is likely to be generated by 2025.

Raconteur



We create around 2.5 quintillion data bytes daily

Domo

This rate will become greater with the growing popularity of IoT (Internet of Things) devices.

Nowadays data management is becoming a critical differentiator that separates market leaders from all others. Most enterprises face Big Data, which is so large that it is impossible to process it using traditional software tools. Forward-thinking companies actively crunch their high-volume unstructured data to get a competitive advantage and find new business opportunities.

Today's high-end technologies make it possible to realize the value of Big Data. For example, retailers, financial institutions and other B2C organizations can analyze the behavioral trends and social media activity of each customer and provide personalized product offerings; they can monitor customer satisfaction with company's products and services and take prompt marketing actions having sentiment analysis in place.

Data-powered predictive maintenance tools empower proactive business strategies that avert costly equipment downtimes and increase production capacities. According to Deloitte, this usage of Big data increases equipment uptime by up to 20% by predicting unexpected failures.

In a current data-laden world, BI reporting is another indispensable tool for modern businesses that helps companies make better decisions and take heed of all incoming insights. This field has spiked in popularity over the last few years and is expected to hit $29.48 billion by 2022.

Oil and gas companies can take the output of sensors in their drilling equipment to make more efficient and safer drilling decisions.

Big Data is a trend across business and IT, which refers to new technologies that can analyze high-volume, diverse data from traditional and digital sources inside and outside the company. Leveraging Big Data analytics leads to more confident decision making, which means greater operational efficiencies, cost, and risk reductions.

Big Data relates to data creation, storage, retrieval, and analysis that is remarkable in terms of volume, velocity, and variety:

Volume

Massive volume of data is contributed by many sources of constantly updated data containing financial, environmental, location, and other information - transactions, social media, use of smartphones, and Internet of things. For example, Facebook produces 4 new petabytes of data every day; a Boeing 737 generates 240 terabytes of flight data during a single flight.

Variety

Data today comes in different formats: geospatial data, 3D data, audio and video, and unstructured text, including log files and social media. Managing, merging, and analyzing different varieties of data is a challenge for many organizations.

Velocity

Data is streaming in at exceptional speed and should be timely processed. Clickstreams and ad impressions capture user behavior at millions of events per second; high-frequency stock trading algorithms reflect market changes within microseconds; machine-to-machine processes exchange data between billions of devices.

What is Big data?

Three key differences between analytics and big data:

Volume
so big, we need new metrics

Variety
an abundance of resources

Velocity
real-time processing

What does this all mean?

What does this mean? Globally, companies are turning to big data strategies to gain an edge over their competition. They realize that good business decisions are now data-driven, not intuitive-like.

> Enterprises analyze data to better understand and reach their customers, develop new revenue streams and improve operational efficiencies.

Big Data adoption differentiates in each vertical industry. Such markets as retail & E-commerce, financial services, telecommunications, and media are making considerable investments to effectively use their data and drive value.

The reason behind these verticals being the forerunners is that they have a lot of customers generating plenty of data, and a continuous need to keep customers happy so that they do not lose them. For example, the widespread use of increasingly granular customer data can enable retailers to improve the effectiveness of their marketing and merchandising. Data analytics applied to support chains and operations will continue to reduce costs, create value and new competitive advantages for growing retailers' revenue.

INTRODUCTION TO RETAIL

As the digital world continues to emerge, information has become the unique environment within which retailers have to compete with each other. Massive volumes of information constantly flow into retail systems through multiple channels. A lot of information is being produced inside retail systems: at points of sales (POS), in supply chains, in customer relationship management systems (CRM) while even more information is generated outside retail systems by customers in social media, call centers, and mobile devices, by governments (statistics, researches), by wearables that boost inflow of unstructured data.

Why Is Big data analytics a must for retail?

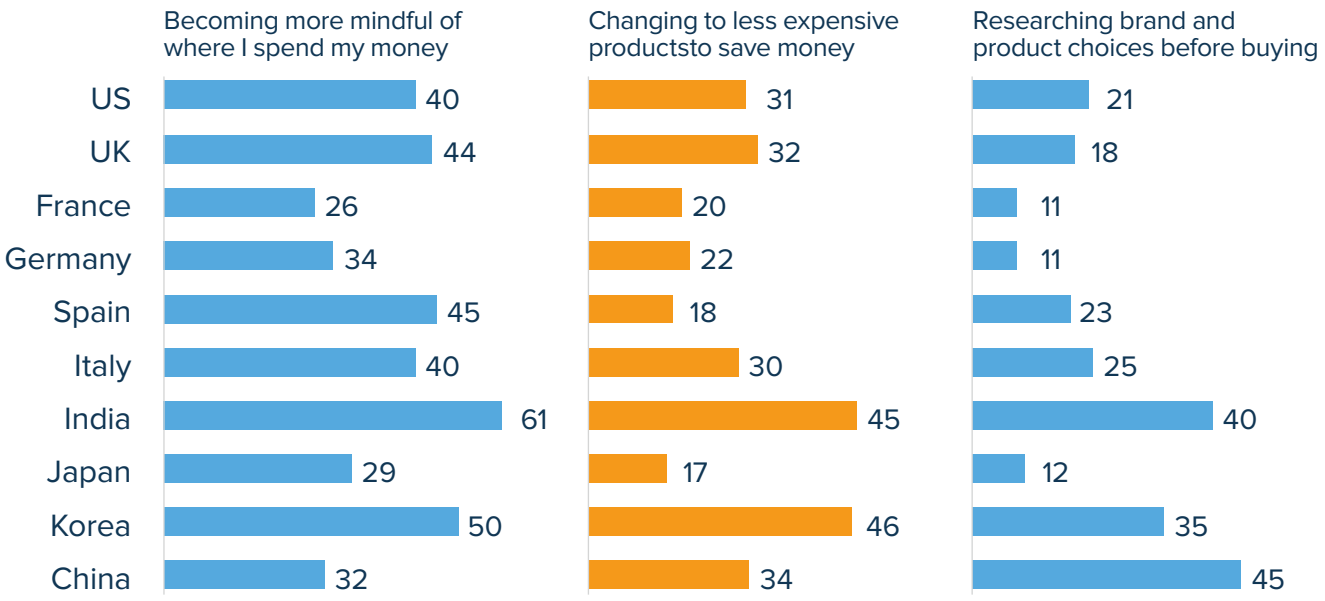
> "Consumer behavior and the business environment are changing fast—and it's critical for companies to keep a pulse on both."
>
> *'Perspectives on retail and consumer goods' by McKinsey*

Also, according to an IBM study, only 10% of all collected data is being intelligently utilized by companies. The majority of retail organizations are not entirely sure about how to get their arms around the growing volumes of customer data.

If we combine that with the ever-evolving consumer behavior during COVID-19, the rationale is clear: retailers must keep up with the twists and turns of the market. As for the pandemic impact, shoppers became more aware of their purchases, thus preferring to explore the brand first. A high-competition landscape also prompts a wide variety of choices and companies to look into. Therefore, during the pandemic, companies should recalibrate time-tested processes and understand what shoppers value as well as re-evaluate their relationship with their customers and implement new pricing strategies.

There has been a shift to mindful shopping, including some trading down for value.

Change in shopping mindsetsince COVID-19; % of respondents who are doing more



McKinsey

It's a mandate:

- The big data market in retail is projected to reach $13.26 billion by the end of 2026.
- Amazon generated 35 percent of sales through its recommendations engine.
- E-commerce web traffic accounts for over 21 billion visits due to the digital shift during the pandemic.

It's a struggle:

- The most recent limitations for big data initiatives are technical limitations.
- The shortage of qualified staff also impedes the implementation of analytics.
- Privacy data issues, quality, and completeness of data are among the most difficult challenges on the way to useful insights.

For that reason, we should admit that this is the time for Data Scientists and Big Data Consultants who can help retail companies to overcome the lack of experience in big data analysis and big data strategy implementation. **With the help of Data Scientists, each retail company will be able to discover insights that:**

- **Unlock new growth opportunities**
- **Enable omnichannel retailing**
- **Enable real-time information processing**
- **Make predictions, and much more.**

Unlock new growth opportunities

> According to a McKinsey report, a retailer using big data to the full has the potential to increase its operating margin by more than 60 percent.

Even with fewer human resources, a company can leverage technology and analytics to outperform the competition. Around 44 percent of companies say that customer insight is a top marketing and sales priority in their organizations, overtaking other trending tech topics. Thereby, analytics will be the key to unlocking growth opportunities, while traditional methods such as cost-cutting, squeezing suppliers on margins won't work in the future.

There are many ways in which sophisticated analytics can help employees arrive at the relevant insights that can improve decision-making. As organizations create and store more transactional data in digital form, they can have more accurate and detailed performance information on everything. Big data allows micro-segmentation of customers and therefore much more precisely tailored products, better return on marketing investment, better pricing, and assortment decisions.

With insights from Big Data retailers can improve their key operations - optimize merchandising, supply chain, store operations, human resources management, and establish effective communication with customers. As a result, the use of analytics impacts transactions and customer experiences in a way that leads to sales growth, costs reduction and helps turn inventory faster and improve the bottom line.

Big Data retail levers can be grouped by function:

Marketing

- cross-selling
- location-based marketing
- in-store behavior analysis
- customer micro-segmentation
- sentiment analysis
- enhanced multichannel consumer experience

Merchandising

- assortment optimization
- pricing optimization
- placement and design optimization

Operations

- performance transparency
- labor inputs optimization

Supply chain

- inventory management
- distribution and logistics optimization
- informing supplier negotiation

New business models

- price comparison services
- digital markets

Enable real-time information processing

Customers are getting more sophisticated these days - they know what they want and they expect retailers to know it too. Retailers need to process customer information in real-time to respond faster and smarter to dynamic customer demands and provide a better customer experience.

Companies need to invest in automated “algorithmic marketing”. The approach allows the processing of vast amounts of data through a “self-learning” process to create better and more relevant interactions with consumers. In real-time retailing sales can be increased through up-sell recommendations (offering the higher quality or higher quantity items that a customer might be interested in) or cross-sell recommendations (suggesting other products that are frequently purchased together).

The real-time behavioral analysis identifies what is important for a particular customer in shopping decision-making, e.g. one type of customer may be addicted to a certain brand and others may be driven by discounts. Real-time information processing enables retailers to make the best offer to every customer and increase customer loyalty.

Enable omnichannel retailing

Emerging trends and technologies that will make waves in the retail world in upcoming years all revolve around the major idea that retailers embracing multiple channels to serve customers will be the most successful ones. Omni-channel retail has become the norm. Consumers now have multiple touchpoints with brands (online, offline, and mobile). Consumers use different channels to ensure the best purchase. They don’t care to draw the dividing line. Therefore, retailers should learn to combine and analyze public data from the web along with social data and proprietary data such as customer contact information and purchasing data.

According to Forrester's research «Consumers have heightened shopping expectations in the era of omnichannel; 71% expect to view in-store inventory online, while 50% expect to buy online and pick up in-store». It's clear that today's consumers are focused on convenience, and they expect their retailer of choice to provide this convenience across all channels.

> Besides, those with the best omnichannel customer experience management (CEM) programs achieve a 91% higher year-over-year increase in customer retention rate on average.

Big data and analytics have the potential to become a real driver for omnichannel retail as big data analytics enables retailers with powerful tools:

- insights applied in commerce, marketing, and merchandising;
- influence in social networks and media to create personal engagement with the brand;
- "one-to-one" personalization, where the customer has a completely tailored experience that seamlessly travels with him across all touchpoints

Make predictions

In today's highly competitive retail environment, it's crucial to know how consumers will react to new products even before they're launched. Therefore, leading companies apply Data Science to produce future-oriented answers to the company's strategic and operative questions. Big data analysis allows retailers to predict trends, prepare for demand, pinpoint customers, optimize pricing and promotions, and find the best-next-product for every customer.

The following key use cases will help you better understand how Big data analytics can bring value to your business. You will find out more about sources of consumer data and technologies used for Big data analysis. Get prepared for the challenges you might come across implementing your big data strategy!

RETAIL. CASE STUDIES

1 Case study
Customer insights mining

Customer sentiment is a key to personalized services

BUSINESS PROBLEM

A US medium-sized FMCG company was looking to enhance their customer lifetime value by leveraging customer service analytics. For that, they needed a text mining solution to compile, analyze, as well as mine text and voice recordings data across channels. The desired result was an established pipeline for data analysis and text mining to get business insights.

SOLUTION PROVIDED

InData Labs suggested the implementation of analytics NLP solution for email and audio data analysis based on multiple diverse data sources. All data should come to a single point of analysis for a comprehensive analytical pipeline that mines customer sentiment and then visualizes it for further discussion.

BENEFITS

- More granular customer services based on customers' sentiment
- Increased customer satisfaction

2 Case study
Cross-selling

We know what your customers will buy next

BUSINESS PROBLEM

The owner of an online marketplace was looking to improve customer experience and increase business revenues. Moreover, the business suffered from a low returning ratio which emphasized the need of amplifying existing shopping experience with a more data-driven strategy.

A comprehensive data flow was required to get actionable customer insights and analyze customer behavior. However, the on-site capacity of our client lacked expertise and resources to establish the analytical lifecycle. Incomplete and scattered customer data made it impossible for the company to offer “one-to-one” personalization to its customers. As a result, the offers and recommendations missed customer needs, thus leading to poor customer experience and low satisfaction levels.

SOLUTION PROVIDED

InData Labs advised the retailer to implement the ‘next best product’ model and increase sales through cross-selling function. Solution provided successfully integrated historic sales data with customers’ demographics, purchase history, and location data.

By merging personal customer data with these insights a strong analytical tool was created to determine the probability that a particular customer would purchase a complimentary product. The solution enabled the client to make “one-to-one” personalized offers to each visitor of the online store.

To make predictions of ‘next best product’ we primarily determined which products in the marketplace is naturally used together and which products are bought together according to statistics. Then we discovered insights of different kinds, e.g. how preferences of buyers vary in different geographic areas, how behavioral patterns depend on the season, and even on the weather conditions.

BENEFITS

- 30% increase in sales
- customer satisfaction level has risen due to personalized approach to each customer
- improved customer loyalty: the number of returning customers on the client’s site

3 Case study
Effective marketing campaigns

Success is where offline and online merge

BUSINESS PROBLEM

A mid-sized retailer with offline and online presence needed a solution to reduce promotion campaigns expenses. The main challenge was a vast amount of unstructured and incomplete data that failed to bring value and enable data-driven decisions.

Real-time analysis was also needed to enable relevant insights and amplify more accurate decision-making so that the company can adjust promotion campaigns to relevant customer needs.

SOLUTION PROVIDED

InData Labs provided the retailer with an integrated solution that uniquely combines all customer data from various sources: in-store, online, mobile. The solution includes a full set of predictive analytics and data mining tools. It allows marketers to plan, test, and execute marketing campaigns of any size and any level of complexity.

We've built a lifetime value scoring algorithm to segment customers on behavior and occasions Thanks to real-time customer behavior analysis marketers can now make mid-promotion corrections in time, drive targeted campaigns and optimize costs.

BENEFITS

- faster decision-making and labor cost reduction
- 22% annual marketing cost reduction

WHERE ONLINE AND OFFLINE MERGE!

4 Case study
Assortment planning

Cost reduction requires agility and that's our specialty

BUSINESS PROBLEM

A fast-growing direct selling company was looking for a solution to provide better control over its logistics costs. The major goals were to improve sales estimations and minimize stock losses. Therefore, the client was looking for an automated assortment management tool to plan an assortment of 150 items of different colors and sizes in more than a thousand stores.

SOLUTION PROVIDED

InData Labs created an automated data transformation tool for managing the company's assortment. The tool has analyzed and structured the historic sales data of the company and is now providing real-time feedback about sales. The client can review its performance, forecast demand, and plan assortment with more agility all in one system. The self-learning algorithm is improving the accuracy of predictions over time. Decision-makers in the company now have insights into seasonal patterns for every item.

BENEFITS

- faster & more accurate predictions
- improvement in a number of key inventory performance metrics
- overall inventory cost reductions by 15 percent

5 Case study
Customer micro-segmentation

Loyal customers must be detected and encouraged

BUSINESS PROBLEM

A growing European E-commerce marketplace needed a solution to raise their campaign effectiveness across 5 European countries. The retailer saw RFM (Recency Frequency Monetary) customer segmentation as a primary step towards the company's performance improvement and better customer profiling. The client wanted to differentiate a loyal customer from a one-time buyer and keep the segmentation up-to-date.

SOLUTION PROVIDED

InData Labs has developed a marketing analytics framework using RFM scoring. Having key metrics clear, we've created an analytics tool for RFM migration tracking. The tool enables real-time information processing and provides up-to-date customer segmentation. The system can recognize migration patterns and predict the next purchase propensity. All the insights help marketers to establish effective communication with each customer segment and put the customer migration process under control.

BENEFITS

- a better understanding of customer behavior
- ultimate increase in sales
- 10% ROMI (return on marketing investment) improvement

ABOUT INDATA LABS

Our team delivers high-end engineering services & intelligent data analysis to achieve increased profitability of your business through constant innovation, insightful & data-driven management.

Leveraging the latest big data technologies with a highly professional & talented team ofdata engineers, statisticians & mathematicians, we help our clients solve high impact business problems in Marketing, Merchandising, Supply Chain, Fraud Detection, Risk Analytics to name just a few areas. Our core industry competencies are FMCG & Retail, Supply Chain & Logistics, Sport & Wellness, Digital Health.

Big Data Strategy Consulting

- Use cases definition & prioritization
- Architecture design
- Road Map elaboration and Strategy report delivery

Architecture Analysis and Improvement

- Analyzing the app and its needs along with business requirements
- Building a plan for on-prem to cloud migration
- Designing solutions for a cloud-native app
- Creating an infrastructure upgrade roadmap
- Getting an action plan on future improvements
- Automating all manual processes with CI/CD pipelines to reduce the cost of operation and minimize human errors
- Implementing serverless solutions to reduce the cost of infrastructure and improve the overall performance of the application.

Big Data Pipelines

- Designing Big data analytics software solutions based on business requirements
- Developing, testing, evaluating and maintaining Big data analytics tools Preparing data for analysis including cleaning, data quality checks, and merging data to the single point of analysis
- Building event-based infrastructure for data processing
- End-to-end solutions including delivery to required Data Warehouses (including on-prem).

Data Analysis and Visualization

- Processing the data to the point of analysis with all data points required
- Preparing reports for stakeholders, including insights and predictions
- Creating custom algorithms for specific client's needs
- Visualizing all reports and insights
- Creating visual dashboards, including deployments to the client's side.

More information about InData Labs services is available on the Web at **www.indatalabs.com**