SOULPAGE
IT SOLUTIONS

eBook

Merchandising Data Science & AI For Retail

Sale

Introduction

The retail industry is constantly evolving. And is facing new challenges- new digital touchpoints, a premium on experience, more demanding, and better-informed customers. Retailers must gear up to harnessing the potential of data and leverage Data Science technologies to answer the various challenges. Although retailers have been making experienced based decisions, there is a need to take the next big leap with data-driven decisions using tools of Data Science.

The amount of data stored and analyzed is humongous as data is getting generated from multiple touchpoints - website, social media, apps, and more.

> *According to Gartner, the volume of data is set to grow 800 % over the next five years and 80% of it will be categorized as unstructured data.*

Analyzing data captured across the value chain can help retailers know its customers better, reach them with targeted messages, boost the shopping experience, and draw a path to long term profitability.

In an attempt to help retailers leverage new age technologies and optimally gain from their investments in Data Science, this eBook discusses the following points:

1. **The next-gen Data Science technology trends**
   (I) Emerging/assisted technology trends in retail industry
2. **Benefits of Data Science in Retail**
3. **Real-life Applications and Use Cases for Retail Industry**
4. **Steps to success**

1 The next-gen Data Science technology trends

Accelerating Business Value with Data Science Technology Trends

The retail industry has always been a data-intensive industry. Data generated from various sources will provide insights into customer behavior. Many retailers are investing in technologies like data science, AI, machine learning, mobile apps, etc., to gain an edge in the competitive market by successfully spotting opportunities, swiftly assess ideas and test-run them, and learn from these experiences. With innovative marketing strategies combined with the latest technology, retailers are able to add value to their businesses by providing higher levels of customer satisfaction.

Artificial Intelligence

According to an August 2018 survey of 400 retail executives worldwide by Capgemini, AI could save retailers as much as billion annually by 2022.[1]

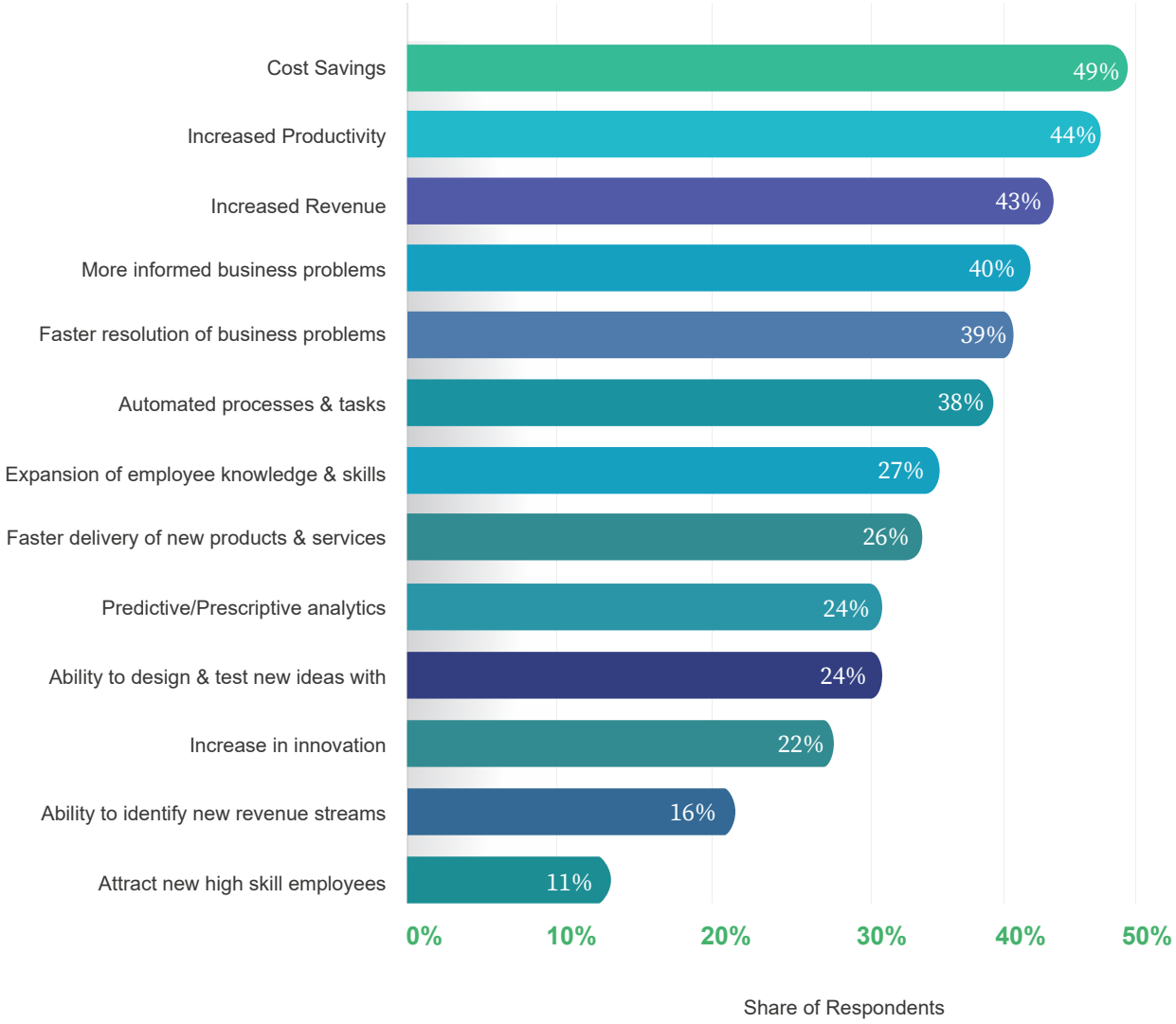
AI boosts promotion efficiency by enabling automated ad buying, personalizing customers' online experiences, and serving users targeted recommendations. It also facilitates actionable insights in forecasting demand, store operations, optimized pricing models, marketing and advertising strategies, and promotions.

AI helps retailers in drafting out marketing strategies based on demographics, competitors, weather patterns, etc. Apart from optimizing the supply chain processes, AI also facilitates proper personnel and inventory management strategies. It can also radically change the customer experience with personal shopping assistants.

Benefits of AI for Retail

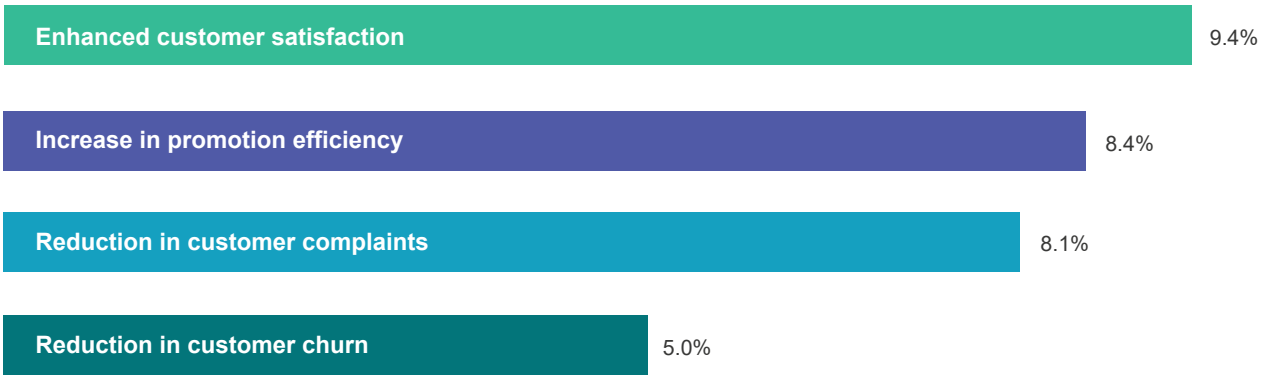
Artificial Intelligence and its renowned applications are changing the way retail operate in the 21st century. Many of the businesses integrating this intelligent technology are experiencing significant results, while some are still opting for a second opinion. We tried to present a survey that helps you in understanding the importance of AI and its prominence in retail to revitalize traditional practices to improve customer experience and increase business outcomes.

The below bar graph illustrates the survey results conducted by Statistica to know AI prominence in the retail vertical. The survey results shown in the bar graph indicates total percentage of respondents agreed that embedding AI in retail can enhance the following question as listed, respectively.[2]



How are retailers worldwide expecting to benefit from using ai in customer-facing functions?

% of repondents, Aug 2018



French food and grocery company Auchan, in partnership with UntieNots, has imbibed AI into its promotional operations to improve the offers provided to its customers. The company's loyalty cardholders are encouraged to take few challenges, which usually involves purchasing and spending a certain amount on a certain product or brand, to get insights about the customer's tastes, preferences, purchasing decisions, etc., using AI.

The amount a customer has to spend on the challenge is decided upon his/her purchase history. Once a customer successfully finishes a challenge, he/she is rewarded with an offer targeted at that product or brand. Upon successful completion of the challenge, with AI implemented, everything spent on the customer's loyalty card will provide all the necessary inputs to the company to improvise their targeted promotions.

Machine Learning

Machine Learning allows retailers to identify patterns from historical and real-time data that humans and traditional forecasting tools have missed. This technology has become more extensive as hardware improvements make it possible to handle the large volumes of data and run complex algorithms. It allows the retailers to maximize results, improves their abilities to measure store efficiencies, optimize targeting, early detection of fraudulent activities, and mitigation.

Data-driven platforms, such as the one used by Anheuser-Busch, track metrics to allow retailers and algorithms to constantly learn from prior data, and improve performance by leveraging machine learning.

According to Juniper Research, the estimated total spend on Machine Learning by the Retail industry in 2023 will be $12 Billion with a surge of 230%.[3]

Predictive Models

Predictive Analytics is a branch of advanced analytics techniques that allows retailers to predict the future. It helps in identifying and reducing the risks by analyzing the historical data of the business. The models of Predictive analysis enhance the marketing campaigns by predicting customer behavior, retain existing customers by using cross-selling techniques, and gain new customers. Big Data predictive analytics helps in managing

business resources. For example, airline companies use predictive analytics to set airfares. Walmart handles approximately 1 million customer transactions per hour globally and this data is entered into databases that are estimated to have 2.5 PetaBytes of Data. Handling such huge data makes it inevitable for Walmart to adopt Data Science and its predictive models into its business processes.[4]

(I) Emerging/Assisted Technology Trends in Retail Industry

Assisted technologies are the technologies and tools that are being leveraged to implement the above said Data Science technologies. Assisted technologies help in the smooth execution of the data inputs and derive the best results for the retailers.

IOT

IoT technology is changing the shopping experience. From smart mirrors, personalized discounts, smart shelves, digital signage, bluetooth devices enabling multiple goals in areas such as payments, floor space management, and interactive signage to RFID, and more. IoT is making it possible to collect, analyze, and store data through various connected devices and provide personalized services based upon the data sets. An automated checkout system is proving to be more effective with customers as it saves a lot of their time.

McKinsey estimates automated checkout can reduce the cash counter personnel requirements by up to 75%.[5]

Beacons are widely used by retailers to send product and marketing alerts on the customers' smartphones based upon the location proximity. Customers can get information regarding offers, discounts, or other reminders when they are nearby the store and have previously downloaded the store app.

Retail

IoT is charging retail forever. It's personalizing the in-store experience with offers built on purchase and browsing history. Its making wayfinding easier. And it's providing unprecedented insight into buyer behaviour, so retailers can delight customers across every channel.[6]

89% of early movers in this sector are gaining increased insight into customer preferences & behaviors from IoT.

77% of customers seeing IoT change the customers experience.

77% of early-movers in retail say IoT creating opportunities to collaborate with new partners in delivering products/services to customers.

84% of retail early-movers in say their customers value enhancing information to improve their experience.

Mobiles

Smartphones are generating more data and throwing new challenges for analysis and storage. Obtaining insights from this ever-growing database poses a challenge to Data Science and its platforms. By leveraging Data Science algorithms, the data collected from mobiles can be utilized to derive various marketing and remarketing strategies for any business. The latest technology combined with the hardware input, like Sensors and Beacons, makes it possible for any retailer to analyze customer behavior and preferences and draft personalized product recommendations based upon their purchasing patterns. With the help of Location Intelligence, the customers are notified with the current offers, new products, or any related reminders, whenever the customers are in the nearby location and have installed the store app previously on their smartphones.

The world's largest hamburger chain, Wendy's, is a fitting example of a retail company that cleverly leveraged technology to determine location analytics and location intelligence by implementing the GIS services of a technology company. Wendy's wanted to determine how far customers are willing to travel to come to Wendy's. Location analytics has allowed the staff to easily view sales records and customize demographics on existing restaurants. More than that, Wendy's was able to predict the value and risks for new and existing restaurant locations.

2 Exploiting Data Science In Retail

Data Science and its platforms provide the following benefits in a retail context :

- Based on the previous purchase history, data science offers personalized product recommendations for advertising, automated upselling, promotions (both instore and online), and also enables the retailers to forecast the demand and make supply decisions in advance.

- Retailers are provided with various price optimization models. These models are developed depending upon the key pricing variables including demand, supply, seasonality, and offer insights to adjust the prices accordingly.

- Optimizing inventories is an operation that affects many aspects of the supply chain. To gain a competitive edge and drive better business performances, retailers are looking to improve product availability while increasing store profitability.

- The complex nature of product life cycles is forcing retailers to use Data Science to gain an edge on supply chains and provide optimal product distribution.

- Optimized routes can be suggested for more efficient deliveries according to past data and behavior. Optimizing a route involves calculated decisions on various aspects like traffic, weather conditions, stoppages, etc.

- Customer segmentation can be done based upon their previous purchase history, geographical location, tastes and preferences, financial feasibility, etc.

- Data Science provides models regarding merchandising and store layout which are essential elements among others to track the store performance.

- They generate models to forecast and analyze customer behavior so that retailers can deploy the sales and customer service personnel accordingly to generate sales and increase ROI.

3 Using Data Science & AI In Retail

Data Science is becoming an influential segment in all the business processes in retail, including product development. Advances in data management, cloud computing, and the embracement of Big Data by the retail businesses is ushering in a new age of product development processes and methodologies.[7]

Application of AI and Big Data into their data-driven strategy has given Coca Cola a cutting edge when in 2017, it decided to introduce its new product Sprite Cherry into the market. The product was the end result of the data collected by the company's self-service drink counters where customers were allowed to mix and come up with their own flavors of drinks. The company then collected the data by identifying the most popular drink combinations and developed Sprite Cherry. The company also infused Data Science and its platforms to obtain data from Social Media. With cumulative followers of more than 140 million on Twitter and Facebook combined, Coca Cola gathered all the relevant data to derive at that, on an average, the company's products are mentioned once in every two seconds in the whole world. With the AI-powered image recognition technology, it was able to identify when the company's drinks were being uploaded, the location of the users uploading, and what prompted them to upload the image. Such kind of data can be used to develop customer-specific and location-specific adverts which are more likely to get clicks.

Omnichannel Interactions with Customers to Collect Data

A smart practice adopted by smart retailers is to harness data from various channels to obtain more sophisticated information about the customers' preferences. Omnichannel is all about leveraging the digital channels along with various physical channels to obtain the data on customers' purchasing journey. With this huge wealth of customer data, retailers will be able to derive new and innovative marketing strategies for revenue generation and effective cost management measures.

Dominos Anyware is a multichannel approach to reach its customers through online and offline means. Customers were able to order their pizzas through their Order Now button present on their website, social media pages, along with ordering through a phone call or by visiting their store. This initiative of driving orders from various online channels has definitely borne results to Dominos. Domino's AnyWare enables its customers to place their orders through 15 digital ways – allowing them to order from anywhere, at any time, using whatever device they would like. It is now generating more than 65% sales through online channels in the US while the remaining sales are being generated through traditional ordering techniques like telephone calls or in-store orders. Dominos leverages Big Data for pulling the data from various channels and putting it together. The data captured through all its channels are fed into the Dominos Information Management Framework. The data is then combined with the data collected from various third-party sources. Customer segmentation is done based upon the demographic data, competitors' data, geocode information, etc.

Improving Customer Satisfaction through Technology

57% of enterprises believe the most significant growth benefit of AI and Machine Learning will be improving customer experiences. And 75% of enterprises using AI and machine learning believe customer satisfaction can be improved by more than 10%. Customer satisfaction is the key to any business. Attaining it through the latest technology will add more value to the brand.

In 2017, online retail giant Amazon added an augmented reality feature in its IOS app, which allowed its customers to see the digital renderings of few products. Customers can try the products virtually and decide to buy them only if they are satisfied. The app also recommends related products to the customers based upon their purchase history and their preferences. Similarly, in the same year, furniture company IKEA imbibed AR in business processes and developed an app called IKEA Place. This app lets its customers see how more than 2,000 furniture items will look and fit in their homes, offices, or business establishments.

"It could eventually be that you put in contact lenses and you don't need to look at a phone anymore. We're really right at the beginning of the big bang with AR and understanding just how it can make everyday life better for people."

– MICHAEL VALDSGAARD,

LEADER OF DIGITAL TRANSFORMATION, INTER IKEA SYSTEMS B.V.

Fraud Detection

Any business will incur losses because of fraudulent activities. It is a serious issue for retailers to prevent fraud and retain customer trust. Data Science helps the retailers in analyzing transactions and activities such as purchasing, accounts payable, POS, sales projections, warehouse movements, employees shift records, internal audio and video recordings, returns, and other data. With this data, it can help the retailer to identify fraudulent activity and develop appropriate steps for investigation. Data Science platforms provide continuous monitoring of the activities and ensure the early detection of fraud. Deep neural networks enable retailers to not just identify the frauds but also to predict future fraudulent activities. recordings, returns, and other data.

Many retail companies like Best Buy, Home Depot, etc., have hired a third-party firm, called The Retail Equation (TRE), and have used its return optimization tool "Verify-3" to identify and prevent return frauds. The tool mines the sales data and keeps a record of customers' returns and flags the potentially problematic customers. The tool is proven to be effective in significantly reducing the returns rates. Verify-3 optimizes the return processes with its analytical models accounting for factors like the companies' return policies and shoppers' purchase and return behavior. This data helps the companies to make the best decisions to balance customer service and fraud prevention.[8]

Merchandising and Stocking

Merchandizing is a vital ingredient for any retail business. The implementation of merchandising strategies will influence customers' decision making. To attract customers and retain them, attractive packaging and branding strategies that enhance visual appeal are deployed. Data Science Analytics tools are being used to attain this.

Floor Space

- Improve physical merchandising
- Reduce waste space
- Allocate seasonal space and calendars
- Shift space between categories

Assortment

- Add popular local item
- Optimize facings
- Determine which product should have dual locations
- Optimize endcap drive aisle and other displays

Adjacencies

- Adjust category locations and product positions
- Minimize moves to distant aisles
- Optimize SKU position, such as height on the shelf, the order in th aisle

Store Design

- Redesign format or floor space
- Change the location of department or services
- Add experiential elements for store clustering

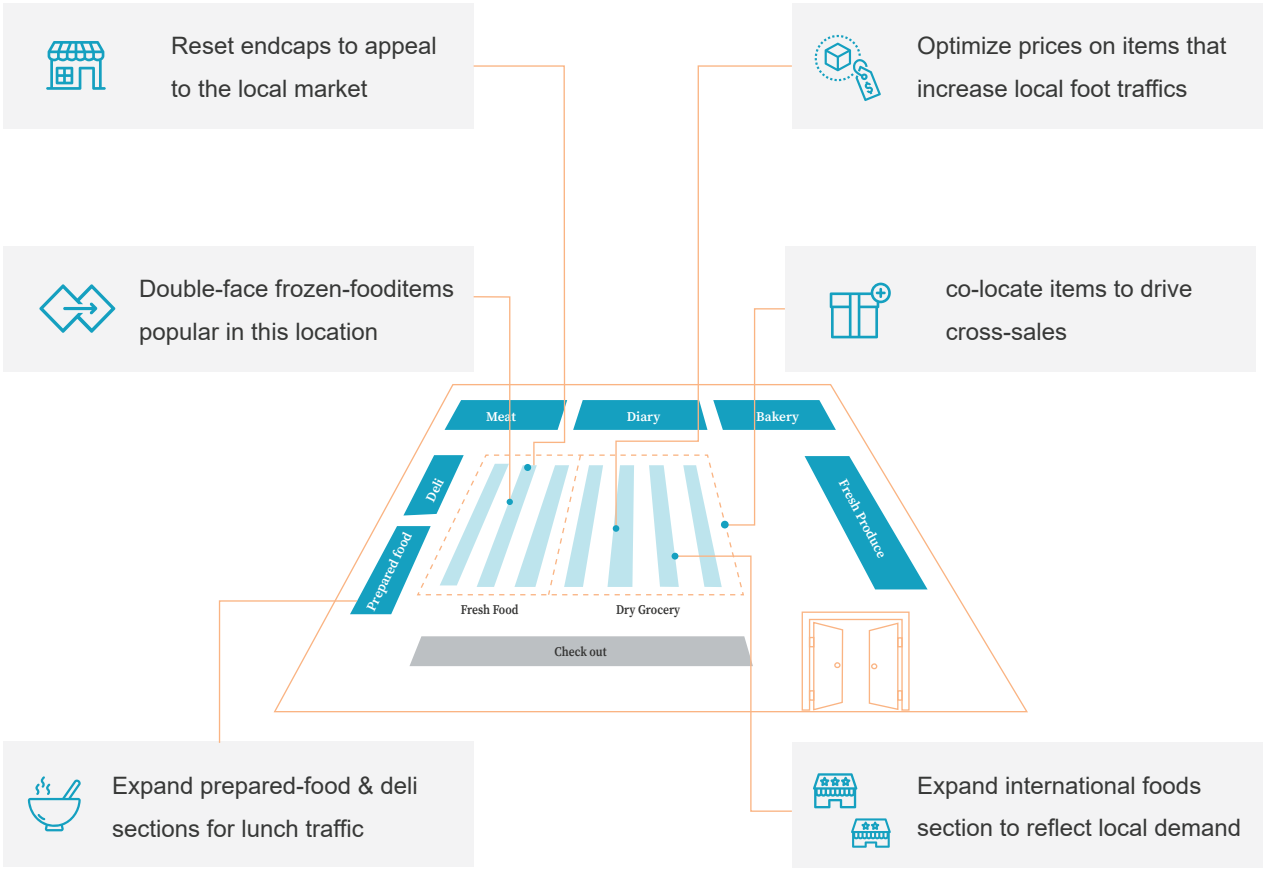
Price

- Create zones for stores with similar competitors
- Designate willingness-to-pay zone
- Define regional known-value items
- Define local dynamic pricing

Promotion

- Select localized promotions
- Localize seasonal and endcap promotions
- Set level, timing, and frequency of discount by cluster

A Grocer's Data-Driven Merchandising Makeover[9]



According to The Wall Street Journal, H & M store is leveraging Big Data and Artificial Intelligence to customize its merchandising mix in stores to better appeal to its customers and algorithms to analyze store receipts, returns, and loyalty card data. The company is also breaking its traditional practice of stocking its stores with similar merchandise. This resulted in clearing out some $4 billion worth of unsold products. H & M cut the number of SKUs by 40%, removing a line of products and replacing it with a variety of different products. By analyzing granular data, the company has observed that its primary customers were women and certain colored skirts were sold better than expected.

4 Steps to success

The successful application of Data Science is an important element of any retail company's success. A more thorough, practical, and sustainable data-driven approach by leveraging Data Science and Artificial Intelligence would add value and drive better outcomes to the retailers. Here we suggest a few best practices that when implemented will help retailers acquire a 360-degree view of their data, customers, strategies, operations, actionable insights, sales, and their business as a whole.

Collect and Understand your Data

Mere collection of data is almost similar to the fact that data on its own has no value unless we understand and analyze it thoroughly to put it to best use. Certain factors have a major play here - like feasibility, approach to data, data quality, the usefulness of data, the methods applied to extract value from data, etc. The better your data is, the better your analysis will be. The data repositories can be either cloud or on-premise but with a central database, you will have access to the entire data on sales, products, customer footfall, average selling price, peak and off-peak times, basket size, etc.

Operationalization

Operationalization means deploying models that help broaden and extend your modeling efforts. It involves monitoring, tracking, execution, and evaluation of multiple strategies in order to select the most optimal solution for the prevailing problem. These Data Science and Artificial Intelligence-powered models garner insights from the data engineered, which in turn will help retailers in customer segmentation, customer relationship management (CRM), product association and merchandising, etc.

Explainability

The most important step to success is the ability to explain and bring clarity among the stakeholders. Documenting each and every step in feature engineering, experiments, evaluation metrics to the end-users, etc., provides a clear understanding and articulation to relevant stakeholders. Explainability results in transparency and helps build trust. With the technological enhancements and development of technology-agnostic tools and techniques.

like Explainable AI (XAI), be it an image and facial recognition, predictive analytics, deep neural networks, sentiment analysis, etc., one has to be aware of how far can they trust these AI systems for decision making. Often, machine learning algorithms are not able to be examined to understand how and why a decision has to be taken. But with XAI, the AI systems leverage the technology to make informed and data-driven decisions while being able to produce transparent explanations and reasons for the decisions that have been made.

Conclusion

The role of Data Science and Artificial Intelligence in Retail is tremendously increasing its footprints in a way that businesses can transform their functions. Retailers are adopting digital technologies like IoT, Augmented Reality (AR), Virtual Reality (VR), Artificial Intelligence (AI), etc., to connect with their customers to obtain fool-proof and data-driven insights about them, their tastes, preferences, etc. Data Science and Artificial Intelligence offer enormous potential for retailers by delivering captivating customer experience, drive cost efficiencies, and improve employee motivation. Customer segmentation, interaction, product recommendations, churn management, pricing, forecasting, supply chain & logistics are a few areas where Data Science and Artificial Intelligence are disrupting the way retailers are operating.

To achieve a successful digital transformation, the retail industry has to go beyond just merely acquiring huge data. This is where **Soulpage IT Solutions** helps you bring value to your data by extracting actionable insights from the data that you possess.

We help physical and online retailers in leveraging deep data science technologies for processes, products, customers, and employees.

Gain deep actionable insights on the industry

Achieve a competitive edge with the retail data

Establish a 360-degree view of the customer

Run hyper-personalized marketing campaigns

Forecast trends and design strategies accordingly

Drive revenue with Upsell /cross-sell

Why Choose SoulPage As Your Technology Partner?

Complete Suite of Services

From strategy consulting to development, our wide range of services will help you at every expand your data capabilities.

Creative Engineering

We understand data science technologies and we know how to creatively leverage it to build customized and innovative products & solutions.

Complete Regulatory Compliance

We ensure proper and complete compliance with the country, state, and industry-specific regulations.

Our Services

Machine Learning

Text Analytics

Computer Vision

Data Analytics

Digital Transformation

Predictive Analytics

Reinforcement Learning

Recommendation Engine

Contact Us

Ramesh Damma

Co-founder, CSO

ramesh@soulpageit.com | +91 9000260110

Soulpage IT Solutions Pvt. Ltd.

Let's Connect on LinkedIn

Pushya Mithra

Co-founder, COO

pushya@soulpageit.com | +91 9177906637

Soulpage IT Solutions Pvt. Ltd.

Let's Connect on LinkedIn

Address

Soulpage It Solutions Pvt. Ltd

B0#13, B Block, Indu Fortune Fields - The Annexe

KPHB 13th Phase, Near Hitech City Station, Hyderabad, Telanagana, India

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