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RETAILERS ASSOCIATION OF INDIA

Retailing in the digital era

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Introduction

With consumers as the principal drivers of change in the industry, decision-making has become more complex than ever before. Every day, retailers are faced with a range of difficult questions concerning the best course of action for their businesses. These can include:

- Who are the most valuable customers and how to retain them?
- How to price offerings in order to maximise profits?
- Which customers should be targeted in the next campaign?
- Which products need to be recommended to customers?
- What should the inventory level be, in order for the business to neither go out-of-stock, nor carry excesses?

Uncertainty has become a defining feature of the retail business model. The key to solving such business challenges, as well as a broad variety of others, lies in the effective utilisation of analytics practices, a discipline that involves extensive use of data, statistics and machine learning to uncover valuable insights from data and help make optimum business decisions.

## *Growth of analytics in retail*

The analytics practice in retail began with simple mining techniques such as writing SQL queries that would typically contain a subset of interest filtered from the parent database, say a list of the top 20% customers by revenue.

However, the advent of cloud-based POS, mobile technology and social media has led to an exponential growth in the volume of data being generated and stored by retail organisations. Moreover, the scope of analytics for retailers has also graduated to using complex statistical and machine-learning algorithms to uncover latent patterns in data as well as predict future outcomes. For example, a typical regression analysis can use demographics and past transaction patterns of customers to indicate their respective propensities to respond to a future campaign.

The fact that such insights are based on hard numbers makes analytics a very powerful tool for enhancing the objectivity in decision-making.

The response to a recently conducted, PwC sponsored survey, typifies the growing acceptance of analytics as an essential component of decision-making across businesses. In this survey conducted by the Economist Intelligence Unit (EIU), senior executives around the globe and across industries* were asked if big data has changed decision-making in their organisations. Almost 90% responded in the affirmative, as is evident from the pie chart below:

Has big data changed decision-making in your organisation?

- Yes
- No, but we plan to do so
- No, nor do we plan to do so (or don't know)
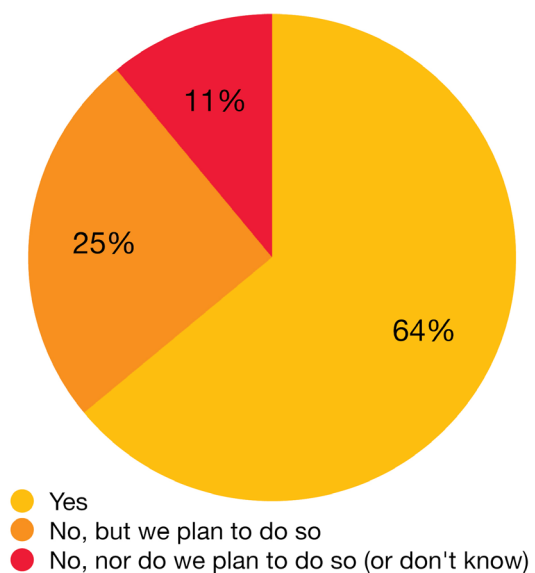
The top changes pointed out by the respondents further establish this shift in paradigm:

- Greater use of specialised analytical tools and techniques
- Employment of a dedicated data insights team to inform strategic decisions

[*In May 2014, the EIU surveyed 1,135 senior executives, over half (54%) of whom were C-level executives or board members. A total of 18 industries are represented in the survey. Around 10% of the respondents were from the following industries: banking and capital markets; technology; retail, energy, utilities and mining.]

Which analytics solution will best suit your business?

Given the broad and growing range of analytical practices, it is not feasible for any retailer to pursue all with equal thoroughness. This makes the selection of practices a rather critical step towards developing a useful set-up.

Such selection must be in sync with the business model and goals of the firm.

To illustrate:

1) For a retailer aiming to be the best price provider in its domain, developing analytical solutions related to pricing and supply chain would probably be the optimum starting point.

2) An organisation looking to expand into new markets should venture into analytics with a focus on solutions related to the selection of store location and store size optimisation.

3) For a high-end apparel brand, which will heavily depend on engagement from a limited number of, but ultra-premium customers; loyalty analytics to develop clienteling solutions will be of utmost value.

The next section of the report explores the breadth of analytical practices in retail, demonstrating their major applications through nine frequently used solutions across three different categories- marketing, supply chain management and customer experience.

Analytics for improving customer experience

With the increase in competition and advent of new channels like web and mobile technology, customers can now choose from multiple options when it comes to making final purchase decisions. So, providing a superior customer experience across channels has become critical for both acquiring new customers and retaining existing ones. Retailers can improve customer experience through prompt response and appropriate messaging based on customers' preferences. Some examples are given below.

Product recommendation

Retailers can use customer purchase history and past transaction baskets to recommend products that they are most likely to buy.

Step 1: Identifying product associations
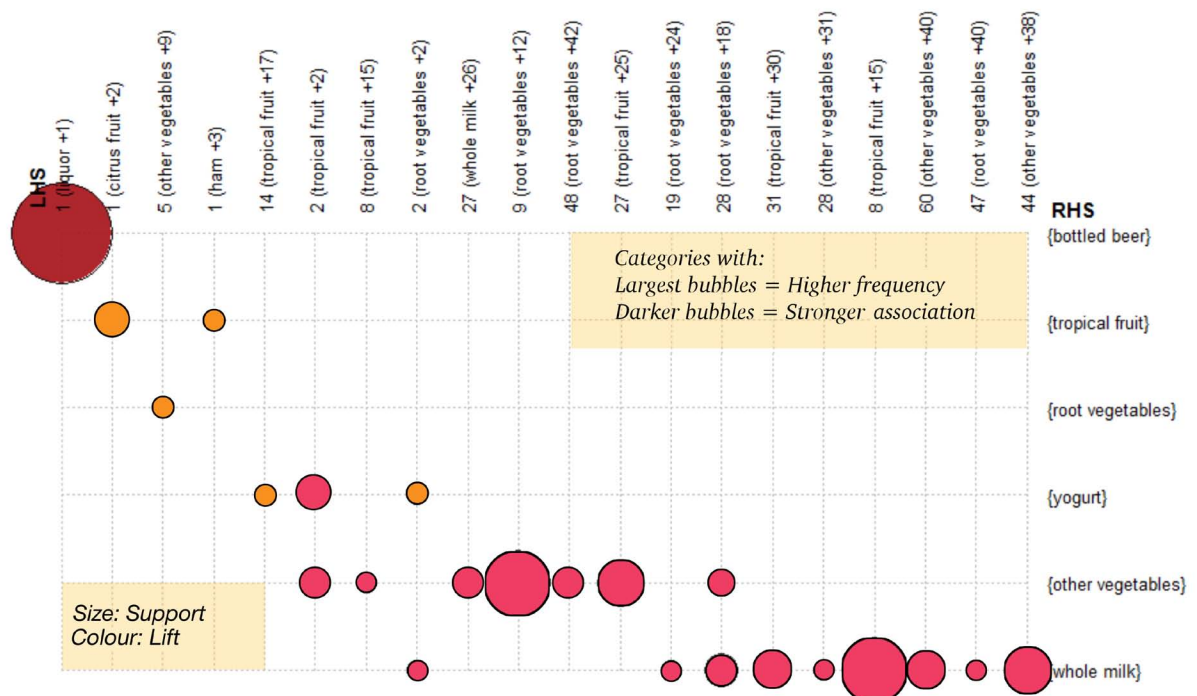
A collaborative filtering model is used for making automated predictions about customer interests by collecting shopping behaviour data of similar customers.

This analytical solution can help retailers in developing targeted product recommendations for customers. Doing so can lead to an increase in the wallet share of customers and improve customer experience and loyalty.

A typical example of product recommendation is the instant suggestions given by various e-commerce websites as soon as a person selects a product. They present a list of similar products under the heading 'You might also be interested in.' This helps customers to find meaningful products and helps the organisation increase its cart size.

Social media analytics

Customer conversations on social media platforms can be leveraged by retailers to engage them online and manage their experience in real time. This can also help retailers obtain meaningful insights, which can be shared with relevant functions within the organisation for further action.
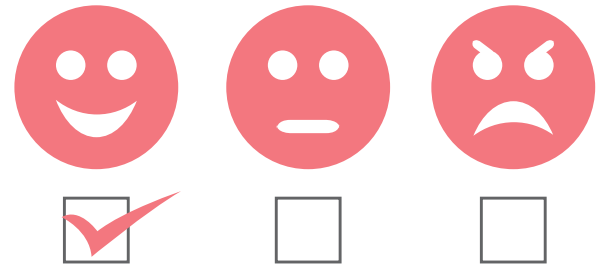
Social media analytics tools consist of web crawlers that can capture unstructured data across multiple social media platforms.

Step 1: Capture customer conversations
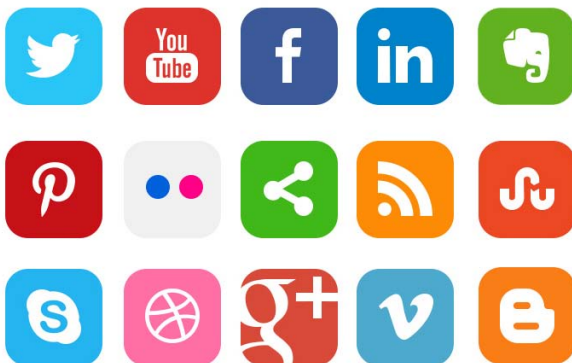
A text mining model then parses conversations into positive, neutral and negative buckets based on their content.

Step 2: Sentiment analysis

Sentiment analysis can help track consumer behaviour in real time across channels and monitor brand health online. Social Mind, PwC's social media listening and analytical app, helps companies learn what customers are saying about them and their competitors. It monitors consumer sentiment so that companies can intervene when needed. Unlike many monitoring services that only sample social media, Social Mind listens to all relevant social media data and client-specified websites.

The app uses advanced natural language processing (NLP) to categorise postings according to a relevant taxonomy. These categorisations involve multiple dimensions that PwC develops with the client. Social Mind's use of NLP allows it to provide a more accurate assessment of sentiment. It compiles this information into visual dashboards for fast analysis.

Customised promotions

Retailers can create customised promotions for their customers based on their product preferences as well as their past responses to similar promotions.

The analytical solution involving regression techniques first identifies customers who are to be targeted and then helps design customised promotions for them.

Step 1: Finding the target set of customers

- Age
- Income
- Location
- Average ticket size
- Previous campaign response
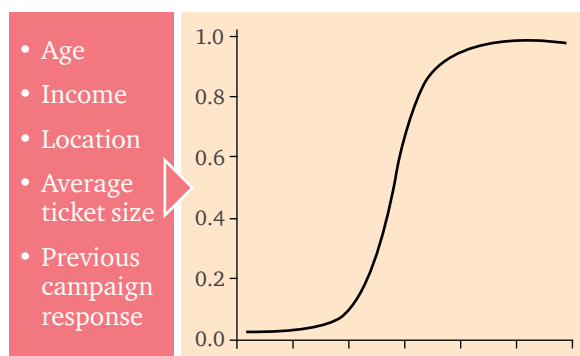
The model uses different variables, ranging from customer demographics, purchase records and coupon redemption history, to identify the customer set that is most likely to respond to the planned marketing stimulus.

Step 2: Sending the customised promotions

5% off

The targeting solution involves designing customised coupons and offers for customers belonging to various groups.

This not only helps increase the campaign's response rate but also enhances customer experience through improved relevance of promotions. Additionally, the retailer is able to achieve a higher ROI from its marketing activities—higher incremental sales by targeting a smaller but 'interested' set of customers.

With the digitisation of processes, retailers have benefitted immensely from the implementation of such analytics solutions. Digital touch points such as electronic POS, mobile applications, websites, customer loyalty programmes and interaction with retailers on social media help gather customer-related data that can be translated into valuable insights.

Online retailers, for instance, have built their enterprises around click stream analysis. Features such as 'You may also like...' and 'Customers who viewed this product also viewed…' effectively encourage the customer to continue exploring the brands' collection.

Brick-and-mortar retailers are also acting on insights obtained by analysing customer purchase histories. For instance, after purchasing a pair of shoes from a physical retailer, one inevitably receives regular SMS and email announcements pertaining to new product launches and promotional campaigns.

Personalisation has therefore emerged as an important lever in enhancing customer experience. However, retailers must exercise control on the level of personalisation that they offer to their customers. Social media analytics records personal events such as birthday and anniversary celebrations. In addition, they can capture information relating to a new relationships or break-ups. With retail promotions on social media at an all-time high, it remains to be seen how comfortable customers will be with receiving discount coupons for baby care products after announcing the birth of a child on social media, or with being presented coupons for recreational therapy after updating their relationship status to 'single'?

Helping the retail marketer through analytics

Analytical solutions can help a marketer gain an edge over competition by providing a better understanding of its customers. Also, the marketer can make logical pricing decisions, introduce effective promotional schemes and optimise marketing spend. Three such analytical solutions relevant to the marketing space are presented below:

Customer segmentation

The customers of any business are almost always marked by heterogeneity. It is crucial for a business to be able to segregate them by characteristics that help identify their varying needs and aspirations, and to utilise this knowledge to improve the relevance of marketing stimuli.

Step 1: Identifying customer segments
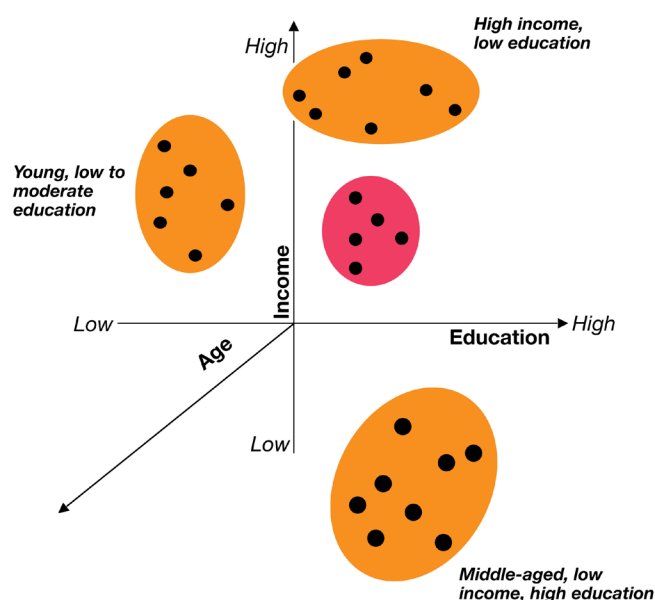
Customer segmentation is an analytical solution that identifies distinct homogenous clusters in the customer pool based on their demographics and purchase behaviour. These clusters are then profiled to help develop marketing programmes targeted at them.

Step 2: Customising offer by profile

| Sample clusters	Recommendations
35 to 45 year old women on Mondays, in Mumbai	Premium cosmetics
10 to 15 year old children during April, in New Delhi	School accessories

Segmentation provides a deeper understanding of the customer base as well as of the different customer types and their distribution. Also, it enables more personalised targeting of customers based on their cluster attributes.

Price recommendation

Retailers can make use of past demand and price data to determine the price that is most likely to maximise the overall revenue and margin.

Step 1: Determining price sensitivity

Demand vs price difference: Washing powder X
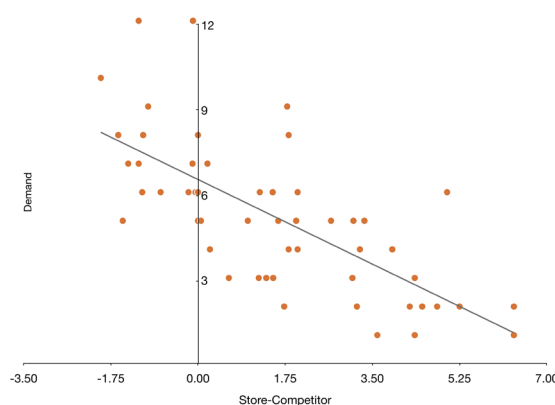
Such price recommendation solutions deploy regression techniques to determine price elasticity, or the varying impact of discounts on sales of products, discounting for the effects of seasonality and special events.

| SKU	Suggested discount on MRP as on 11 December 2014
Brand X: Quick wash (500 gms)	3%
Brand Y: Detergent (500 gms)	11%

Pricing solutions help develop planned discounting schemes by indicating products that are elastic enough to offer heavy discounts in order to attract greater footfall, as well as those that are inelastic and can earn a higher percentage of profit , resulting in increased overall revenue and margin.

Campaign budget optimisation

Analytics can help retailers with campaign planning. They enable allocation of budget towards offer costs in a way that is most likely to maximise the profitability of loyalty campaigns.

*Step 1: Allocating budget across months*

Budget allocation across months: Optimised vs actual
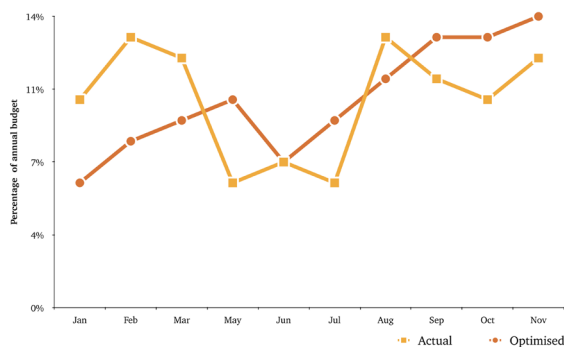
The solution involves using optimisation algorithms to allocate the budget across months and customers segments. This is done by defining an objective function based on the business goal (to maximise annual campaign ROI, for example) and considering the budget constraints based on various what-if scenarios. The model then compares the expected ROIs from various what-if scenarios to recommend the optimal budget structure.

Step 2: Allocating budget among segments

Budget allocation (July 2014): Actual vs optimised
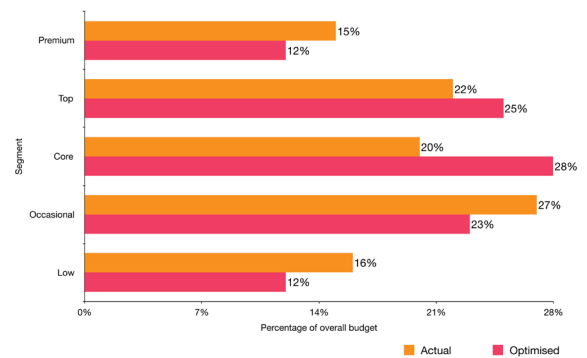
The optimisation exercise not only recommends the best budget allocation structure but also illustrates the expected results from multiple other scenarios, should they need to be considered for any additional business reason.

Using analytics to streamline supply chain

Vendor, inventory and shelf-space management have always been the prime avenues for a retailer to improve on overall cost effectiveness. Analytics can not only help achieve a desired reduction in costs but also improve sales through optimal display of products based on demand and profitability. In addition, it prevents opportunity loss from out-of-stock scenarios.

Vendor selection model

Vendor selection, a key decision in the retail value chain, often tends to be subjective and bias prone. Retailers can however make use of past data to judge and compare vendor performance on a more objective basis.

Step 1: Defining evaluation criteria
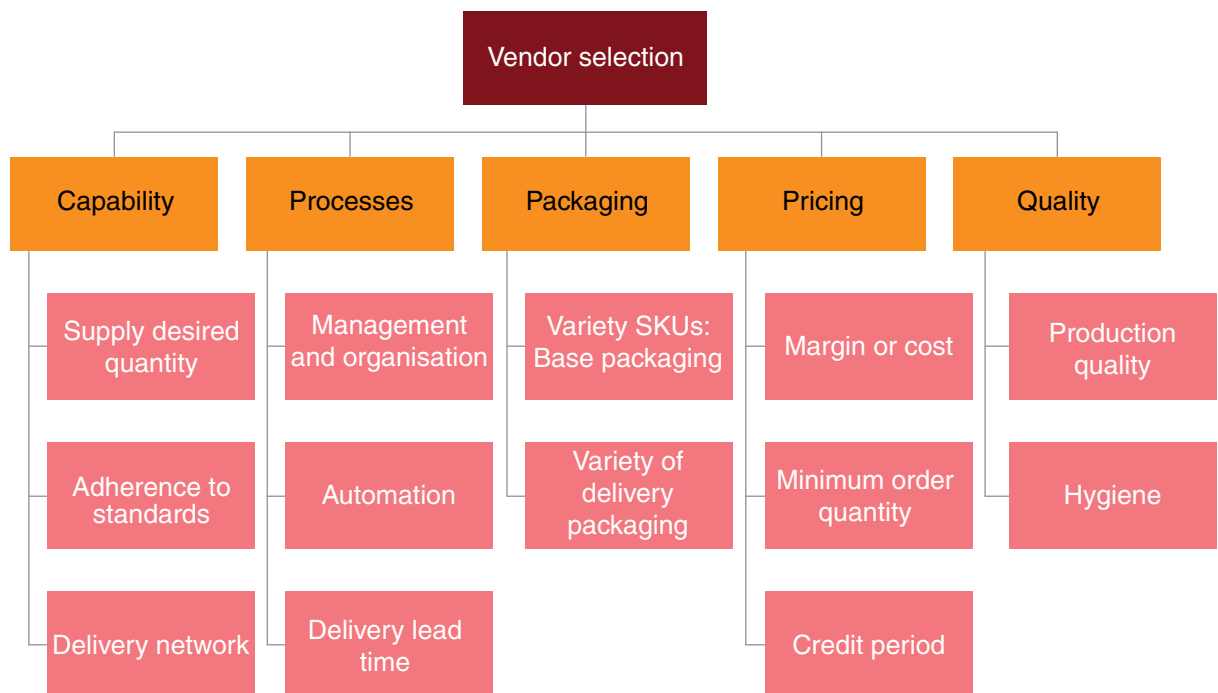
The analytic hierarchy process (AHP) model incorporates judgments on qualitative and quantitative aspects. Thus, it enables multiple evaluators to make rational choices from among multiple alternatives based on multiple relevant criteria.

Final score comparison
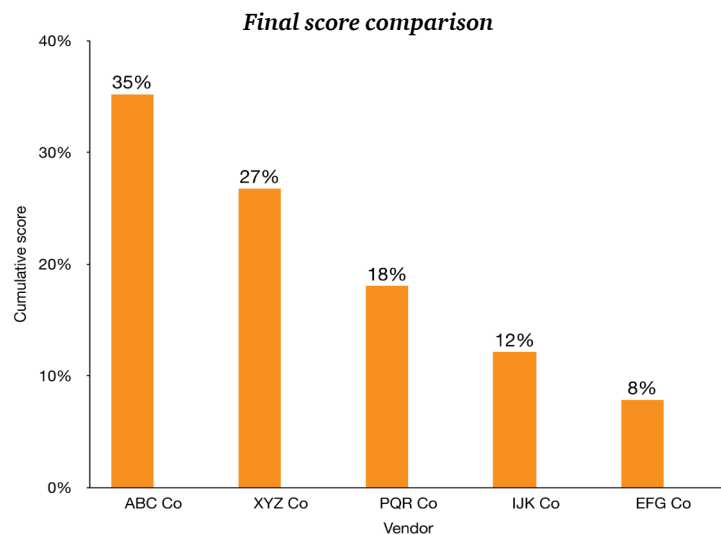
The AHP model facilitates collaborative decision-making. The aggregated results, which are perceived to be more neutral, find greater acceptance across the organisation. Additionally the model can be used as a tool for vendor negotiation on specific business aspects.

Inventory planning

Inadequate inventory planning can lead to frequent stock-outs (loss in revenue) and over-stocking of products (rise in costs). Retailers can avoid these scenarios through accurate estimation of future demand and maintenance of optimum inventory levels.

Step 1: Identifying factors affecting demand
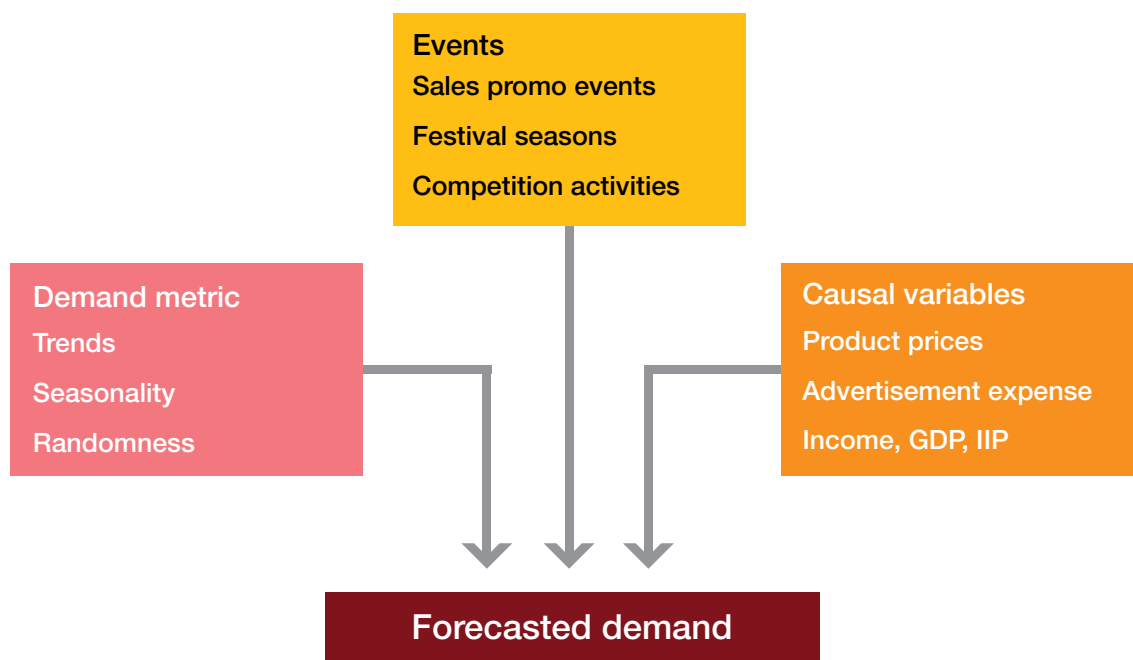
The solution is based on a combination of time-series forecasting and regression techniques that account for the effects of seasonality and time. These include related demand trends as well as the impact of demand drivers such as price, economic environment and festive events. As a result, it is possible to obtain estimates of future demand across different product offerings.

----Actual ------Fitted
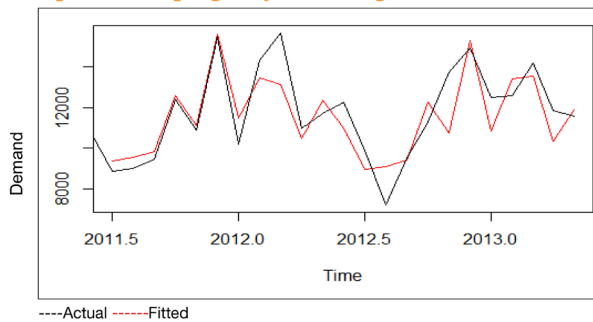
Demand forecasting can provide precise future sales estimates that help optimise inventory, leading to significant reduction in under and overstocking.

Assortment optimisation

Marketers can use past assortment and shelf-space allocation data to determine appropriate product inventory, the right depth of products on shelves and the optimal width of their varieties.

Step1: Analysing past assortment data

SKU	Revenue (In 1000 USD)	Sell-through rate	Margin percentage	GM (In 1000 USD)
A	34	87	46	15.6
B	22	100	48	10.6
C	19	69	46	8.7

The solution is an optimisation engine that provides recommendations on assortment inventory and shelf-space design based on comparative analysis of the financial impact of different assortment scenarios. The effects of product cannibalisation, pricing and promotions, and local product preferences are also accounted for.

Step 2: Streamlining shelf-space allocation

Assortment optimisation helps improve store sales by ensuring the right display of products across shelves and preventing loss in revenue from stock-outs.

Challenges and pre-requisites for success

Irrespective of the nature of solution being considered, there are some common deterrents that a retailer must overcome as a pre-requisite for implementing an effective analytics practice within the organisation.

I. The biggest bottle-neck towards implementing a data-driven system is often data itself, or the deficiencies in its accessibility, quality, accuracy and completeness. The EIU survey indicates that the severity of this challenge is more pronounced in the emerging nations as compared to the advanced ones, as executives from Africa, Latin America, Eastern Europe and the Middle East listed it as their top concern. Many leading retailers have resorted to sophisticated data management systems such as **enterprise data warehousing** (EDW), as a solution. EDWs, for example, not only facilitate streamlined access of data for analysts, but the integration of data across functions such as marketing, finance and supply chain as well.

II. **Data bias** is another major impediment to accurate decision-making that analysts need to guard against.
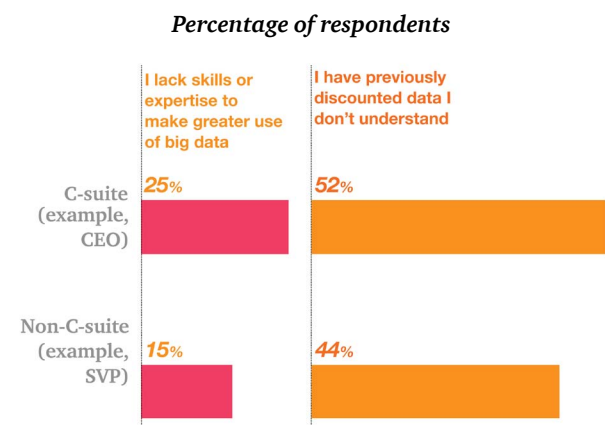
To illustrate this conundrum, let's consider a marketer who plans to launch a health drink for the middle-class working population in Mumbai. The marketer conducts a survey in order to understand the preferences of its target audience. This survey covers respondents from households located in only Bandra and South Mumbai during weekday afternoons. The analysis of such survey results will offer an inaccurate opinion on the preferences of the target population because majority of the respondents are:

1) Financially affluent, and belong to the upper/upper-middle class segments (location-induced bias)

2) Homemakers or non–professionals (time induced bias)

Hence, it is critical to be prudent while analysing data, ensuring thorough awareness of underlying assumptions in the data to ensure usefulness of the results from its analysis.

III. The other key criterion for successful usage of data towards decision-making is the **management's orientation** towards analytics; both in terms of their understanding in order to be able to ask relevant questions related to the data, as well as their inclination to base decisions on answers derived from the ensuing analyses. In the absence of such alignment, utilisation of insights will naturally be below par, and the funding of resources necessary towards setting-up of a streamlined analytics practice, considerably less prioritised.

The existing gap in skills is well quantified by the survey results, tabulated as under:

Percentage of respondents

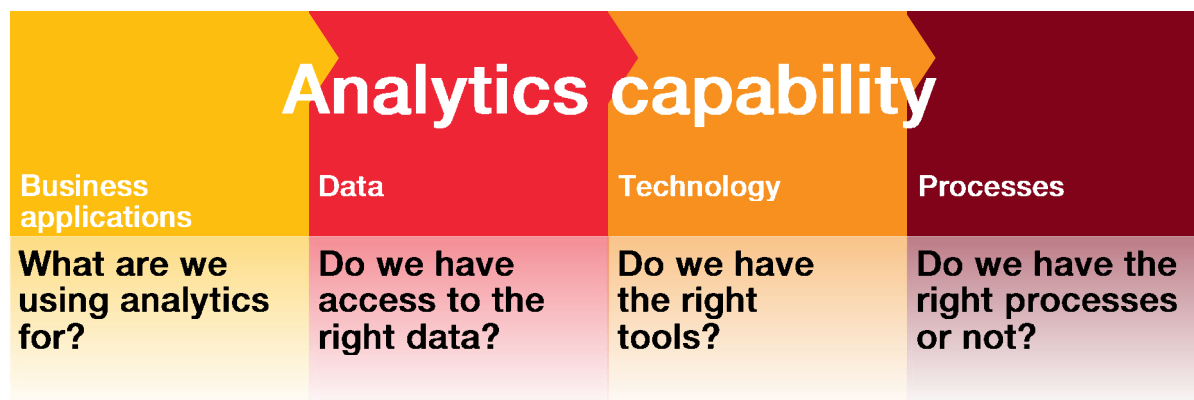|	I lack skills or expertise to make greater use of big data	I have previously discounted data I don't understand
C-suite (example, CEO)	25%	52%
Non-C-suite (example, SVP)	15%	44%

The survey results also reveal that the management's intuition and experience continues to be the biggest factor towards making big decisions (58%).

In an ideal scenario, however, experience and intuition, as well as data and analysis need to not only co-exist, but reinforce each other. The goal for any business should be to marry the two via synergy between the management's desire and patronage to develop an analytics-friendly environment, and the analysts' endeavours to facilitate the use of data insights for decision makers.

Analytics capability building in the organisation

Analytics in retail organisations is typically scattered throughout the enterprise, resulting in redundant costs and sub-optimal adoption. These prevent organisations in achieving the scale necessary to fully nurture analytics talent and make the most of their data.

The first step for retailers is to do an internal assessment based on the following areas:

Analytics capability			
Business applications	**Data**	**Technology**	**Processes**
What are we using analytics for?	Do we have access to the right data?	Do we have the right tools?	Do we have the right processes or not?

- **Business applications**: Understanding where analytics is currently being used and what is the maturity level of analytics usage across functions
- **Data**: Understanding how various applications capture and generate data, internal as well as external; and how sophisticated the use of unstructured data is
- **Technology**: Enlisting technologies that exist for data consolidation, storage, ETL, discovery, pre-processing, modeling and data quality management
- **Processes**: Finding whether the management and governance processes are optimal or not

Based on the organisation's performance in these areas, retailers can ascertain their maturity in analytics and define an appropriate roadmap for the future.

The best way of realising the benefits of analytics is by pooling in a dedicated team of business analysts, statistical modellers as well as data analysts and establishing an analytics centre of excellence within the organisation. It can be a one-stop shop for all the analytics requirements across the various functions. This will help in establishing analytics as a recurring process and ensuring that the best practices are continuously refined and promoted. However, it is also important to understand that the relevance of the analytics department is dependent on the adoption of analytics throughout the organisation and how quickly they provide feedback.

In order to successfully embed analytics in an organisation, it is important to create linkages between application workflows, business intelligence reports as well as analytical models. For example, for vendor selection, approval will come after someone looks at the vendor's performance reports and vendor selection model. This enables adoption of the prescriptive decision-making process driven by analytics. Using embedded analytics can help the business executives in taking the best decision concerning their existing workflows.

A change management exercise is also required in order to convince various stakeholders across the retail organisation about how analytics can help them make better decisions.

Conclusion

Retailers are under increasing pressure due to the ongoing economic uncertainty as well as greater competition and are required to be more responsive to the demanding customers, suppliers and other stakeholders. This paper talks about the various analytical models that can help them improve business results, increase revenue, lower costs, as well as improve customer satisfaction with a focus on improving performance at all levels.

These analytics models can help retailers improve their customer experience, streamline their supply chain and take informed marketing decisions which will enable them to achieve the desired competitive advantage.

Analytics can help them find an effective solution for their business problems, such as improving inventory planning, identifying the most profitable customers and retaining them, increasing supply-chain efficiency, as well as being more responsive towards customer needs. It can also identify their root causes, estimate future sales and suggest possible scenarios.

To be successful in the current competitive landscape and maximise the return on investments, organisations will have to devise a plan that is driven by deep business insights. This will entail a much more detailed comprehension of customer information and business operations than ever before, and this is what analytics intends to, and can achieve.

A comprehensive analytical programme will include descriptive, diagnostic, predictive and prescriptive capabilities that will enable retailers to deliver superior results by enhancing the executive business decisions taken while implementing predetermined strategies and plans.

The use of analytics has been highly disruptive across retail globally, affecting not only the revenue and cost structures but also shaking up the core business and operating models. Retailers may invariably face certain challenges in building analytics capabilities in the organisation. Instead of focusing on the technology initially, the core capability dimensions that need to be addressed at the onset need to be process, culture and resources.

Leadership and executive sponsorship is critical for enabling as well as driving the cultural change necessary. Nurturing analytics talent (communities of practice, career paths) is essential for attracting and retaining data science specialists.

If an organisation can successfully develop an analytics roadmap and overcome adoption challenges, it will certainly make a difference and become a game-changer in its quest towards delivering successful outcomes for its stakeholders.

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About our Retail and Consumer practice

Our India Retail and Consumer practice has been working with the Fortune 500 companies, helping them enhance value. Developing the market entry strategy for global companies, location assessment based on the target audience, streamlining the supply chain and distribution system, deploying IT strategy, linking customer data using analytics, managing the inventory and ensuring customer delight are among the gamut of services we offer our clients to help them in their journey to success.

Our clients in the R&C goods sector operate in different formats ranging from supermarket chains to food and beverage manufacturers and from luxury goods retailers to consumer packaged goods manufacturers, and agribusiness companies.

About our Analytics practice

Our Analytics practice has been working with leading organisation across the globe, helping them with strategy and needs assessment, benchmarking, process management, vendor and tool evaluation, model implementation, financial modeling, analytics competency centre set-up as well as support and change management.

We have executed multiple projects across retail and consumer, insurance, banking, private equity, manufacturing, mining and utilities, telecom, automotive, healthcare, pharma and government sectors.

We are experts in implementing analytics solutions through leading market tools, by aligning them to the client's technology landscape.

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