Application of Big Data Analytics in Marketing

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Abstract: **This Research paper dwells into application of Operations Research into Marketing. Operations Research has implementations of LPP, Network Analysis and Big Data Analytics in Marketing and its branches like digital marketing, social marketing etc. of which we have used Big Data Analytics as a tool to know the impact that data driven marketing strategy has on the concerned companies. We have identified the critical problems faced by marketers in the process of using big data for their marketing strategy and the suitable solutions to tackle the same. We have analysed the impact of data analytics on marketing strategy and in extension the positive change it has on the revenue streams of the company. We have studied how companies use the data after collection and how do they optimize their workings on this basis. The broad strategies like targeting and segmentation is also data driven and so is the advertisement and recommendation strategy on online platforms. We have taken use cases of various prominent companies to illustrate how they use this asset of theirs to increase their productive output and market reach. Lastly, we have also mentioned about the data management platforms which these companies use in order to store, analyse and classify the data they have collected and how it impacts their overall marketing efforts.**

Keywords: **The Research Paper is a beginner's overview of how big data analytics works and how it is implemented in day to day marketing policies.**

I. INTRODUCTION

Large and Complex data sets that can't be dealt by the traditional data processing application software, are termed as Big Data. What you mean when you say, 'Big Data' is 'Lots of Information'. It is a term which has recently been coined but has been present since time immemorial but how big is big data in data terms? One Exabyte (1,152,921,504,606,846,976 bytes) could equal trillions of records about millions of people.Big data analytics is the procedure of examining huge and varied data sets to reveal hidden patterns, correlations, trends, preferences and other information, enabling organisations to make more-informed business decisions. Big Data Analytics is driven by specialized analytics systems and software, which can figure out ways to various business benefits, namely, new revenue opportunities, more effective marketing, better customer service, improved operational efficiency, and competitive advantages over rivals. Analytic Professionals, such as, Data scientists, predictive modellers, statisticians and others use big data analytics applications to analyse growing volumes of structured transaction data, other forms of data that are often left untapped by conventional business analytic programs. With today's technological advancements, it's possible to analyse data and come to conclusions from it immediately – an effort that's sedate and less efficient with more traditional business intelligence solutions.

II. BENEFITS OF BIG DATA IN MARKETING

According to a recent global survey big data will improve the performance of their company / firm by 41% over the coming 3 to 4 years as believed by business executives. Businesses are now able to track human behaviour to an unexpected degree. -Cause and effect relationship is much easier to establish. -They can identify relationships that were previously simply not possible. They are able to identify human characteristics in new ways.

1. Improved content received on the marketer's end: Marketers frequently had to do guess work as to the demographics of their ideal market segment, but that is no longer the situation. With big data, companies can easily see exactly who is buying what and get out even more details about their customers, including things like which websites they frequently visit, which social media channels they make use off, and even which buttons they click while on a website. Efficient data management can induce the customer in order to purchase the product sooner or later and hence this helps in increase of sales. The ROI of a blog post used to be difficult to measure, but now, due to big data analytics, marketers can easily analyse which pieces of content are most effective at moving leads through a marketing and sales funnel. Even very small businesses can make use of big data if resources are optimally utilised.

2. Improve customer engagement: Data can provide details as to who your customers are, where they are, what do they want, how frequently do they make purchases, when and by which means they prefer to be contacted, and many other integral factors. Companies also can analyse how users use their website – or even at their retail outlets – to improve the customers experience. Amazon asks their customers on their app as to how would they like their executives to reach them, by way of emails, calls or text message. Big data combined with automated algorithms gives marketers an opportunity to personalize their offers to individual customers in no time.

3. Boost customer loyalty and retainment: Many retailers have implemented membership / points/ loyalty card systems that track a customer's purchases, these systems also can track which promotions discounts that are most effective in encouraging a customer (both individual and a group) to make an additional purchase.

4. Competitor analysis: New monitoring tools make it easy to accumulate and analyse data about your competitors and their marketing efforts as well, then these companies can make use of this information to have a distinct competitive advantage.

5. Increase the marketers reach: Data analysis helps in increasing the marketers reach as he can now focus on a large group of customers instead of a small one when the marketer carried out analysis manually and hence now allows the marketer to get a larger and a better picture of his market.

6. Increase sales: Efficient data management can induce the customer in order to purchase the product sooner or later and hence this helps in increase of sales.

7. Brand management: Companies can easily monitor mentions of their brand across many different websites and social channels to find unbiased opinions, reviews, and testimonials about their organization and products. The un-savvy bunch of people can also use the medium of social media to provide customer service and create a trustworthy brand presence.

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III. PROBLEMS FACED BY BIG DATA

The current trend towards focusing on predictive algorithms whilst useful is limited to very specific business challenges. Also, the current discussion is based around a very out-dated & redundant model of humans which takes no account of the day to day (inner life) of humans. Humans are complex, subtle and sophisticated creatures thus requiring data analytics approaches to take into consideration the understanding that behavioural science offers. Another problem is that many a times data received by the marketers is incomplete or is not filtered properly.

The problem with analytics is not just restricted to marketers not focusing in the correct ways. A lot of companies use prospect data that is incomplete or invalid. Incompleteness of data stalls marketing operations by preventing marketers from extending their contact base and building the proper image of the customer.

There is also: inappropriate management of data and improper maintenance, and lack of unified data storage and quality control. It is estimated that poor data quality can cost companies 30% of revenue or more annually. Dirty or inappropriate data can disrupt the entire revenue flow of an organization, and with a strong need to fill the funnel, bad data is seeping into our marketing & CRM systems.

IV. SOLUTIONS

Marketers will be required to deliver a new form of analytics one which brings together the strategic understanding of the consumer researcher with the technology that delivers and allows us to interrogate Big Data. We call this Smart Data.

1. Providing the right skills: There has been speculation about the future of big data analysis regarding the data scientists who would analyse the data. For example, McKinsey estimate that in the United States alone there is a shortfall of 140,000-190,000 people with analytical expertise and 1.5 million managers and analysts with the skills to work according to the analysis of Big Data. The skills mainly required are analysing, comprehending and putting it to the best use.

2. Filter the data: Often there is a percentage of the data which of no use to the marketer and may lead to an improper analysis and hence the marketers need to filter the data which they feel would hamper their analysis (e.g.: when they get vague answers / extreme answers in a survey) it is preferable to ignore such data.

3. Act on the data: As mentioned above, humans are a complex set of creatures and hence to make the most out of the changes in human behaviour the marketers must act on the data and make the required changed in their products in order to increase profits.

4. Follow a step by step procedure: Having a clear defined procedure helps the marketers in many ways, the major one being that there is clarity in the analysis that has been carried out and what is yet to be done, and how much is still remaining and this lets the work flow smoothly without any unwanted deviations.

5. Smart integration of the data: If you don't understand the mind-set of the customer then the fear of Big data never being converted into Smart Data will always hound you. 'Smart Data' and as such the value for marketers is limited. Intelligent integration brings consumer and research knowledge together with Big Data to avoid the risk of chasing the wrong questions and finding false leads. If you understand the underlying assumptions of the analysis then chances of better leads are much better than they would have been. This is not purely adding a qualitative layer to quantifiable Big Data. It's about extracting, manipulating and interpreting Big Data in new ways but with the benefit of the Smart data acting as a guidance to increase in profits.

6. Creating a holistic view of the customer: The customer needs to be seen in the form of a community as a whole and not just as someone who purchases your products, needs and wants of the customers need to be understood by the marketers.

V. METHODOLOGY

Introduction to Data Management Platform (DMP):

To remain relevant in our fast-paced world market researchers need to adapt or face a progressive path to gain a competitive advantage. To achieve this companies are building the capabilities to capture, assess and analyse the overall health of a company's products and services, and the drivers behind it. Traditional research methods are too expensive and time-consuming to be the only method for gathering market insight.

Trying to solve this problem market researchers arrived at the solution i.e. a data management platform (DMP), also called a unified data management platform (UDMP) is a centralized computing system for collecting, integrating and managing large sets of structured and unstructured data from disparate sources. A well designed DMP not only provides access to accurate, consistent, and timely data but also help marketers to use this data from online, offline, web analytics for information to achieve business goals.

How does the DMP work?

DMPs is the heart of digital marketing like an engine is that of a car, but they need a critical element to work on: data (like fuel in cars). It displays personalized content on websites, emails and mobile apps. It targets advertising for customers as well as look-alikes, segments of people with particular demographic attributes. That's the beauty of the DMP it not only nurtures your existing customers but also finds new ones.

The three main functions that a DMP performs are:

1. Import data –The DMP takes structured information from a number of different systems, both internal and external, and organizes it at the individual level.

2. Find segments – You instruct the DMP to target segments that share particular attributes such as males in Florida over 50 who use an iPhone and recently browsed your website. Also, the DMP can get to data vendors and sync up cookies and other IDs from different places to enable you to focus on the correct crowd.

3. Send instructions – The DMP alerts ad networks, web sites and other places about who to target, with what message, on which device

How DMPs collect data?

Your DMP collects data in three ways:

1. On boarding - it takes data you send it and stores it for future use.

2. Tags - it collects information itself from your digital properties, like websites, wherever you put data collection tags.

3. APIs - the all-important server-to-server exchange of carefully formatted data objects.

The sorts of information a DMP gathers can be set into four classifications:

•Web & application information: Collected about your clients who visit your site or potentially application

• Data from your first-party systems: This incorporates important, however exceptionally touchy, client information (name, address, email address, and so forth.) from your on the web and disconnected frameworks — e.g. client relationship administration (CRM) and value-based frameworks.

• Data from your marketing & advertising campaigns: For instance, information from internet searcher showcasing and show promoting efforts.

•Data from second & third-party sources: Data from partner sites and from third-party data providers, for example.

Data collection:

Each DMP ought to enable you to effortlessly gather your first-party group of audience information in one place. This is typically done by putting a solitary tag on your site that brings the greater part of your first-party information into the DMP. Your DMP ought to likewise enable you to import information from outsider information suppliers and different players in the web based publicizing environment, so you can look at these information focuses against your own first-party information in one incorporated place. Ensure you can likewise import 'disconnected' information from your own particular CRM frameworks, so you can investigate in-store practices and past buys and target clients secretly on the web.

Data classification:

When you have all your first-party group of audience information in one place in the DMP, it ought to enable you to rapidly sort out this information into scientific classifications. How you sort out the information will rely upon your business. An internet business website may utilize a DMP to order buy information into sliding scientific classifications, for example, apparel, kids, boys, shoes, sneakers, etc. Characterising your site information into scientific classifications like this is the initial move toward building particular group of audience profiles.

Data analysis:

Once you've ordered your first-party information into scientific categorizations, you can start to dissect it to all the more plainly comprehend client goal. By breaking down information about guests' past buys, snaps, inclinations, and penchant to react to specific offers, you can start to utilize these bits of knowledge to make particular client portions.

Data transfer:

Once you've gathered, grouped, and broke down your first-party crowd information in your DMP, you should then have the capacity to use that information by exchanging it specifically to the biggest advertisement systems, trades, entryways, DSPs, and exchanging work areas to make precise media purchases focusing on your pre-characterized portions. Your DMP should work consistently with the biggest players in the show, pursuit, and social publicizing biological systems.

Scalability:

Today most organizations confront an information downpour. From crowd information, CRM information, battle information, outsider gathering of people information and past, advertisers and distributers have a large number of information focuses available to them. A DMP must have the capacity to scale to a large number of information focuses and investigate these at the same time to convey basic experiences.

VI. APPLICATION

What companies do with your data?

Once the data is collected through online cookies, RSS feeds and basically your online activities and stored in the data centres of big corporations, it can be put to various uses by the companies in different aspects. Some of these are as follows: -

1. Search engine results- Companies like Google and Microsoft utilize personal data to present relevant search results to users. They use data science algorithms to present popular/relevant results to our queries by skimming across the tons of hyperlinks which are available on the World Wide Web. Also, non-search engine companies which are into the business of digital marketing use techniques like search engine optimization to use data collected from websites and present their client's website higher on the search results which obviously garners better response for them.

2. Targeted advertising- It includes but it's not limited to digital banners on almost all webpages and digital bill boards in public places. Most of them are based on the data driven algorithms which are in turn based on past activities and behaviours of users. For example, if one person views a travel related ad on a particular website, another person might view an apparel ad on the same website at the same time simply because their previous behaviour states they are more interested into these respective products and hence meaningful adverts shown.

3. Recommendation system- The analysis engine uses the buying behaviour pattern of the customers to recommend products/services to them sorted according to their relevance and level of interest. A lot of ecommerce companies and subscription based online platforms use this to sort content or products out for their customers. This has a double-edged benefit for both the company as well as the customer. For the customer, the user experience is immensely improved as he gets relevant suggestions amongst tens of thousands of products. For the company, empirical evidence has shown that companies make majority of their revenue and profits from the related products and suggestions tab. This is where it has a direct impact on revenues of the company.

4. Image recognition- Companies use this particular method to know your choices on products or services based on the images that you like or click on and then create an offering customized for you. This enables them to know what kinds of designs or patterns you prefer and what your taste is and thus they provide suggestions on that basis. Additionally, companies like Facebook or Instagram use similar algorithms for face recognition and thus improve your experience of interacting with other people. Hence it enables companies to know intricately about your personal and buying behaviour.

Sector-wise Utilisation:

While the above-mentioned uses are spread across the economy, companies or organisations operating in different industries and providing various kinds of market offerings tend to use one or a combination of these above mentioned uses and here are few of them: -

1. Travel and hospitality- Customer satisfaction is the most important metric for companies operating in this industry and yet it is a very tedious task because firstly they interact with humans which are very difficult to predict and secondly, they have a limited time frame to leave an impression on the customer's mind and hence they use data driven strategies to be able to know what is not liked by customers and take corrective measure. This is widely used by hotels and clubs to know which feature is not really desirable by the customer and what lead to higher engagement.

2. Healthcare- Big medical corporations use it to keep patient records, health plans and other social security related information which may otherwise become very impractical because of the sheer number of patients which visit every day. This leads to essential lines of treatment being developed and tested for better healthcare solutions.

3. Government- The state uses it to keep a track on the criminal activity and records of various criminal offenders and similar to the patient management strategy as mentioned above, they use this data to create immediate and effective counter-arrangements for criminals.

4. Retail- The companies in this segment majorly focus on driving promotion strategies for their customers based on loyalty programs and past buying behaviour which enables them to offer customized product delivery.

Used Cases:

Here are some cases which show how some of the biggest corporations have been continuously using big data analytics to eventually improve their products and service offerings: -

1. Amazon- It has almost all kinds of personal input about the customer ranging across his/he age, demographics and also payment related information. This puts Amazon into a very favourable condition to dominate and lead its category. Besides the usual recommendation based sponsored advert which is provided through the use of marketing algorithms, the company majorly focuses on using this data to improve user experience. Now since the customer representative on the other side knows quite a few things about the user, it improves the kind of customer support company can provide to its customers.

2. American Express- The Company uses data from its customers to predict and utilize future activities based on the past financial behaviour. The company uses historical transactions as inputs for its predictive tests which enables them to provide smart reporting solutions to clients. The company by virtue of being in the industry that it is part of, uses a lot of data to forecast future figures and use them in their promotional campaign as a competitive advantage and USP over others.

3. Miniclip- The digital gaming development and distribution giant uses analytics to know the perception of the people on their games in real time. The company uses a lot of user data to know which particular aspect is liked or rated high by the consumers, and which are notoriously unnecessary which could be removed in future versions of the games, thus improving the overall user experience.

4. Netflix- The online content streaming behemoth has one of the most treasured insights into the viewing habits of millions of people across the globe stretched across various kinds of content. It simply uses it to improve its future content offering by using it to know the demographic outcomes of which content is being preferred in which part of the world and then purchasing distribution rights for similar content for that particular region.

5. Starbucks- The reason why one rarely sees an unsuccessful or less crowded Starbucks branch is because the company tests the outcome for newer geographical areas using the vast amount of behavioural data that is available through direct customer interaction. It is based on the traffic, area based demographic distribution and various other factors. This helps the coffee chain to assess the incremental change in revenues and accordingly whether opening a new store makes sense or not.

VII. CONCLUSION

Hence, marketers should ensure their data is evaluated accurately. You need accurate, updated data that is clean. It's that easy. Follow-ups, intense searches, cross checking and filtering of data processes are all integral to the well-being of today's marketing. In a single word, diligence.

However, it's not only up to marketers to care about data quality. To leverage data analytics business owners should start by investing in proper data management and governance. This can be in the form of people or tools. Cleaning, organizing and being diligent all can have an enormous impact on the ROI of your data analytics. Only after this foundation is laid can some of the pitfalls of bad data be laid to rest. Companies in diverse industries like chemicals, construction, software, and telecommunications achieve great results after big data to. All had large numbers of store keeping units and transactions, as well as a lot of customers from various segments; all of them saw a rise in their profits anywhere between 3-8% from setting prices at much finer product levels. To get the price right, companies should take advantage of big data and invest enough resources in supporting their marketing as well as sales representatives.

ACKNOWLEDGEMENT

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