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General Article

Comparison Analytics: Future Trends and Implications

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Abstract

We identify the future trends of analytics and provide an understanding of them. We explain how they play their part in analytics better than the traditional methods. These include cloud computing, big data analytics, predictive analytics and social media analytics. Also, we state how these can be combined with each other to obtain a better analysis for real time data. We provide examples as to how the implementation of these methods has impacted various organisation and their users. Thus stating that these trends have the potential to develp a promising future in all fields.

Keywords: *Analytics, Cloud computing, Big Data Analytics, Predictive Analysis, Social Media Analytics .*

1. Introduction

The aim of this paper is to study the future trends in analytics, its applications and its impact on the future. Future trends in analytics refer to cloud computing, for accessing and sharing many information sources; big data analytics, for improving insight from structured as well unstructured data; social media analytics, for better understanding the sentiment and behavior; predictive analytics, for getting a clear picture of what's probably going to happen next.

Traditionally, analytics was used to get information and discover pattern in historical data. However, with the rapid evolution in analytics, a shift is starting occur.

The traditional application no longer has any kind of weightage. The future is about the direct application of the data in real time to the current transactions or events.

2. Cloud Computing

Cloud computing is an incredible new paradigm that provides a virtualized infrastructure , in turn, enabling the end-user to exploit on demand supercomputing power without investing in huge construction costs.

The architecture for cloud computing consists of large distributed clusters of low-cost servers with a server virtualization layer and parallel programming libraries. One of the important infrastructure elements of the cloud stack is a storage layer designed to support the following features: 1) scalable, capable of storing huge amount (petabytes) of data 2) highly reliable, to handle failures that occur frequently in large systems 3) low-cost, to maintain the economics of cloud computing, and 4) efficient, to obtain best utilization of the disk, network and computer resources, for data analytics applications (Rajagopal Ananthanarayanan *et al*, 2009).

They strip and replicate the data in huge chunks thus providing extreme scalability and a reliable service (Rajagopal Ananthanarayanan *et al*, 2009).

The scalable infrastructure as a service has enabled plenty of cloud-based data analytics applications to process extremely large sets of data. These are newer applications for BI, video surveillance search, semantic web searches, medical image analysis and traditional data-intensive scientific applications like satellite image pattern matching (Rajagopal Ananthanarayanan *et al*, 2009).

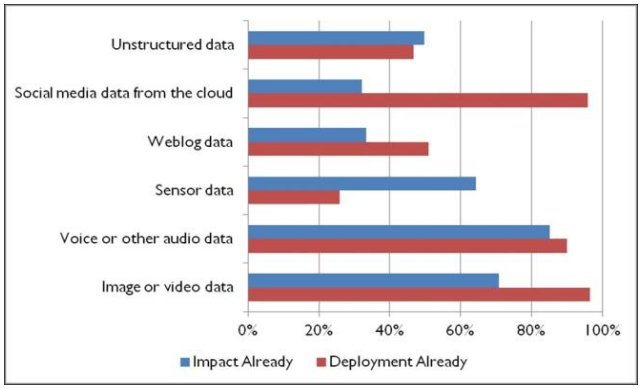

Fig. 1 Graph indicating the deployment in different types of data

Studies have been conducted in order to assess the impact of moving data to cloud. Some of them are as follows:

A cloud based analytic solution was created by a fitness company by building inquiry and buyer models targeting one of its product catalogs. There was a 25% increase in the response rate and a 44% rise in the return on investment as compared to the previously implemented solutions.

A credit card company used a cloud based predictive analytics approach to manage, more importantly target and

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shut down a kind of a fraud in which individuals max out their credit lines all of a sudden and disappear. This approach helped in detecting the fraud three to five days in advance as compared to traditional approaches. By the use of this approach, the card issuer is claimed to have saved a yearly loss of over $40 million.

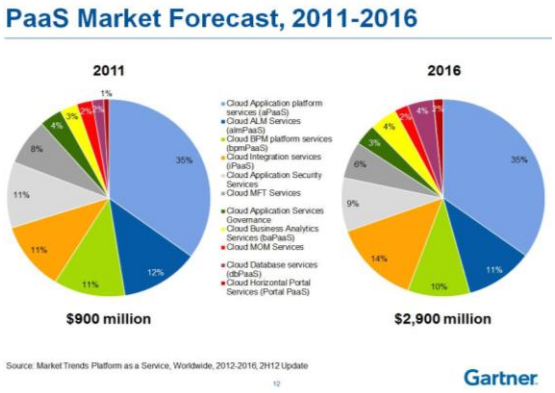

Fig. 2 Contribution of cloud computing in markets

Thus, it is quite clear that cloud computing is playing a major role in predictive analytics which is a promising future of analytics.

3. Big Data Analytics

An old axiom states that the larger the data sample, the more accurate the measurements can be. Big data analytics involves examination of big data and apply analytical techniques such as predictive and prescriptive modeling to uncover hidden patterns as well as unknown correlations and other useful information that can be used to make better decisions.

Data scientists and other professionals can analyze large volumes of data that traditional analytics and business intelligence solutions cannot touch with big data analytics. For example, it's possible that an organization could accumulate billions of rows of data with hundreds of millions of data combinations in multiple data stores and abundant formats. High-performance analytics is important to process data in order to figure out what's important and what isn't.

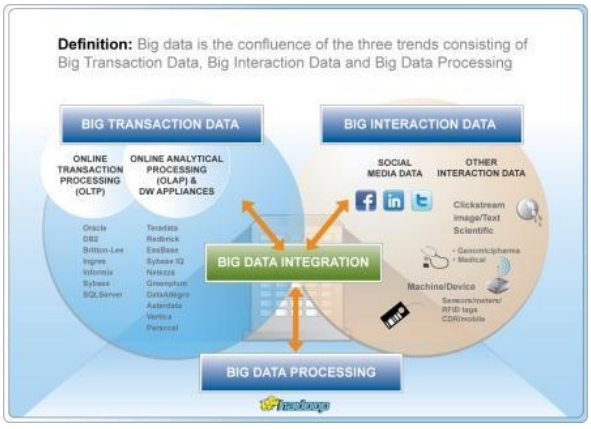

Fig. 3 Steps involved in big data analytics

Why is there a need to collect and store terabytes of data if you cannot analyze it in full context? Or if you have to wait for hours or days altogether to get results? With new developments in computing technology, there's no need to avoid confronting or tackling even the hardest and challenging business problems. For faster and simpler processing of only relevant data, you can use these high-performance analytics techniques. Using such high-performance data mining, forecasting, predictive analytics, optimization on big data enables you to continuously drive towards innovation and make the best possible decisions.

Big data analytics refer to technologies that have their base majorly in data mining as well as statistical analysis. Most of these techniques depend on relational DBMS, OLAP, ETL, data warehousing and BPM (Hsinchun Chen *et al*, 2012).

However, the cost of handling big data can be huge. Leveraging the cloud gives financial control. By using the cloud, they can control their cost of ownership more easily. By putting analytics capabilities along with the data in the cloud, deployment becomes easier, only by using the infrastructure they require, as and when needed by the business.(Jane Griffin *et al*, 2012).

Also, organizations are discovering that some unique properties of machine learning are ideal for addressing their fast-paced big data needs in newer ways.

The new Hadoop and MapReduce-based systems have become a viable option for big data analytics along with the commercial systems developed for RDBMS, in-memory DBMS, column-based DBMS, and parallel DBMS (Hsinchun Chen *et al*, 2012).

The leading three commercial database suppliers-Oracle, Microsoft, and IBM have adopted Hadoop, a few within a cloud infrastructure(Hsinchun Chen *et al*, 2012).

For example, big data is used for tracking inflation online. Similarly, it is used to estimate and also predict changes in GDP in near real-time.

Also, monitor traffic or even a dengue outbreak with the help of big data analytics.

People's sentiments can be analysed to measure welfare by monitoring social media data.

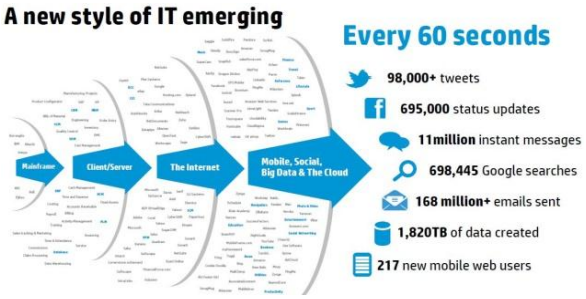

Fig. 4 Contribution of big data in sentiment analysis

Twitter and email data can be studied to understand internal and international migration. Moreover, a rich and growing literature is using CDRs to study socioeconomic levels and malaria spread.

4. Predictive Analytics

Predictive analytics is used in marketing, financial services, communications, travel, retail, healthcare,

insurance, pharmaceuticals and other fields. It includes techniques from data mining that analyze current and historical facts to determine patterns and predict future outcomes and trends. Taking into consideration what-if scenarios and risk assessment, it forecasts what might happen in the future with an acceptable level of reliability. Predictive Model Markup Language (PMML) is a standard developed by the Data Mining Group (DMG) to represent predictive analytic models. This language is supported by leading business intelligence and analytics vendors like IBM, SAS, Micro Strategy, Oracle and SAP.

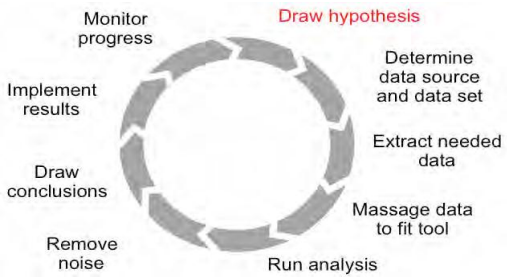

Fig. 5 Traditional predictive analysis process

The figure illustrates the process of predictive analysis. The hypothesis is any assumption that needs to be tested. The data that are needed are identified and extracted from various disparate sources, such as an ERP or CRM system, or coming from the data warehouse. In most cases, the data requires some transformation to fit the specifics of the tool. After removal of all the "noise" in the data, analysis is conducted and conclusions are drawn that lead to changes in for instance customer segmentation or product clustering thus, success of the analysis is monitored. Thereafter, the cycle starts all over. Different predictive analytics tools have different requirements on how to best process the data.

Fig. 6 Predictive model formation

Finding a predictive model is a difficult problem, since there are so many options. For each kind of model, like linear formulas and business rules, there are all the weights or rules or other mechanics that determine precisely how the predictors are combined. Various methods like Bayesian networks, tree augmented Bayesian networks (TAN) , Behavior knowledge space method exist to combine the different classifiers. They should be selected by considering the problem at hand.

The process of predictive analysis and data mining learns from an organization's collective experience by leveraging it's existing logs of customer purchases, behavior and demographics to construct a predictive model. Predictive modeling software has computer science at its core, so explained since there is an undertaking of a mixture of number crunching, trial, and error methods.

Predictive analytics can generate business rules that may make sense, otherwise you could end up with a complex formula that is hard to understand. The choice is up to you, keeping in mind that a simpler. A more intuitive model may not perform prediction as well.

In this era of viral communication, listening to the customers and understanding their needs is crucial, While it has been an established practice to undertake sentiment analysis based on content from call center logs and social media through reporting and dashboards, predictive models can be utilized in social media analysis to listen to the written word. Data mining techniques add tremendous value in this are and help in obtaing a similar feedback around key discussion areas pertaining to the Telco's activities which can be clustered using various algorithms thus shaping a better future.

5. Social Media Analytics

Social media analytics includes adding context to the social media conversations that customers are having on different websites so as to understand, respond to and extract valuable insights from social dialogue. Organizations then infuse this insight throughout their organization to enhance the customer journey across all customer touch points – customer care, brand MARKETING , public and community relations, merchandising and more. With the increase of marketing over the social media, companies are looking towards social media analytics for increasing its profits.

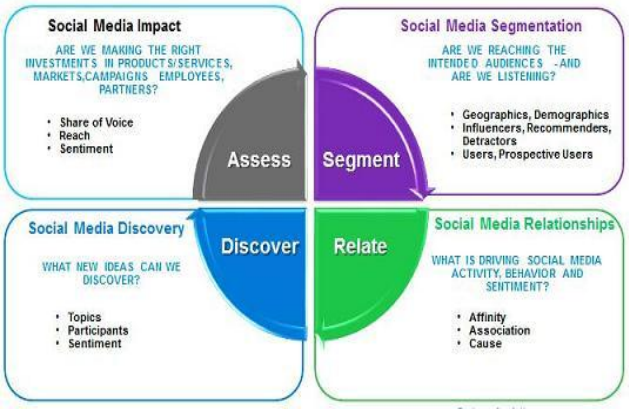

Fig. 7 Steps involved in social media analytics

Social Media discovery is the first step. This can include identifying social websites on which potential customers can be found. For eg. Myntra.com can identify Facebook as a source of potential customers. An assessment of the media is the next step. The potential customers should be in the reach of the organization and should indicate positive sentiments towards it. Segmentation then needs to be done, to group customers according to decision making characteristics. All factors influencing the decision of prospective users need to be considered. Lastly, it is necessary to relate the social media activity to its cause. This should be done to uncover hidden affinities and associations. If a person buys bread he's likely to buy butter. This is an example of an association. Such associations existing between social media should be identified.

For example, Google Analytics has become a great resource for social media analytics on a website. Last year Google added social reports to analytics, which can be used to determine the conversion value of visitors from social sites as well as see how visitors from different social sites behave on a particular site. It also has an "Activity Stream" that shows in real time how people are talking about a website on social networks. All these services were introduced for free.

Considering the rapid growth in the field of social media, with the introduction of analytics, a user's experience can be taken to another level in the future.

Conclusion

With development of new technologies, combing them with other technologies and thereby shifts in analytics with the advancements and utilization of cloud, big data, social media analytics and predictive analytics, data will be more easily and efficiently handled.

Also, the amount of useful data mined with the continuous usage of these techniques will grow with time. Moreover, the costs of analytics will go down substantially with the incorporation of these fields. Thus, analytics is presumed to becoming a popular choice and producing a very technically advanced platform in a few years giving way to a wonderful future in all fields.

References

Rajagopal Ananthanarayanan, Karan Gupta, Prashant Pandey, Himabindu Pucha, Prasenjit Sarkar, Mansi Shah, Renu Tewari (2009), Cloud analytics: do we really need to reinvent the storage stack? *In: Proc of HotCloud*

Jane Griffin, Forrest Danson (Nov 2012), Analytics and the Cloud — the Future is Here, *Financial Executive*,

Hsinchun Chen, Roger H. L. Chiang, Roger H. L. Chiang (2012), Business Intelligence and Analytics: From big Data to Big Impact, *MIS Quarterly*.