A Review on Analytics Tools and Techniques for E-Commerce

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Abstract— Nowadays the ecommerce play a vital role in our day today life .The knowledge of ecommerce   is also a great need for the basic economy in India. The increase in ecommerce is increase the   necessity of analyzing to make the virtual stores in India. The commercial E-Commerce platforms and Business owners recognize that, analytics are an integral part of success. Analytics make more than 110,000 e-commerce websites out there which depending revenue of a meaningful scale. That doesn't even   include the smaller e-commerce businesses that are new to launch, and growing. They all are competing for the attention of different customer, so it is really need to step up our marketing game to be successful. Using B2C like purchasing and ordering experience in current years as they continue their product discovery and buying behaviors to online and mobile.   Research says, in the past decade or so, there have been several changes in consumer behavior .The advantage of sitting at home and comparing   prices , features and products has brought new dynamics to the shopping practice the analytics play a crucial role in ecommerce. The paper aims to observe   the role of analytics tools in ecommerce and it will make a survey of different business analytical tools available for ecommerce.

Keywords— E-commerce, Analytics, Tools.

I.   INTRODUCTION

The growth in technology increases the ease of online transactions in ecommerce To increase the customers in global level each and every business organizations in the need of different environment in their virtual stores. Virtual stores will create a comfort zone for both sellers and buyers. Previous   online shopping zones are basically a collection of photos with products description.   Using virtual reality shops customers can view their products from all the angles and   they can check their products which will suit for them . Almost everything we do, both online and offline, is a source for data. As technology increases, the ways to measure and collect data also increase. One of the ways we understand our world is to study trends in different behavior.

The issue that people run into now, however, is that technology has expanded to the point where we have "too much" data. Organizing, studying and understanding this information has become even more complicated because we're inundated with endless numbers, facts, percentages and perceptions.

E-commerce business owners can take the information from big data and use it to study trends that will help them gain more customers and streamline operations for success. The analytics is the process of examining large data sets containing variety of data types. The analytics often reap several business benefits, including more   effective

marketing campaigns, the discovery of new revenue opportunities, improved customer service delivery more efficient operations and competitive advantages.[2]

The five ways analysis needs to continue changing the face of e-commerce.

Fig.1

1. INCREASED SHOPPER AND CUSTOMER ANALYSIS
Understanding shopper behavior is essential for business success. Big data is an essential component of the process, and provides information on trends, spikes in demands and customer preferences. Business owners can use that data to make sure most popular products are available and being marketed. If customers visit the business organization site to search for products which they don't offer, big data analysis

is used to learn about those searches, helping customers seize new opportunities.

Analysis will continue illuminating important shopper behaviors and patterns, such as popular shopping times and spikes in product searches.
using analysis businesses fine-tuning their marketing strategies, social media advertising and intuitive shopping processes to continue boosting sales and engagement in a competitive market.

2. IMPROVED CUSTOMER SERVICE

Statistics regarding unhappy customers and poor customer service are alarming. For instance, 91 percent of unhappy customers will not willingly do business with a company if they've had a poor customer service experience. Focusing on customer service is crucial to the success of all e-commerce businesses.

Understanding the business shoppers is important, but even more important is making it easy for customers to contact business, resolve issues or find answers to their questions. Big data analysis provides the metrics needed to see how quickly customers are able to complete these tasks.

Data analysis offering way to track customer service experiences and also to add even more predictive monitoring. This will help online companies identify potential problems and resolve them before a customer even gets involved.

3. EASIER AND MORE SECURE ONLINE PAYMENTS

Data analysis has a significant role in making online payments easier and more secure. There are eight different ways data analysis is changing the e-commerce payment industry in 2018:

- It integrates all different payment functions into one centralized platform. Not only does it help with ease of use for customers, it also helps reduce fraud risks.
- The advanced analytics offered by data are powerful and intuitive enough to discover fraud in real time and to provide proactive solutions for identifying risks.
- Data analysis can detect payment money laundering transactions that appear as legitimate payments.
- Recently, payment providers have started realizing the potential of monetizing merchant analytics. Payment providers can help different merchant retailers understand their customers better.
- Data analytics allows e-commerce businesses to cross sell and up sell.
- Push notification-generated sales act as an effective means to validate customer data.

4. CONTINUED ADVANCES IN MOBILE COMMERCE

The number of people who use smart phones is increasing every day, to the point where researchers predict desktop computers will soon become obsolete.
Big data makes mobility possible, especially when it comes to e-commerce. Brands can now collect data from multiple sources and analyze customers through mobile technology.
Google has jumped at this trend, giving preference to sites that are mobile friendly and responsive. Companies who do not have mobile friendly websites will continue to see a decline in traffic to their pages.

5. VIRTUAL REALITY ADVANCEMENTS IN THE RETAIL WORLD

Big data and virtual reality are two of the biggest technological innovations in the world right now, and their connection only enhances their effectiveness. Together, big data and virtual reality are revolutionizing the e-commerce world. They offer the tools needed for businesses to more efficiently present their brand, advertise and offer an evolving shopping experience for customers – right from the comfort of their homes.
Virtual stores can analyze big data and change actions based on its findings, often without the help of a human.

The Role of Analysis in e-commerce

1. **Supply Chain Management**: This includes managing data for products right from warehouse to the customer. E-Commerce industries use analytics extensively to manage Inventory. Also a significant portion of work is into optimizing transportation and pricing of delivery.
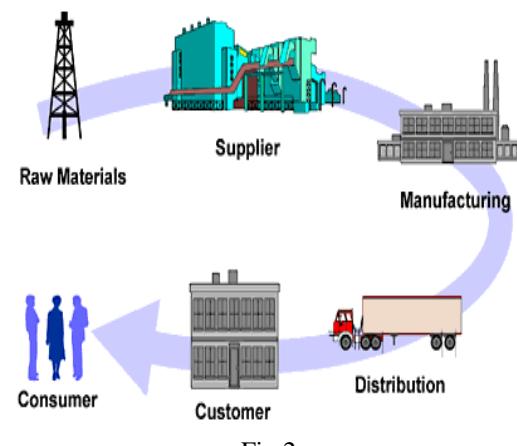

Fig.2

2. **Merchant/Customer Fraud Detection** : Fraud is not excusive to credit card payments however .Criminals are becoming more sophisticated in their use of malware to command online banking logins via phones, tablets and computers using the stolen bank account details to make fraudulent payments. Detection of fraud is fully depend on the analyzing of behavior of sellers and customers. Even

though the E-Commerce company might have nothing to do with this fraud, they are the one who pay for it. However, frauds are not always from the merchant side. Even though it is rare, customers also make false claims in frauds. Initially all these frauds were handled manually, but with time E-Commerce is moving towards developing predictive algorithm to detect frauds and avoid them if possible.

3. Merchant Analytics : Merchants form the core of E-Commerce industry. If the merchant grows, E-commerce provider also grows. So E-Commerce players do extensive analysis for Merchants to get into new markets or set the right price for their goods.

4. Recommender Systems : Recommender systems in E-Commerce industry is not very different from YouTube. These engines serve as blueprint for customer to navigate through the store of this virtual environment. Recommender engines have been the strongest contribution of analytics to technology.

5. Product specific analytics : These teams generally work on product specific details for example – Satisfaction rate of customers for a product, forecast of sales for a product etc. Their work cut across verticals and is specific for a family of product or a single product.

6. Online Marketing Analytics : As E-Commerce provides a virtual environment to buy stuff, they have to market on the virtual environment extensively. The online marketing team generally works on bidding for ads on Google or other websites. They analyze the funnel of new prospect customers and maximize the likelihood of a customer clicking an ad.

7. User Experience Analytics: This probably is the biggest task for analytics in E-Commerce industry. It's all about customer centricity because of the ease to shift from Amazon to Flipcart. This team primarily works on creating the right architecture of the website. This will include how is product searched across portfolio, what decides the rank ordering of products for a particular search, what is the best landing page of a customer coming from Face book etc. They also test what type of layout is better for what type of customers.

II. ANALYTICS TOOLS AVAILABLE FOR ECOMMERCE

1. **Piwik** is an open source alternative to Google Analytics with practically identical feature set. With clients like Forbes, Sharp, T-Mobile etc., it makes a serious competitor to the paid products. Piwik provides all the functionality you might need to gain an insight into your site performance and measure goals. It is available in free and paid versions - downloadable and hosted correspondingly.

Benefits
- E-Commerce tracking (products, orders, cart update, product and category page views)
- integration plugins for Magento, Prestashop, Zen Cart, VirtueMart and osCommerce
- advanced e-Commerce reports, including e-Commerce activity log (visits that lead to conversion and abandoned shopping carts etc.)
- easy to use
- fast operation

Cons
- lacks advanced reporting capabilities

Piwik is an excellent choice for users who search for a quick, intuitive and free analytics tool that possesses functionality needed for e-Commerce analysis and reporting.

2. Kissmetrics is a popular and widely used business analytics tool. It is known for being particularly good with building funnels that are easy to interpret. One of the unique features by Kissmetrics is path report, singling out the most common steps between the first visit and a conversion, so one may get a funnel one never knew about. Although real time tracking is limited to live view, Kissmetrics provides valuable insights into customer behaviour over time with Cohorts, which can reveal trends and tendencies.

Benefits
- Innumerous integrations with third party tools, including Shopify, Magento and WooCommerce
- Ability to create path reports
- Tracking visitors or events by adding a URL parameter to a link
- User search function, showing a complete user profile and action history

Cons
- Expensive

Kissmetrics is a great choice for companies with the need to track people and enough budget for that. It also does a great job with finding the leaks in the funnels, so if your customers for some reasons don't convert into buyers, this tool may help find out the reason.

3. RJMetrics is a SaaS business intelligence and analytics solution with an emphasis on e-Commerce. It attempts to stand out by easily integrating a number of marketing and analytics tools under one "roof" to facilitate the process of gathering data and making conclusions. You will see what channels bring you maximum ROI, better understand customer behaviour, find out what the least and most profitable segments are.

Benefits
- integration with Magento and Shopify shopping carts

- customizable dashboard
- intuitive interface
- MySQL, MSSQL and Postgres databases support
- real-time data visualization updates
- pre-built analytics packages for specific tasks

Cons
- no exact pricing info

If you're unsure whether RJMetrics is what you need, there's a free trial available to try it out.

4. Clicky is a very popular analytics system created to serve small and mid-size businesses. It presents a rich set of features, ease of use and -- its major pride -- real time monitoring. Clicky provides all the data immediately, so you can react to any changes much faster.

Benefits
- Ajax and Flash events tracking
- Real time goal tracking
- Advanced funnel analysis
- Integration plugins for a number of CMSs, forums and shopping carts like PrestaShop and Magento.

Drawbacks
- can't collect data on the time spent on page, pageviews per visitor etc
- poor event tracking capabilities

All in all, Clicky would be a good choice for companies on a shoestring budget, and for those monitoring Ajax or Flash websites as well as e-businesses using Magento and/or PrestaShop platforms.

5. Woopra, once a regular analytics tool, now claims to be a customer analytics system, aggregating data about each of your site visitors and displaying it in a compact and very convenient way. This is done thanks to the AppConnect feature that syncs data from all points your clients deal with in the store - from site to live chat and email.

Benefits
- integration with Magento, WooCommerce, Zendesk, Google Docs etc.
- customer data sync from all sources
- notifications on certain actions on the website, letting you react immediately
- advanced funnel and customer retention reports
- ability to trigger actions in third party apps by setting rules and segments (like, showing the live chat invitation to a client based on the pages viewed)
- real-time tracking

Drawbacks
- the cost grows together with your site

6. Let's start from this giant by Adobe, presenting one of the fullest feature sets for monitoring website visitors, pleasantly combined with an intuitive interface and really easy to use. Adobe Analytics frequently rivals Google Analytics when it comes to choosing an analytics system for a big company. Being an enterprise level software and part of Adobe Marketing Cloud, it is easily expandable to meet all your demands in measurement and reporting.

Benefits
- real time data and reports
- mobile app analytics included
- advanced segmentation capabilities
- easy to expand with the needed functionality (video, social media analytics, etc.)

Drawbacks
- Adobe Analytics is pricey
- The cost grows together with your site

So, if you're just starting up, you might want to look at other solutions, but for big businesses with sophisticated demands Adobe Analytics can make a great asset.

7. Webtrends The pioneer of the industry, Webtrends, was started in the far 1993. In spite of its age, which is ancient in Internet terms, this tool has been steadily growing and developing the capabilities and is now one of the most used analytics systems out there. Thanks to the tier model, Webtrends is suitable for all types of businesses - from small to enterprise, as you can configure the set of options needed and not pay for the rest.

Benefits
- storyboard mode provides data in the easily translatable form
- powerful in mobile and social data tracking
- available in SaaS and on-premise versions

Cons
- quite high price
- no free version available
- data export capabilities are poorer than competitors'

So, if your business is quickly growing and you need a decent analytics tool, but not willing to pay for the bells and whistles you're not gonna use right now, Webtrends might be what you're looking for.

8. Mint The freshness of this tool comes not only from the name and beautiful interface. You will also be pleasantly surprised by the pricing model they use. In fact, you only have to pay a quite small fee ($30) per site at the start and not be bothered by any monthly payments later on.

Benefits
- reasonable price
- self-hosted (downloadable) software - your data is yours only

- highly customizable dashboard
- extensible with plugins ("peppers")
- counts the traffic from image search

Drawbacks
- moderate reporting capabilities
- no tracking for many popular metrics (time on site, conversions)

If you value simplicity and don't expect deep insights from your web analytics system plus don't wanna pay much, Mint can make a good candidate.

III.   SAMPLE ANALYSIS

*A. **Matomo**   is an open analytics platform currently used by individuals and lot of companies and government by all over the world.*

Benefits
1. It is a free and open source software.
2. the owner can collect the data nobody else.
3 .It will support the full privacy requirements.
4. Detailed view of each user action.
5. No data storage limit.
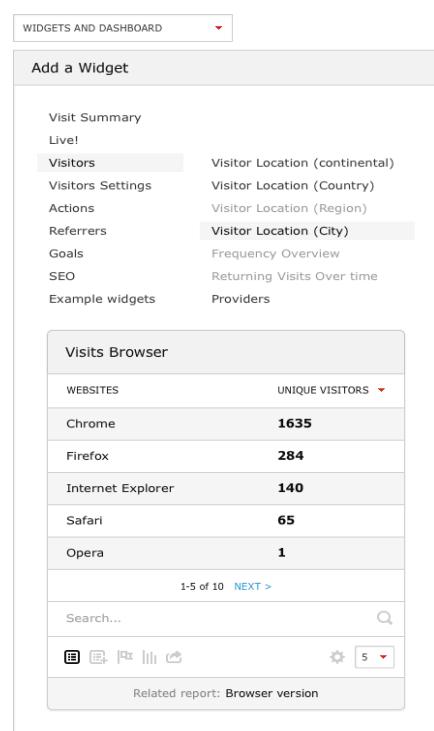
B. Clicky
1. Real time monitoring and tracking.
2. It will track video player and audio player.
3. It has different types of mobile apps and website apps.

4. Advanced funnel analysis
5. Integration plugins for a number of CMSs, forums and shopping carts like PrestaShop and Magento.
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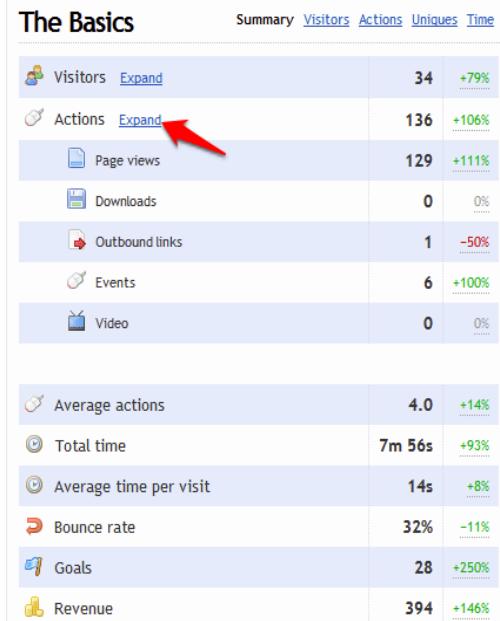
Fig.3

IV.   TECHNIQUE USED IN ANALYTICS TOOLS

All web servers generate access log files which contain all of the requests made to the server. Each log file includes historical information about the activity performed by it (typically by a website's visitor). User can import their server log files into their analytics service and add them as another site on their Dashboard for easy viewing. All user server log files will be parsed, processed and displayed in the same way as the reports from the JavaScript tracking code method.

CLICKSTREAM DATA
Click stream data is also an information trail a user leaves behind while visiting a website. It is typically captured in semi-structured website log files.
These website log files contain data elements such as a date and time stamp, the visitor's IP address, the URLs of the pages visited, and a user ID that uniquely identifies the user.

V.   CONCLUSION

Nowadays E-commerce is the necessary transaction in our daily life. Top business organization needs different types of customer according to their product type. The behaviour of customer also varies according to their environment   and their living space. So the Online transaction needs different way of attraction   for their customers. The huge amount of

data is basic idea of the organizations. This paper discussed about how the analytics tools perform their roles in the life of ecommerce nowadays and discuss about the various analytical tools available .The collected data will be stored and used by the organization for various purposes. In future the particular tools will be taken and the analyzed data will be compared for the best result.

REFERENCES

[1]Likitha Ravi,Qiping Yan,Sergiu M.Dascalu,Fredrick C.Harris "A Survey of Visualization Techniques and Tools for Environmental Data"

[2]Aigner W., Bertone A., and Miksch S., "Comparing information visualization tools focusing the temporaldimensions" 12th International conference on information Visualisation, pp. 69 - 74, July 2008.

[3]NanaKwamegyampi, Princeappiah, "BigDataAnalytics-Survey paper"

[4]Bibhudutta Jena," A Review on data visualisation tools Used for Big Data" International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056 Volume: 04 Issue: 01 | Jan -2017,

[5]Zhao Kaidi," Data visualization" Iscp0075@nus.edu.sg

[6]Alpa K. Oza," Data Visualization for University Research Papers", International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Volume-2, Issue-6, January 2013

[7]Dr.Shahid Amin, Kesav kasana "A review on E-Commerce"