Big Data Analytics Of Global E-Commerce Organisations: A Study, Survey And Analysis

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ABSTARCT: In recent years there has been an increasing emphasis on big data analytics (BDA) in e-commerce sector. However, this domain remains rarely-explored as a concept, which restrained its theoretical and practical development. This position paper is based on exploring Big Data Analysis in e-commerce sector globally as well as on the national level by drawing on a systematic review of the literature. This paper presents an interpretive framework based on exploration of the definitional aspects, distinctive characteristics, types, business values and challenges of Big Data Analytics in the e-commerce landscape. The paper is also responsible in triggering broader aspects of discussions regarding future research challenges and opportunities in theory and practice. Overall, the findings of the study synthesize diverse Big Data Analytics concepts such as definition of big data, types, nature, business value and relevant theories providing deeper insights along the cross-cutting analytics applications in e-commerce.

Keywords— Big data analytics E-commerce Business value

I. INTRODUCTION

For the past few years now, a great explosion of interest in big data has occurred from both academia and the e-commerce industry. This explosion is being driven by this fact that e-commerce firms are injecting big data analytics (BDA) into their value chain experience to gain 5–6 % higher productivity than their competitors (McAfee and Brynjolfsson 2012). A recent study by BSA Software Alliance in the United States (USA) is showcasing that Big Data Analytics is contributing to 10 % or more of the growth rate for 56 % of firms (Columbus 2014). Hence, 91 % of Fortune 1000 companies are readily investing in Big Data Analytics projects, an 85 % increase from the previous year (Kiron et al. 2014a). While the use of emerging internet-based technologies is providing e-commerce firms with transformative benefits (e.g., real-time customer service, real- time analytics, dynamic pricing, personalized offers or improved interaction) (Riggins 1999), Big Data Analytics can further solidify these impacts by enabling informed decisions based on critical insights (Jao 2013).Specifically, if we talk in the e-commerce context, "big data is enabling merchants to track each user's behaviour and connecting the dots to determine the most effective ways to convert one-time customers into repeat buyers" (Jao 2013,p.1). Big data analytics (BDA) helps e-commerce sector to use data more efficiently and effectively , push it to a higher conversion rate, enhance decision making and empower customers (Miller 2013).From the perspective of transaction cost theory in e-commerce (Devaraj et al. 2002; Williamson 1981), BDA can benefit online firms by improving market transaction cost efficiency (e.g., buyer-seller interaction online), managerial transaction cost efficiency (e.g., process efficiency- recommendation algorithms by Amazon) and time cost efficiency (e.g., searching, bargaining and after sale monitoring). Drawing on the resource-based view (RBV)(Barney 1991), we argued that BDA is a distinctive competence of the high-performance business process to support business needs, such as identifying loyal and profitable customers, evaluate the optimal price, finding the quality problems, or deciding the lowest possible level of inventory (Davenport and Harris 2007a). In addition to the RBV, this research views BDA from the relational ontology of sociomaterialism perspective, which puts forward the argument that different organizational capabilities (e.g., management, technology and talent) are constitutively entangled (Orlikowski 2007) and mutually supportive (Barton and Court 2012) in achieving firm performance. Finally, service marketing offers the perspective of improving service innovation models, which has been reflected by firms such as Rolls Royce (Barrett et al. 2015), Amazon, Google and Netflix (Davenport and Harris 2007a). As such, the extant literature identifies BDA as the platform for "growth of employment, increased productivity, and increased consumer surplus" (Loebbecke and Picot 2015, p.152), the "next big thing in innovation" (Gobble 2013, p.64); "the fourth paradigm of science" (Strawn (2012); "the next frontier for innovation, competition, and productivity" (p. 1) and the next "management revolution" (p. 3) (McAfee and Brynjolfsson 2012); or that BDA is "bringing a revolution in science and technology" (Ann Keller et al. 2012); etc. Due to the high impact in e-commerce, notably in generating business

Table-1: Global growth in e-commerce and BDA

value, BDA has recently become the focus of academic and Industry investigation (Fosso Wamba et al. 2015c). Web usage mining is also a critical task [13] but Semantic web [14] is a bit flexible towards BDA. As shown in the following table (#Table-1), there is a steady growth in the BDA market, and in the number of global e-commerce customers and their per capita sales.

Year	Growth in the number of e-commerce customers worldwide (in millions)	Growth in e-commerce sales per customer worldwide (in US$)	Growth in big data analytics (BDA) market worldwide (in billion)
2011	792.6	1162	7.3
2012	903.6	1243	11.8
2013	1015.8	1318	18.6
2014	1124.3	1399	28.5
2015	1228.5	1459	38.4
2016	1321.4	1513	45.3

I. Big data in Indian Ecommerce

Indian e-commerce companies are easily providing greater assistance to its customers. They are able to provide suggestions over upcoming discount offers if in case a customer decides not to buy a particular product because he might have expended his budget.

Personalized assistance is driven by the intelligence provided by Big Data analytics—churning and processing of a large amount of data to draw insights and patterns—is now being treated as the next big thing for e-commerce companies.

Only a few of the companies in India are currently using Big Data analytics to provide its customers a basic personalized experience and making recommendations based on the customer's buying behaviour.

Apart from these personalized recommendations, real-time analytics—responding as client action in real time is acquisition the attention of online retailers as the primary use case where analytics are being deployed.

E-commerce companies use Big Data in two ways. this is to analyse past performance of customers to find patterns, and the other is real-time analysis, that is, reacting when the customer is shopping online.

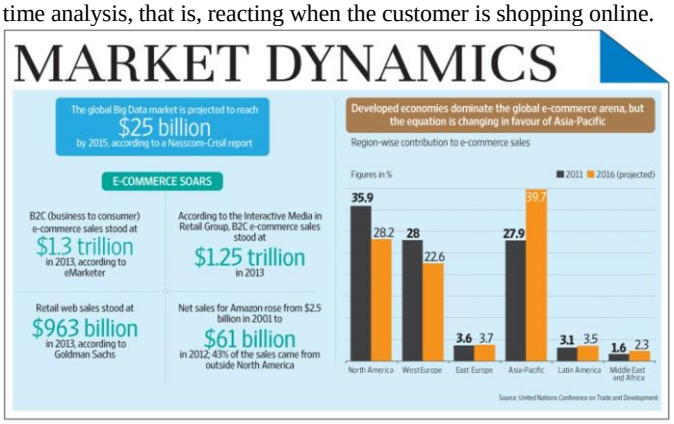

Fig-1 (Picture courtesy: LiveMint)

II. TACTICS DERIVED IN BIG DATA ANALYTICS:

1. A customer planning to take vacations two per year first may be in December in India and another one in June outside the country. If he looks at possible destinations in May within India, I will still want to throw an international destination, so an intelligence around that, which is based on the action at that same moment and may be some linkage with the past history.
2. Similarly, the other thing which some of these companies are looking at is the next best action kind of a step. For example, on any one of the travel sites, if you stay on the site and you aren't doing anything, suddenly an offer pops up saying that Rs.100 off on some offer, because the customer hasn't acted and tries to lure in the customer.
3. Moulding what you want the client to do as the next best step, these are the things which they are doing (or trying to do) on a real-time basis, the deeper you get in each of these use cases, the better it gets.
4. **Homeshop18.com,** a digital commerce platform of the **Network18 Group**, company tracks the entire customer journey, which includes customer behaviour—how customers appearance with site and what products they usually choose, action taken by a customer on the website and how customers navigate the website.
5. **Jabong.com** is using some "elements" like assembling data to gain competitive advantage and insight opportunities which have not been discovered before.
6. **Snapdeal.com**, which has been one of the early movers in Big Data analytics for personalization and recommendation so as to make product searches easier, also said that real-time analytics has become a key focus area for companies.

III. BDA TOOLS USED BY COMPANIES:

- Hadoop, a software from open source software foundation Apache that can process huge amounts of data.
- Rapidminer's customer churn analytics, an open source software best known for sentimental analysis and sociographic analysis.

IV.CONCLUSION

Big data analytics (BDA) has appeared as the new frontline of innovation and competition in the wide spectrum of the e-commerce landscape due to the challenges and opportunities generated by the information revolution. Big data analytics (BDA) gradually provides value to e-commerce firms by using the dynamics of people, processes, and technologies to transform data into insights for robust decision making and solutions to business problems. This has become a holistic process dealing with data, sources, skills, and systems in order to create a competitive advantage. Prominent e-commerce companies such as Google, Amazon, eBay, ASOS, Netflix and Facebook have already embraced Big Data Analytics and experienced enormous growth. Through its systematic review and creation of taxonomy of the key aspects of Big Data Analytics, this study helps in presenting a useful starting point for the application of Big Data Analytics in emerging e-commerce research. The study represents an approach for encapsulating all the best practices that build and shape Big Data Analytics capabilities. In addition, the study reflects that once Big Data Analytics and its scope are well defined; distinctive characteristics and types of big data are well understood; and challenges are properly addressed, the Big Data Analytics application

will maximize business value through facilitating the pervasive usage and speedy delivery of insights across organizations.

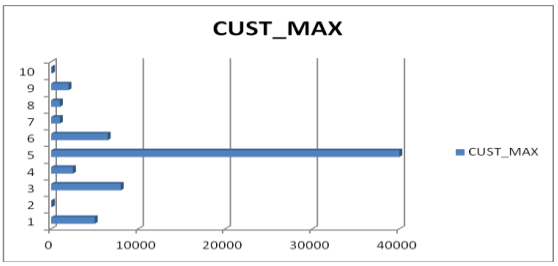

Fig-2: Maximum amount spent by client

Fig-3: Minimum amount spent by client

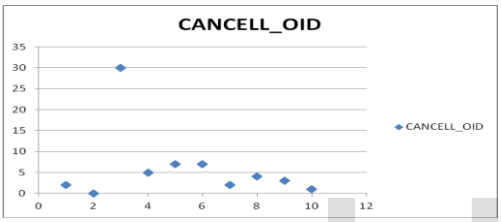

Fig-4: No. of orders cancelled

This research is done on MS-excel by importing csv file of an ecommerce site(dummy).

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