Gevorgyan Levon

BIG DATA IN E-COMMERCE

The article explores the new and innovative solutions of combining e-commerce and big data. It discovers issues which could exist in modern e-commerce firms and brings examples of companies which have already dealt with such problems. Important part of using cloud services for e-commerce firms is the big data analysis-related solutions they offer. Firms can apply these services to do clickstream analysis, real-time analytics, log analysis, predictive analytics etc. Besides, after appropriate big data analysis new correlations can be found which were unknown before. Each of above mentioned usages has real potential to bring electronic commerce sphere companies up and give them significant competitive advantages. Smart usage of big data could even register exponential growth of customers which will lead to more profit. So, the main idea of this article is to show that running business in cloud and using big data analytics tools would be good decision for e-commerce companies, and they'll be able to get big benefits from it.

Keywords: e-commerce, electronic commerce, big data, e-commerce tools, Google, Amazon.

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ВЕЛИКІ ДАНІ В ЕЛЕКТРОННІЙ КОМЕРЦІЇ

У статті розглядаються нові та інноваційні рішення з електронної комерції та обробки великих даних. Вона розкриває проблеми, які можуть існувати в сучасних фірмах електронної комерції, і наводить приклади компаній, які вже займалися такими проблемами. Важлива частина використання хмарних обчислень для фірм електронної комерції – це рішення, пов'язані з аналізом обробки великих даних, що пропонуються. Фірми можуть застосовувати ці послуги для аналізу маршруту переміщення користувача (clickstream analysis), аналітики в режимі реального часу, аналізу файлу реєстрації, прогнозної або передбачувальної аналітики тощо. Крім того, після

відповідного аналізу обробки великих обсягів даних можуть знайдені нові кореляції, які раніше були невідомі. Кожне з вищезазначених застосувань має реальний потенціал для розвитку компаній електронної комерції та надання їм значних конкурентних переваг. Розумне використання обробки великих даних може навіть відзначити експоненціальне зростання клієнтів, що призведе до збільшення прибутку. Отже, основна ідея цієї статті – показати, що запуск бізнесу в хмарних обчисленнях і використання інструментів аналізу обробки великих обсягів даних буде гарним рішенням для компаній електронної комерції, і з їх допомогою вони зможуть отримати великі вигоди.

Ключові слова: електронна комерція, великі дані, інструменти електронної комерції, Google, Amazon.

Геворгян Левон

БОЛЬШИЕ ДАННЫЕ В ЭЛЕКТРОННОЙ КОММЕРЦИИ

В статье рассматриваются новые и инновационные решения по электронной коммерции и обработки больших данных. Она раскрывает проблемы, которые могут существовать в современных фирмах электронной коммерции, и приводит примеры компаний, которые уже занимались такими проблемами. Важная часть использования облачных вычислений для фирм электронной коммерции – это решения связанные с анализом обработки больших данных, которые они предлагают. Фирмы могут применять эти услуги для анализа маршрута перемещения посетителя (clickstream analysis), аналитики в режиме реального времени, анализа файла регистрации, прогнозной или предсказательной аналитики и т. д. Кроме того, после соответствующего анализа обработки больших объемов данных могут быть найдены новые корреляции, которые ранее были неизвестны. Каждое из вышеупомянутых применений имеет реальный потенциал для развития компаний электронной коммерции и предоставления им значительных конкурентных преимуществ. Умное использование обработки больших данных может даже отметить экспоненциальный рост клиентов, что приведет к увеличению прибыли. Итак, основная идея этой статьи – показать, что запуск бизнеса в облачных

вычислениях и использование инструментов анализа обработки больших объемов данных будет хорошим решением для компаний электронной коммерции, и с их помощью они смогут получить большие выгоды.

Ключевые слова: электронная коммерция, большие данные, инструменты электронной коммерции, Google, Amazon.

Problem of research. E-commerce is a relatively new business direction which is used by more and more individuals and companies. On the other hand, big data collection and analysis have become a trend in recent years. So, the problem of the research is to discover how big data analysis tools can be used in e-commerce, how those can affect firms and which services can be used to get maximum benefits from big data analysis.

Analysis of the recent research and publications. The questions related to e-commerce, big data and their relationship are studied in the works by such scientists as Koirala, P., Kauffman, R. J., Srivastava, J., Vayghan, J., Johnson, J. E., Johnson, B. D., Hsinchun, C., Chiang, R. H. L., Storey, V. C., McAfee, A., Brynjolfsson, E., Davenport, T.H., Patil, D.J. and Barton, D., etc.

Unsolved part of general problem. For internet-based companies there are still remaining questions related how both new born and experienced e-commerce companies can maximize their revenue by using big data analysis without huge investments.

The aim of the article. To discover and bring up third-party companies which are specialized in providing big data collection and analysis tools, to show how other companies already have implemented and apply them, and to identify in which cases firms need to go in this direction.

The main results of the study. Purchasing goods and services is the part of people's everyday life. Nowadays there are several options to do that. People can buy things from shops, malls, supermarkets personally. This is the way they used to do it before the era of information technologies. Currently information technologies give both individuals and firms large opportunities in commerce sphere. With help of the Internet firms can suggest their products in any part of the world where people have access to the Internet. As a result, a new term was created – electronic commerce (e-commerce). There are different definitions of "e-commerce":

- e-commerce is a type of business model, or a segment of a larger business model, that enables a firm or individual to conduct business over an electronic network, typically the internet [2].

- e-commerce supposes trading in goods and services through the electronic medium such as the internet, mobile or any other computer network. It involves the use of Information and Communication Technology (ICT) and Electronic Funds Transfer (EFT) in making commerce between subjects of commerce [3].

Countries with the largest B2C e-commerce markets in 2015 and 2016
(in billion U.S. dollars)

■ 2015 ■ 2016 *

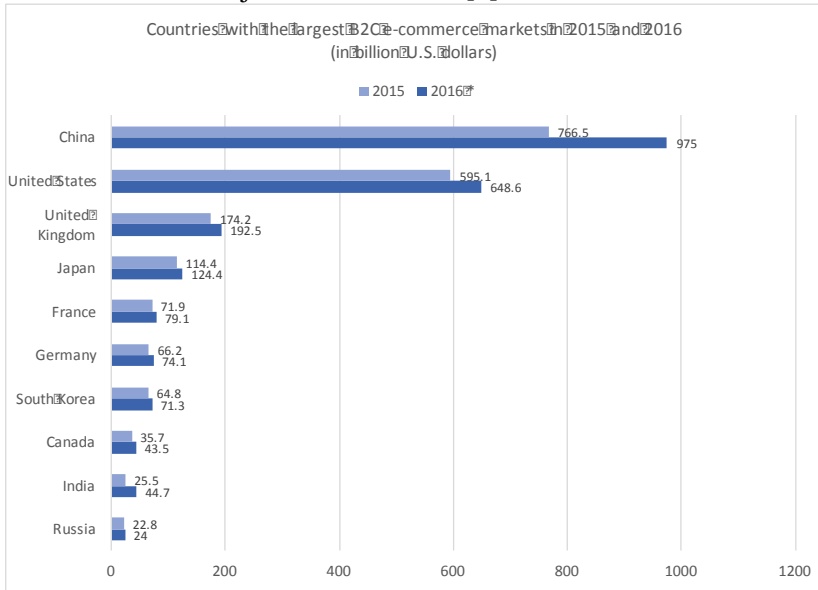| Country	2015	2016 *
China	766.5	975
United States	595.1	648.6
United Kingdom	174.2	192.5
Japan	114.4	124.4
France	71.9	79.1
Germany	66.2	74.1
South Korea	64.8	71.3
Canada	35.7	43.5
India	25.5	44.7
Russia	22.8	24

Figure 1: Countries with the largest B2C e-commerce markets
in 2015 and 2016 [1]

There are following categories of e-commerce:

- B2B (Business to Business) — This involves companies doing business with each other.

- B2C (Business to Consumer) — B2C consists of businesses selling goods and services to individuals

- C2B (Consumer to Business) — In C2B e-commerce, consumers post a project with a set budget online, and companies bid on the project.

- C2C (Consumer to Consumer) — Individuals are online platforms to buy and sell good or services from each other [4].

E-commerce markets are growing fast. Due to Ecommerce Europe's report (Figure 1) in 2015 the largest B2C e-commerce market was in China (766.5 billion US dollars). And in 2016 it would increase about 30% by reaching 975 billion US dollars. According to eMarketer's forecasting (Figure 2) in 2018 e-commerce worldwide sales will reach to 2,536 billion US dollars. This means that e-commerce will involve more individuals and firms in upcoming years. All these developments will generate more data which need to be analyzed. Analyzing that data can allow merchants not only gain deeper insights into customer behavior and industry trends, but also let them make more accurate decisions to improve every aspect of the business - from marketing and advertising to merchandising, operations and customer retention.
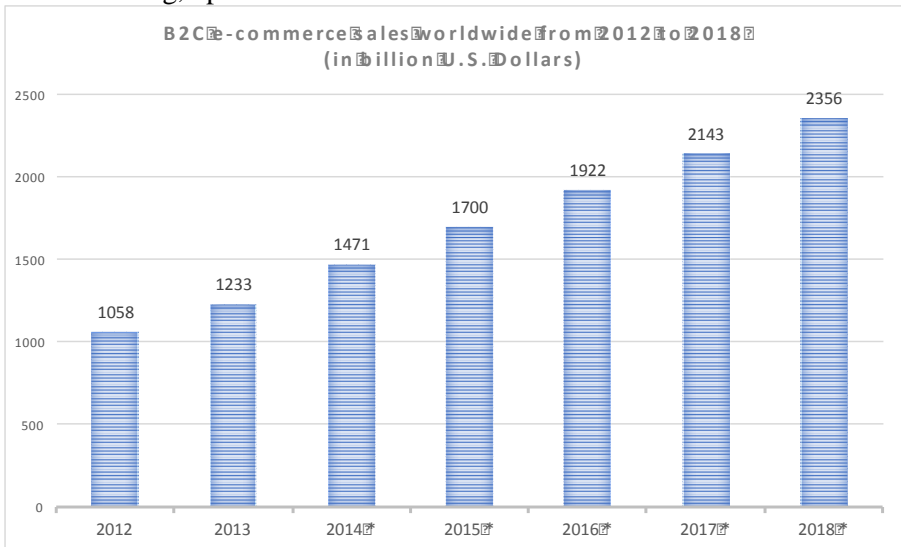
B2C e-commerce sales worldwide from 2012 to 2018 (in billion U.S. Dollars)

Year	Sales
2012	1058
2013	1233
2014 *	1471
2015 *	1700
2016 *	1922
2017 *	2143
2018 *	2356

Figure 2: B2C e-commerce sales worldwide from 2012 to 2018 [10]

Researchers are using term "Big Data" for describing really large amount of data. Big Data usually is defined by 3Vs:

- Volume - Big data requires processing high volumes of low-density. In some organizations, this might be terabytes, for others it may be petabytes.

- Velocity - The fast rate at which data is received and perhaps acted upon.

- Variety - Type of data which is received from different sources. That can be structured (database), semi-structured (text, audio, video) and unstructured (raw data).

In other words, term "Big Data" refers to a large amount of data which is being generated quickly and can be in any digital form. Big Data analytics can give a large set of opportunities like Personalized Offers, having More Organized Data or making Data-Driven Decisions for e-commerce companies.

Big Data analytics requires many servers with huge storage which need to be maintained internally by the firms. That can be expensive for them. Thus, that is the primary reason many IT companies are suggesting Big Data Analyzing services (Google, Amazon, IBM, Oracle, SAS etc. [5]). These services include launching user-configurable servers with appropriate applications (like Hadoop) for Big Data analytics. E-commerce companies can use these services for:

- Clickstream Analysis
- Real-time Analytics
- Log Analysis
- Predictive Analytics etc.

Each of above mentioned analyzing is directly connected to Big Data analytics. For example, Razorfish, which a is digital marketing company [6], needed to analyze clickstreams of each visitor. They used Amazon Elastic MapReduce (EMR) service to be able to deal with such big data. A common issue for this company was customer segmentation which was related to gigantic click stream data sets. Building internal infrastructure to analyze these click stream datasets required more investments (specially for getting appropriate servers). Without the expensive computing resources, there was a risk of losing clients. So, it was urgent to implement customer segmentation algorithms in a way that could be applied and executed independently of the scale of the incoming data and supporting infrastructure. With the help of Amazon EMR Razorfish was able to gain the expected results [7].

Another example is related to Google's BigQuery feature which is a part of Google Cloud Platform [8]. BigQuery is able to scan terabyte in seconds and petabyte in minutes and it gives ability to its customers easily scale their databases from gigabytes to petabytes. Zulily as an e-commerce company [9] uses big data and analytics to help drive business decisions.

This includes using data to connect customers to the most relevant products, giving opportunities to users to obtain and sell products via the site, getting complete visibility into customers' orders, monitoring and managing supply by thousands of vendors, and consolidating data from all marketing channels. Gathering such data and analyzing it would help them to make right decisions in real-time. Also, they from technical point of view they need an application which can be scalable. With the help of Google Cloud Platform's BigQuery service (it was combined with Compute Engine and Cloud Storage) Zulily was able to reach desired result including application scalability. They were able to integrate their applications with Google Cloud Platform in 6 months [8].

Thus, such approach can be used both in newly created and running e-commerce businesses. Above mentioned examples are just smart implementation of Big Data analysis. Thus, it does not matter in which state are the e-commerce companies (new or running), we suggest them to move their e-commerce sites on the top of such services like Google Cloud Platform or Amazon Web Services. These changes will allow them to start using the force of Big Data which will lead them to get more customers, more sales and more revenue.

Conclusion. In era we are living in, information technologies have become a part of our life. There are everywhere and commerce is just one of them. E-commerce sector in the world is growing yearly and the generated data is getting complex and too much to be handled by the firms themselves because of big costs of servers maintaining. And taking into consideration those factors we suggest to run their businesses in cloud. This will help them to be able to deal with things like clickstream or real-time analysis which will give the huge competitive advantages while making managerial decisions.

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THE PECULIARITIES OF THE AGRICULTURAL SECTOR'S DEVELOPMENT IN ARMENIA

In the article the main problems of the agricultural sectors' development in the RA are studied. The priority directions of the RA's state policy in the sphere of the agriculture's regulation and rural areas' development are characterized. The role of the agriculture in the RA's economic development is presented. As well the present conditions of the