"Big Data" Opportunities on the Example of Yandex Mobile Applications

by
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Abstract. With the spread as Big Data philosophy so its analysis tools, opinion leaders in various sectors of the economy and industry have been using a fantastic opportunity of Big Data. Another thing is to build a whole company or even a single marketing strategy for Big Data, leadership requires a lot of courage - apart from very serious analytical costs. However, Big Data - it is not remote and abstract, it is our today, if not yesterday, and we need to develop new revolutionary way.

Never before data stream was not so large and diverse. Using multiple digital channels we obtain vast amounts of digital data. One can argue marketing has become digital in its basis, it becomes classical natural science. The main objective of marketing - to understand where is the happiness of users (clients, customers). And we are in a situation where the user or the buyer often does not understand what it is his happiness.

On the example of Mobile Application of Yandex, we will see, how volatile consumer's behavior, how seller has to respond at the positive or negative changes, and will see importance of control all kinds of sources of information, because traditional market research, usually use unnatural acts, such as surveys, interviews, shopping centers, focus groups. Big Data learn that in fact people say and what they have done or are going to do. Also, in real time data is received on what people are currently busy, and that they were planning. Only Big Data capabilities allow to handle such volumes of unstructured data is constantly arriving at the input of analytical systems.

1. Introduction

> *"You can't manage what you don't measure."* - W. Edwards Deming
> *"Data from large data sets can take the guesswork out of selling. People have always talked about the 'art' of sales. But with Big Data, art is being replaced by scientific analysis."*
> Homayoun Hatami

"Stone Garden", "Philosophical Garden" ... The main attraction of the Japanese city of Kyoto and dozens of interpretations of fact, which put centuries ago a wise monk Soami in fifteen black rough stones with different sizes, scattered along the white sand.

We say "fifteen stones" because this amount indicated in the description for the tourists. In fact, you can simultaneously observe only fourteen. Fifteenth stone you will not see. Obstruct its neighboring rocks. Take a step on the wooden gallery stretching along the sandy edge of the rectangle - from the remaining three sides the garden is bounded by stone monastery walls - and again fourteen stones. Fifteenth - one that is still hiding, now appeared among them, and other stone disappeared. Another step through the gallery, and ingeniously planned chaos appears again in a composition consisting of fifteen of the same stones, one of which - invisible. One of the interpretations of the sense of this incredible of composition, awakening the mind - in order to see all fifteen stones at the same time, you need to change the point of contemplation - Look at the Stone Garden from the top.

The foregoing to some extent illustrates particular philosophy Big Data, its revolt against the entrenched ideas about the value of experience, repetition of waste reception.

As far back as 2001, industry analyst Doug Laney (currently with Gartner) articulated the now mainstream definition of big data as the three Vs: volume, velocity and variety.

Volume. Many factors contribute to the increase in data volume. Transaction-based data stored through the years. Unstructured data streaming in from social media. Increasing amounts of sensor and machine-to-machine data being collected. In the past, excessive data volume was a storage issue. But with decreasing storage costs, other issues emerge, including how to determine relevance within large data volumes and how to use analytics to create value from relevant data.

Velocity. Data is streaming in at unprecedented speed and must be dealt with in a timely manner. RFID tags, sensors and smart metering are driving the need to deal with torrents of data in near-real time. Reacting quickly enough to deal with data velocity is a challenge for most organizations.

Variety. Data today comes in all types of formats. Structured, numeric data in traditional databases. Information created from line-of-business applications. Unstructured text documents, email, video, audio, stock ticker data and financial transactions. Managing, merging and governing different varieties of data is something many organizations still grapple with (META Group, 2001).

At SAS, we consider two additional dimensions when thinking about big data:

Variability. In addition to the increasing velocities and varieties of data, data flows can be highly inconsistent with periodic peaks. Is something trending in social media? Daily, seasonal and event-triggered peak data loads can be challenging to manage. Even more so with unstructured data involved.

Complexity. Today's data comes from multiple sources. And it is still an undertaking to link, match, cleanse and transform data across systems. However, it is necessary to connect and correlate relationships, hierarchies and multiple data linkages or your data can quickly spiral out of control.

The amount of data in our world has been exploding, and analyzing large data sets—so-called big data—will become a key basis of competition, underpinning new waves of productivity growth, innovation, and consumer surplus. Since the Internet's introduction, we've been steadily moving from text-based communications to richer data that include images, videos, and interactive maps as well as associated metadata such as geolocation information and time and date stamps. Twenty years ago, ISDN lines couldn't handle much more than basic graphics, but today's high-speed communication networks enable the transmission of storage-intensive data types.

For instance, smartphone users can take high-quality photographs and videos and upload them directly to social networking sites via Wi-Fi and 3G or 4G cellular networks. We've also been steadily increasing the amount of data captured in bidirectional interactions, both people-to-machine and machine-to-machine, by using telematics and telemetry devices in systems of systems. Of even greater importance are e-health networks that allow for data merging and sharing of high-resolution images in the form of patient x-rays, CT scans, and MRIs between stakeholders.

Advances in data storage and mining technologies make it possible to preserve increasing amounts of data generated directly or indirectly by users and analyze it to yield valuable new insights. For example, companies can study consumer purchasing trends to better target marketing. In addition, near-real-time data from mobile phones could provide detailed characteristics about shoppers that help reveal their complex decision-making processes as they walk through malls (Michael and Clarke, 2013)

Big data can expose people's hidden behavioral patterns and even shed light on their intentions (Abbas, 2011). More precisely, it can bridge the gap between what people want to do and what they actually do as well as how they interact with others and their environment (Pitt, 2012). This information is useful to government agencies as well as private companies to support decision making in areas ranging from law enforcement to social services to homeland security. It's particularly of interest to applied areas of situational awareness and the anticipatory approaches required for near-real-time discovery.

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2. Big data philosophy on the example of Yandex mobile applications.

With the spread as Big Data philosophy so its analysis tools, opinion leaders in various sectors of the economy and industry have been using a fantastic opportunity of Big Data. Another thing is to build a whole company or even a single marketing strategy for Big Data, leadership requires a lot of courage - apart from very serious analytical costs. However, Big Data - it is not remote and abstract, it is our today, if not yesterday, and we need to develop new revolutionary way.

Topic, concerning Big Data in marketing on mobile platforms was discussed at the International Congress WEBIT 2012 and was introduced by Andrew Sebrant, director of marketing services of Yandex.

Never before data stream was not so large and diverse. Using multiple digital channels we obtain vast amounts of digital data. One can argue marketing has become digital in its basis, it becomes classical natural science. The main objective of marketing - to understand where is the happiness of users (clients, customers). And we are in a situation where the user or the buyer often does not understand what it is his happiness.

So why marketing - is an experimental science?

• We are exploring the world (people, products and markets) creating models and testing them in experiments

• The models are based on the known facts, observations, intuition and imagination. Model is not just a formal extrapolation!

• Experiments and tests are conducted with the using standard scientific methods

If we consider the scope of mobile marketing, we are dealing here with

• mobile applications

• sites, adapted or developed for mobile devices

There is something that top managers should keep in mind when they start Big Data strategy in its business niche: real, advanced analytics of big data - it's about what relationship exists between the various sets of digital data received from the various channels.

The first thing that should make leader is to ensure that the disposal of the company have sufficient tools to analyze incoming data. For a large WEB Yandex has enough analytical tools, the main are- Yandex Metrica and Google Analytics. For mobile WEB, there is much less tools and this sector is not so developed. Thus, in the case of mobile WEB, Yandex operate at comparatively (relatively large WEB) a small amount of data with limited tools.

The key to using Big Data capabilities in such cases - to concentrate on getting a set of analysis results having the greatest impact on the achievement of our business objectives and understand what specific data to collect for this set of results.

Let's consider mobile applications. Below on the the example of a real application (*Figure 1.Real situation with mobile applications.*) is demonstrated how defectively thoughtless measurement of indicators, which do not reflect the real picture of the life of the application.

Figure1. Real situation with mobile applications (Source: Yandex statistics)

On the picture we can see, what's the result of using the number of downloads of new mobile applications as a key parameter of marketing statements. On time scan we see, how many users remain loyal to this application after 9 months - 7% of initial value.

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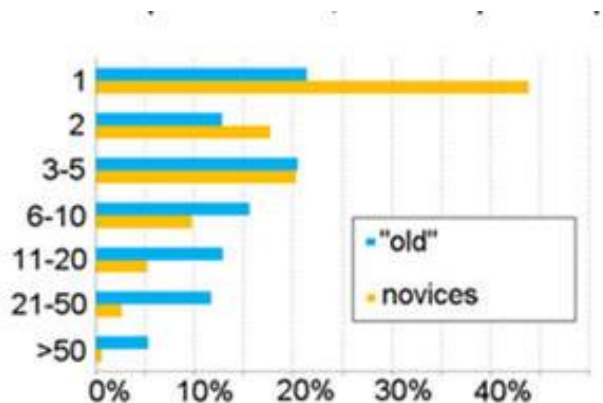Big Data need to be analyze over long time intervals (*Figure 2*)

Figure 2. Information about application at the long time interval (source: Yandex statistics)

As we see, all, who uses the application more than a month, using it often.

First 4-6 weeks of using the application - is a watershed, a reference point for the analysis of data on a mobile application. Further, most interesting - remains people, who will be a long time with your application, if you are going to meet their interests, understanding what is their user happiness in relation with your business.

● carefully and deeply analyze the part of the audience, which remained loyal to the application after 4-6 weeks of use. Operating interests, demographics, location data, anything that can give a characterization of a group of users. These data, we will need throughout the work.

For a business app: Two main reasons to increase life span of an app:

1. To save money spent on promotion and distribution

2. To make money off loyal, seasoned, frequent users.

But to understand, why they stop using, you need to look at the segmentation, build a model, and focus efforts.

However, to understand, why stops the using of applications, we need to use segmentation, to build a model and properly focus our efforts.

Consider the example of segmentation on the Mobile Platforms (Figure 3 and Figure 4)

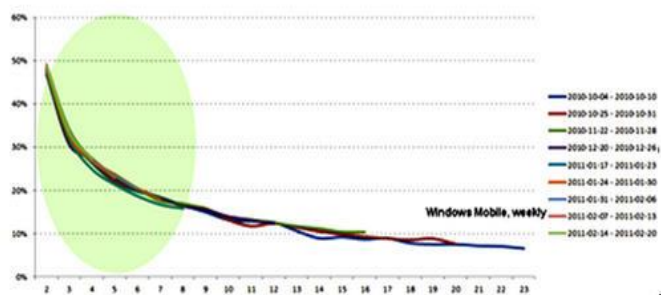As you can see from the graphs, from week to week outflow of users is about the same level.

Figure 3. Windows mobile. Outflow of users. (source: Yandex statistics)

On the Android platform on the same time scale, we see a different picture - from week to week outflow of users becomes smaller:
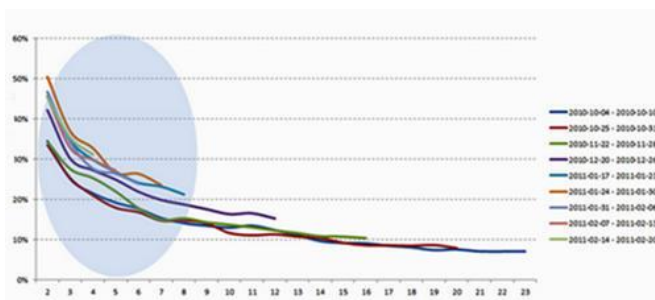

Figure 4: Outflow of users, which use Android (source: Yandex statistics)

Advice:

● Observing data, which demonstrate negative dynamics for your purposes, do not panic!

● Divide the data into segments and look for the hidden positive dynamics

● Work separately with each data segment

"It's hard to make predictions, especially about the future», - Yogi Berra, amateur philosopher.

This is ridiculous term in our day no longer look so funny. Came Era Big Data - and with it the ability to predict the future. It really becomes part of the new business realities.

Whatever your field of activity, doing business today means to immerse in a lot of noisy, unstructured data, which is coming to you in real time from your customers, competitors, from a plurality of channels, connecting you with the environment of your business - and to extract from this mass of data the information,

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which allows to predict the trends of development of your business.

Who works best with big data?
Although many of the roles integral to big data already exist in most organizations, their scope, visibility to executive management, and necessary technical skills could be more sharply defined. People who fill these roles have certain characteristics, such as a willingness to experiment and the ability to "data model" the future.

Procter & Gamble CEO Bob McDonald, for example, is convinced that "data modeling, simulation, and other digital tools are reshaping how we innovate," which has changed the skills his employees need. P&G created what McDonald calls "a baseline digital-skills inventory that's tailored to every level of advancement in the organization." Business intelligence (BI) managers have the skills to provide input into business-unit and corporate strategy, and business analysts know how to take a hypothesis-based approach to problem solving and adopt a cross-departmental view of data to identify opportunities firmwide. Similarly, data analysts work with unstructured data in developing complex statistical models, and data managers redesign IT architecture so that it provides a company-wide view, incorporating larger data manipulations (of unstructured data) and modeling activities into their decision-making process (Harvard Business Review, 2012)

As mentioned earlier, data scientists are a hot commodity because they are proficient in analyzing large datasets to recognize trends, build predictive models, and identify business improvement opportunities. Unlike data managers and data analysts, data scientists usually have advanced degrees (preferably PhDs) in computer science, statistics, applied mathematics, or other relevant fields. And ideally, they have programming skills needed to procedurally manipulate and analyze large data sets. They are good communicators and often have a natural ability to translate business questions into meaningful analysis.

3. Conclusions

Traditional market research usually use unnatural acts, such as surveys, interviews, shopping centers, focus groups. Big Data learn that in fact people say and what they have done or are going to do. Also, in real time data is received on what people are currently busy, and that they were planning. Only Big Data capabilities allow to handle such volumes of unstructured data is constantly arriving at the input of analytical systems.

Internet marketing has become a real fundamental science and results of researches is needed and should be used in business prognostics. For example, the dynamics of the number of queries to the search engine from quarter to quarter gives a clear forecast of the demand for real estate, than a whole team of analysts.

Knowing the exact time and place where and at what point you need to deliver some message (or take action) before that time is meant to have an extraordinary ability.

Use scientific marketing opportunities, and the distance between you and your customers will be so close as never before.

Big Data research can generate ideas that allow to bring business at new quality level. However, «Big Data» differs from just large data sets on the following parameters:
• Sources
  Big Data collect data on multiple, both online and offline channels. This is data about business customers, partners, suppliers, search queries, social media data, location data, using even data such as weather and demographic information of the target audience
• Timeline
Now the data available to us, and in real time. Knowing how to find our potential customers in social networks, we can analyze what they say, for example, in social environments (through behavioral and sentiment analysis) and what they are buying. (Hagen et al, 2013)
Simple examples:
Information, about estimated time of childbirth of pregnant women can help manufacturers of children's products offer women products

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relevant to their interests by the specified date and work to maximize profits for themselves and maximum satisfaction of consumer interest. Dynamics of the number of queries to the search engine from quarter to quarter gives a clear forecast of the demand for real estate, than a whole team of analysts.

Analysis of the dynamics of user requests to the search engine about the symptoms of cold and flu, for example, would allow drug manufacturers to quickly prepare medications increase demand and prevention.

Data is growing at a 40 percent compound annual rate, reaching nearly 45 ZB by 2020
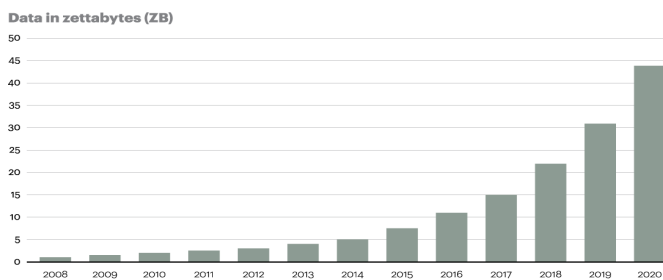
Data in zettabytes (ZB)

Figure 5. Volume of business data (Oracle, 2012)

The world is inundated with data every minute of every day, and it's not slowing down. An estimated 2.5 zettabytes of data were generated in 2012 alone, and trends indicate that the volume of business data will grow significantly every year (Figure 5).

Consider these statistics:

1. Every day, 2.5 quintillion bytes of data are created, with 90 percent of the world's data created in the past two years alone. (IBM, 2012)

2. Data production will be 44 times greater in 2020 than in 2009. (Wikibon Blog, 2012)

3. The volume of business data worldwide is expected to double every 1.2 years. (KnowIT Information Systems, 2012)

4. Wal-Mart processes one million customer transactions per hour, stored in databases estimated to contain more than 2.5 petabytes of data. (SAS, 2011)

5. The enormous data influx is straining IT infrastructures. In a recent survey, 55 percent of executives said data is slowing down their IT systems (Avanade, 2010).

The list can be extended indefinitely, but this is only the beginning of a big game with Big Data. Renowned 20th-century economist Joseph Schumpeter said, "Innovations imply, by virtue of their nature, a big step and a big change ... and hardly any 'ways of doing things' which have been optimal before remain so afterward." Schumpeter's words describe big data's potential creative destruction of today's business models.

6. Poor data management can cost up to 35 percent of a business's operating revenue. (Fathom Digital Marketing, 2012)

Big data promises to be transformative. As computing resources have evolved, advancing to better handle data size and complexity, companies stand to reap many more benefits from big data and analytics.

Little wonder that big data is a hot topic in corporate boardrooms and IT departments, with many leading firms doing more than talking. According to a recent A.T. Kearney IT innovation study, more than 45 percent of companies have implemented a business-intelligence or big data initiative in the past two years.

8. Further studies estimate more than 90 percent of Fortune 500 companies will have at least one big data initiative underway within a year.

Is big data the 21st century equivalent to the Industrial Revolution? Most think so. Companies are increasingly experimenting with and implementing ways to capture big data's potential for both short- and long-term advantage. The crucial success factors are to first think of data as an asset—as the foundation upon which to build propositions and business models—and then to diligently build out the capabilities necessary to capitalize on big data's potential. And perhaps most importantly, embrace the creative destruction of today's business models. (Hagen et al, 2013)

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