St. Petersburg University
Graduate School of Management

Master in Management

BIG DATA ANALYTICS AS A MARKETING TOOL: THE BEST PRACTICES OF RUSSIAN COMPANIES

Master's Thesis by the 2nd year student
Concentration — Management
Ekaterina A. Artiukhova

Research advisor:
Associate Professor
Maria M. Smirnova

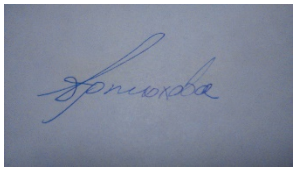
St. Petersburg
2016

ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

Я, Артюхова Екатерина Андреевна, студент второго курса магистратуры направления 38.04.02 «Менеджмент», заявляю, что в моей магистерской диссертации на тему «Большие данные как инструмент маркетинга: лучшие практики российских компаний», представленной в службу обеспечения программ магистратуры для последующей передачи в государственную аттестационную комиссию для публичной защиты, не содержится элементов плагиата.

Все прямые заимствования из печатных и электронных источников, а также из защищенных ранее выпускных квалификационных работ, кандидатских и докторских диссертаций имеют соответствующие ссылки.

Мне известно содержание п. 9.7.1 Правил обучения по основным образовательным программам высшего и среднего профессионального образования в СПбГУ о том, что «ВКР выполняется индивидуально каждым студентом под руководством назначенного ему научного руководителя», и п. 51 Устава федерального государственного бюджетного образовательного учреждения высшего профессионального образования «Санкт-Петербургский государственный университет» о том, что «студент подлежит отчислению из Санкт-Петербургского университета за представление курсовой или выпускной квалификационной работы, выполненной другим лицом (лицами)».


(Подпись студента)

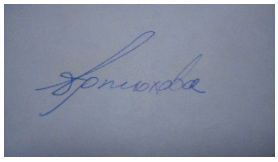
24.05.2016 (Дата)

STATEMENT ABOUT THE INDEPENDENT CHARACTER OF THE MASTER THESIS

I, Ekaterina A. Artiukhova, second year master student, program 38.04.02 «Management», state that my master thesis on the topic «Big data analytics: the best practices of Russian companies», which is presented to the Master Office to be submitted to the Official Defense Committee for the public defense, does not contain any elements of plagiarism.

All direct borrowings from printed and electronic sources, as well as from master theses, PhD and doctorate theses which were defended earlier, have appropriate references.

I am aware that according to paragraph 9.7.1. of Guidelines for instruction in major curriculum programs of higher and secondary professional education at St.Petersburg University «A master thesis must be completed by each of the degree candidates individually under the supervision of his or her advisor», and according to paragraph 51 of Charter of the Federal State Institution of Higher Professional Education Saint-Petersburg State University «a student can be expelled from St.Petersburg University for submitting of the course or graduation qualification work developed by other person (persons)».


(Student’s signature)

24.05.2016 (Date)

АННОТАЦИЯ

Автор	Артюхова Екатерина Андреевна
Название магистерской диссертации	Большие данные как инструмент маркетинга: лучшие практики российских компаний
Факультет	Высшая Школа Менеджмента
Направление подготовки	38.04.02 «Менеджмент»
Год	2016
Научный руководитель	Смирнова Мария Михайловна
Описание цели, задач и основных результатов	На сегодняшний день анализ больших данных является одной из самых перспективных инноваций для бизнеса. Область применения данной технологии в маркетинге чрезвычайно обширна и широко востребована компаниями. Являясь частью мирового делового сообщества, ряд российских компаний начал использовать анализ больших данных для решения вопросов, связанных с маркетингом. Цель данного исследования – определить факторы, оказывающие влияние на практики российских компания в области анализа больших данных как маркетингового инструмента, и разработать для них рекомендации. Эта работа прежде всего принимает во внимание анализ практик российских компаний и особенности российского контекста, который должен быть подробно проанализирован. Ввиду инновационности темы и исследовательского характера работы основной методологией является анализ нескольких кейсов. Для изучения были отобраны и проанализированы практики четырех крупных российских компаний из сфер телекоммуникаций и розничной торговли. В ходе исследования была продемонстрирована высокая зависимость особенностей практик российских компания в анализе больших данных как маркетингового инструмента от внешней среды и общего уровня развития рынка, а также было выявлено влияние таких факторов, как наличие организационных компетенций по управлению большими объемами данных, инструментов для оценки эффективности управления технологией и компетентных человеческих ресурсов. Помимо того, работа содержит рекомендации для менеджеров о том, как наиболее эффективно управлять совокупностью различных инструментов анализа больших данных в сфере маркетинга.
Ключевые слова	Анализ больших данных, маркетинг, инновации в маркетинге, маркетинговые информационные системы, бизнес аналитика, маркетинговая аналитика, управление базами данных, маркетинг в России

ABSTRACT

Master Student's Name	Ekaterina A. Artiukhova
Master Thesis Title	Big data analytics: the best practices of Russian companies
Faculty	Graduate School of Management
Main field of study	38.04.02 «Management»
Year	2016
Academic Advisor's Name	Maria M. Smirnova
Description of the goal, tasks and main results	Big data analysis is considered to be one of today's top business innovations. Marketing applications of technology are truly diverse and highly demanded by companies. Being a part of the global business community, a number of Russian companies also have started to use big data analysis for solving marketing-related problems. The aim of this research is to determine the factors which impact current practices of using big data analytics as a marketing tool by Russian companies and develop recommendations for them. This study is focused on the analysis of practices of Russian companies and peculiarities of the Russian context, which should be thoroughly analyzed and taken into account. Due to the innovativeness of the topic and exploratory nature of research, the main research method applied in this study is multiple case study analysis. Four major Russian companies from telecommunications and retail sectors have been selected and analyzed. The study has demonstrated high dependency of big data marketing execution by Russian companies on the external environment and overall level of big data market development and revealed the importance of such factors as existence of organizational data management competences, performance evaluation metrics and expertise of human resources. Besides, the managerial implications of this paper contain recommendations for Russian companies how to apply effectively a combination of big data marketing tools.
Keywords	Big data analysis, marketing, innovations in marketing, marketing information systems, business analytics, marketing analytics, marketing in Russia, database management

Table of contents

Introduction

Today the global business community has become much more concerned with innovation as a potential growth driver as it was in the past years. Nowadays every company understands that in order to be truly successful and competitive in today's rapidly changing business environment it needs to invest in innovation.

Big data analysis is considered to be one of today's business innovations with the highest potential. It has recently gained extremely high interest by the business community all over the world. Companies are attracted by the variety of managerial implications of big data analysis across all business functions and industries and promising gains of this technology.

According to statistics (Datameer, 2014; Forbes, 2014), from all applications of big data analysis more than 50% of problems addressed belong to customer-related problems which means that marketing applications of technology are highly demanded by companies. Therefore, the problem of big data analysis as a marketing tool is in line with the most recent technology concerns of business.

The topic of this master thesis is "*Big data analytics as a marketing tool: the best practices of Russian companies*". The focus of this research study on marketing is justified by the current market trends and real-life evidence of companies' interest in marketing-related applications of the technology.

Being a part of the global business community, a number of Russian companies also have started to use big data analysis for solving marketing-related problems. This research study is focused on *the analysis of practices of Russian companies* and *peculiarities of the Russian context*, since we believe that they also have great potential to benefit from these opportunities, yet specifics of the local market should be thoroughly analyzed and taken into account.

Due to the innovativeness of the topic, the specifics of using big data for marketing purposes in real-life business environment have not been clearly defined and examined by researchers as well as by business practitioners.

Applications of technology as a marketing instrument are demonstrated in general terms in the publications of Arthur (2013), Feinleib (2014), Weber and Henderson (2014), Bacon (2014), etc. A lot of general information on this issue can also be found in analytical reports and studies (Forbes, 2014,2015; Oracle, 2014; CIO Online Journal, 2014, 2015; Dietrich, Plachy, Norton, 2014).

Neither in foreign publications, nor in Russian ones there is a significant number of thorough and comprehensive research studies conducted on obstacles and barriers of execution big data analysis as a marketing tool which would be based on real-life cases.

Theoretical publications by such authors as Minelli, Chambers, Dhiraj (2013), Arthur (2013), Stewart (2015) as well as publications prepared by practitioners from McKinsey (2011) and IBM (Dietrich, Plachy, Norton, 2014) provide a general overview of potential obstacles connected with big data analysis execution, however they are not examined specifically enough.

However, it is crucial to mention that since foreign companies have started to resort to big data analysis as marketing tool much earlier than Russian companies, theoretical and practical studies of foreign researchers in this field still contain more insights and valuable information than those of Russian authors.

To sum up, *the research goal* of this study is to determine the factors which impact current practices of using big data analysis as a marketing tool by Russian companies and develop recommendations for them.

The research object of this master thesis is the peculiarities of usage and implementation of big data analysis for marketing purposes by Russian companies.

Due to the innovativeness of the topic and current insufficient level of investigation of big data marketing in the Russian context by researchers as well as business practitioners this study is a subject of *exploratory research.*

Taking into account the exploratory nature of the research, the major *research questions*, formulated below, will form a basis for the empirical part of this study, which will therefore consist of *multiple case study analysis*:

1. Why Russian companies resort to big data analytics as a marketing tool?
2. How do Russian companies execute big data technology as a marketıng tool?
3. How do Russian companies overcome barriers connected with big data analysis as a marketing instrument?
4. How can Russian companies leverage the expertise of global market leaders in order to empower big data analytics for marketing purposes in Russian market?

Besides, it is important to mention that insufficient level of implementation and analysis of big data marketing by Russian as well as foreign companies puts limitations on the variety of industries which are investigated in this study. As a result, four Russian companies from two major market sectors, where large amounts of data are being generated, have been selected for analysis - telecommunications and retail.

Concerning the structure of this master thesis, the first chapter is dedicated to *the overview of relevant theoretical publications* on contemporary marketing instruments, big data as a new technology for business, big data applications in marketing, global overview of the market as well analysis of the Russian market and relevant practices of Russian companies in using big data analysis for marketing purposes.

The second chapter of the study introduces in details *the methodology* used for conducting the research. Finally, the third chapter illustrates *empirical findings* of the research

and demonstrates analysis of four case studies of Russian companies, illustrates managerial implications and limitations of the study.

Chapter 1. Literature Review

1.1 Overview of contemporary marketing tools

The first chapter of this study is dedicated to *the thematic review* of existing theoretical literature on global managerial practices of big data analysis. Besides, due to the innovativeness of big data analysis as a technology this review includes analysis of *cross-disciplinary publications* and covers various topics from management and information technology in business to strategic marketing and marketing analytics. A brief overview of the structure of this chapter is demonstrated in the figure below.

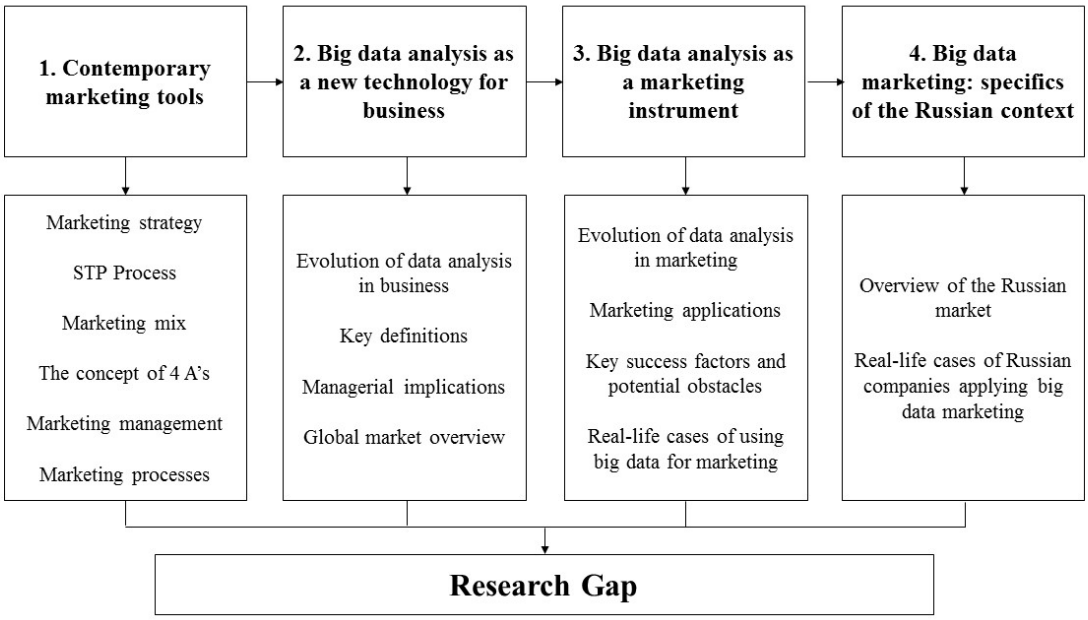


Fig. 1 Structure of the literature review

As it is demonstrated in the figure above, the major objectives of this chapter are to introduce contemporary marketing tools and provide a perspective on big data analysis as one of today's top innovations for business; to demonstrate the variety of managerial applications of big data analysis with a focus on marketing applications of technology and to analyze the global and Russian markets of big data and illustrate existing real-life cases of technology implementation.

1.1.1 Marketing strategy

Diverse opportunities which big data analysis opens up for businesses include resolving of marketing-related issues. The analysis of a wide number of applications of big data as a marketing tool will be addressed in this chapter.

However, it is important to understand that execution of any marketing strategy is based on marketing tools and instruments which marketers use to reach their objectives. Let us

demonstrate an overview of contemporary marketing tools which are commonly used by organizations all over the globe.

Marketing's role in the organization is diverse and it simultaneously encompasses strategic and tactical decisions which are centered on creating value for customers and building strong customer relationships to capture value from customers in return. Let us demonstrate contemporary marketing tools from the point of view of the marketing strategy and refer to "Principles of Marketing" by Kotler, Armstrong, Harris and Piercy (2013).

Marketing strategy is "the way in which the marketing function organizes its activities to achieve a profitable growth in sales at a marketing mix level" (Kotler, 1997).

It is also the process of planning a set of marketing actions which helps companies to create value for customers and build profitable customer relationships. Customer value and relationships form the kernel of every marketing strategy.

1.1.2 The role of the STP process in marketing

In order to understand which customers a company should serve and which segments offer the best opportunities the total market is divided into several groups. The process of dividing a market into distinct groups of buyers who have different characteristics, behaviors and needs and who might require separate marketing programs and separate products is called *segmentation* (Kotler, 1967).

As long as the market segments have been defined, a company can enter one or any of the identified segments. *Market targeting* is the process of evaluation of each market segment's attractiveness and selection one or more most profitable segments to enter.

After making the targeting decisions an organization should decide on how to differentiate its market offerings for each targeted segment and what positions a company plans to occupy in those segments relative to competitors' offerings. Therefore, *positioning* is the process of arranging a clear, distinctive and desirable place for a product in the minds of target customers so that it will give a product the greatest advantage among competitors from the same segment. All three processes, mentioned above, are often referred to as *STP process* which stands for integrated strategy of segmentation, targeting and positioning decisions. It is also worth mentioning that effective positioning starts with *differentiation* - the process of creating differentiating factors of the company's market offering so that it gives customers maximum value.

1.1.3 Marketing mix and 4P's concept

Guided by decisions on the STP process and differentiation, marketers move on to the next level of marketing strategy development and design an *integrated marketing mix* composed of factors under control of the organization and defined as *4P's concept* (Kotler, 1967, McCarthy, 1960, Alderson, 1957). These factors include decisions on product, price, place and promotion. 4P's concept is a set of tactical marketing tools that the company blends to produce the response it wants in the target market. Let us consider which marketing tools belong to every category.

Product is the combination of goods and services that the company offers to the target audience. Marketers have to be concerned with development of variety, quality, design, features, brand name and packaging while designing a product.

As for the *price*, which is the amount of money customers must pay to obtain the product, marketers should develop pricing strategy, discounts, allowances, decide on payment periods and credit terms.

Place stands for building distribution channels, deciding on coverage, locations, managing logistics and inventory, etc.

With regards to *promotion*, which includes all activities which communicate the benefits of the product and persuade target customers to buy it, marketers execute advertising campaigns, personal selling, sales promotion and manage public relations.

Recently the model has been expanded to *6P's concept* since two more categories have been added to this approach: people and performance. *People* stands for all existing and potential customers, their characteristics and purchasing power. Therefore, *performance* stands for overall performance of the business, strategic and financial goals and unique selling propositions.

From the customer's point of view 4P's can be replaced by the model of *4C's* (Lauterborn, 1990): *customer solution* (customers needs and wants) describing the product; *customer cost*, which stands for the price; *convenience*, describing the place; and *communication* which is equal to promotion activities.

1.1.4 The concept of 4 A's

Another noteworthy marketing model was developed by Sheth and Sisodia (2012) under the name of *4A's concept* as an extension to conventional marketing mix concept. The concept represents a set of tools which help marketers to test whether marketing tactics, generated by 4P's model, have reached their objectives. The model, linking tactics with real outcomes, is an approach to see the effects of the company's actions through the values of customers: acceptability, affordability, accessibility and awareness.

Acceptability, which consists of *functional acceptability* and *psychological acceptability*, shows the extent to which the organization's total product offering meets and exceeds customer expectations.

Affordability demonstrates how the current pricing strategy is perceived by customers, It has two dimensions: *economic affordability* (ability to pay) and *psychological affordability* (willingness to pay).

Accessibility, with its two-dimensional nature (*availability* and *convenience*), is concerned with the problem whether customers are able to readily acquire and use the product.

Awareness, which consists of *brand awareness* and *product knowledge*, demonstrates the extent to which customers are informed of product characteristics, persuaded to try it, and, if applicable, reminded to repurchase it.

As long as the tactics for marketing mix are settled and tested with the help of 4A's concept, companies need to pay attention to management of marketing processes.

1.1.5 Marketing management

Marketing management functions are represented by the following processes:

- *Marketing analysis* (analyzing internal and external environment);
- *Marketing planning* (setting strategic marketing goals and objectives);
- *Marketing implementation* (turning marketing strategies into marketing actions to achieve strategic marketing objectives);
- *Marketing control* (measuring and evaluating results of marketing strategies and plans and taking corrective actions).

1.1.6 Marketing processes

After having reviewed all processes which form an organization's marketing strategy, let us examine marketing instruments from the perspective of *marketing processes*. Marketing processes have been defined in different ways, but we have chosen the framework (Webster, 1997) which centers on marketing as defining, developing and delivering value for customers since we believe in customer centricity of marketing and marketing tools.

Value-defining marketing processes:

- Market research;
- Analysis of core competences of the company;
- Strategic positioning of the organization in the value chain;
- Economic analysis of customer use systems.

Value-developing processes:

- New product development;
- Distribution channels building;
- Sourcing strategy development;

- Vendor selection;
- Building of strategic partnerships with service providers;
- Pricing strategy development;
- Value proposition development.

Value-delivering processes:

- Distribution and logistics processes management;
- Advertising and sales promotion;
- Product upgrades and recalls;
- Deployment of the sales force.

To sum up, today marketers have a variety of marketing tools and instruments at their disposal which assist them throughout the whole process of marketing strategy development, execution and controlling of marketing management performance. Some of the tools get replaced or extended by new concepts while others remain to serve as a basis for the marketing processes planning and execution.

However, today in order to succeed in a rapidly changing and highly competitive business environment companies often resort to various innovative tools in marketing, one of the most attractive of which is big data analysis. Not only companies, which extensively use information technology tools in their everyday business environment and generate extremely large amounts of information, but also today's tech-savvy and always-connected consumers altogether create a tremendously large basis of data which is exponentially increasing overtime. No doubt that businesses are willing to take advantage from these diverse datasets.

Marketers can derive a variety of valuable insights out from this information with the help of big data analysis which can be applied in almost every element of a marketing strategy, starting from segmentation to controlling of marketing performance.

In order to address big data applications as a marketing instrument let us move on to the introduction of this technology and detailed analysis of its managerial implications.

1.2 Big data analysis as a new technology for business

1.2.1 Evolution of data analysis in business

The invention of Internet about thirty years ago started a new epoch of advanced information technology which totally changed the way businesses used to operate. During the digitization of business corporations learned how to take advantage from the computing and Internet technologies, however the era of big data was just at its doorstep.

Rapid development of information technology as a marketing tool during the 2000-s was going hand in hand with the growing interest of business in new promising opportunities created by innovative technology. These innovation-driven marketing approaches included

advancements in marketing information systems, customer relationships management, database marketing, but above all big data marketing. By the end of 2000-s the question of application of big data analytics in marketing has found its wide niche in scientific research. Starting approximately from 2010 there has been a major increase in the number of papers dedicated to this problem. From a variety of scientific investigations a few interesting articles, where big data phenomenon is addressed, have drawn our attention.

In order to get a better understanding of what defines big data, let us refer to the authors of "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses" Minelli and Chambers (2013). In their opinion, a number of specific factors and trends triggered the emergence of big data phenomenon back in 2010-es. The most important of them are listed below:

- Tremendous amount of data which has been accumulated within and outside organizations overtime;
- Apart from multiplied volumes of data, increased velocity and variety of data are also noteworthy which altogether makes data more complicated and cumbersome to be processed and analyzed;
- Emergence of mobile and cloud computing;
- Rapid development of social networking;
- Long-term downward tendency for technology prices;
- Economic feasibility and affordability of storing data and conducting real-time analytics;
- Convergence of various technology tools such as analytics software, open-source technologies, traditional data management and hardware technologies as a new way to address complex questions of big data analysis.

In addition, the data systems evolution can be described by three main historical milestones (Minelli, Chambers, 2013):

1. Early stage of data systems development when users did not have a clear vision of what they want to get from the data they had;
2. Recent years of data systems development when businesses learned how to take the advantage of analytical platforms and generate consumer insights out of the data;
3. The era of big data where increased collaboration among companies and convergence of various IT technologies created new promising opportunities for data analysis.

1.2.2 Key definitions of big data analysis

After we have introduced the evolution of data analysis in business and made an overview of how big data epoch emerged in the market let us define key terms on big data analysis which are most relevant and useful for business users.

Big data: To begin with, the definition of big data varies greatly from publication to publication. The literature review has demonstrated that "big data" term is used when referring to a variety of different entities including social phenomenon, information assets, data sets, analytical techniques, storage technologies, processes and infrastructures. In order to clarify the most crucial definition of this research paper let us refer to several relevant sources.

A lot of definitions focus on *characteristics* of the data. To sum them all up, big data is defined by the data which goes beyond traditional limits in three major dimensions: volume, variety and velocity. For example, Laney (2001) introduces a framework expressing the 3-dimensional increase in data volume, velocity and variety and invokes the need for new formal practices that will imply "tradeoffs and architectural solutions that involve/impact application portfolios and business strategy decisions". Although this work did not mention big data specifically, the model, later nicknamed as "the 3 V's", was associated to the concept of big data and used as its definition. Many other authors extended the "3 V's" model and, as a result, multiple features of big data such as value (Dijcks, 2012) veracity (Schroeck, Shockley, Smart, Romero-Morales, Tufano,2012), complexity and unstructuredness (Intel,2012), were added to the list.

A second group of definitions emphasizes the *technological needs* behind the processing of large amounts of data. According to Microsoft, big data analysis is focused on applying "serious computing power" to massive sets of information (Microsoft, 2013) and also the National Institute of Standards and Technology (NIST) emphasizes the need for a "scalable architecture for efficient storage, manipulation, and analysis" when defining big data (NIST, 2014).

There are several definitions of big data which are dedicated to the crossing of some sort o f *threshold*: for instance, Dumbill (2013) believes that data is big when it "exceeds the processing capacity of conventional database systems" and requires the choice of "an alternative way to process it". According to Frampton (2015), "the term "big data" refers to data sets so large and complex that traditional tools, like relational databases, are unable to process them in an acceptable time frame or within a reasonable cost range. Problems occur in sourcing, moving, searching, storing, and analyzing the data, but with the right tools these problems can be overcome".

As we have discovered, there are three major dimensions which help researchers to quantify big data:

Volume, which is measured by the quantity of variables, transactions, attributes, events, etc. In the past researchers used to work mostly with samples, smaller data sets, and created predictive models. However, big data does not assume any volume constraints which allows

researchers to analyze much larger data sets and identify a number of previously invisible trends and patterns.

Variety, which represents the assortment of data and is closely connected with the definitions of *structured* and *unstructured* data. Structured data used to dominate the amount of data being processed by enterprises and is much easier to analyze as it is classified on the basis of the data type (numeric, character, etc.). However, over the past decades unstructured data has become the prevailing type of data for business analysts to work with. As companies started to look beyond organizational borders and expanded traditional operational data analysis, which most often comes in a form of structured data, they encountered a lot of unstructured, more complex data. Unstructured data by definition does not fit existing databases and is usually text heavy, yet can contain numbers and dates as well.

According to the findings (McKinsey Global Institute, 2011), the amount of data is doubling every two years and 95% of this data is unstructured. Therefore, one of the biggest future obstacles for big data analytics is how to master analysis of tons of unstructured data and apply meaningful results in practice when it will become a commonplace and mainstream.

In some theoretical publications researchers refer to the definition of *semi-structured* data which contains parts of structured and unstructured data at the same time. For example, audio, video, geospatial, click streams, log files and even text data fall into this category. When this data is divided into several elements it turns from unstructured to more structured and, therefore, become easier for an analyst to work with. Semi-structured data has separable semantic elements which allow hierarchies within the data to be constructed.

Velocity of data defines the speed and frequency of data creation, accumulation, processing, etc. The pace of today's business world requires businesses to be able to do real-time analytics and make appropriate decisions in real time. Here is where big data opportunities have a lot to offer.

Data science: Cross-disciplinary field of science main purpose of which is to extract new knowledge and insights from data, both structured and unstructured, by using various statistical, analytical and data mining tools and with minimum of human interaction.

Data mining: Data mining is a process of sorting data and identifying relationships, discovering patterns and trends from data by the means of machine learning.

Machine learning: An algorithm-based artificial intelligence tool which allows computers to process and analyses empirical data, learn from it, use this data for making predictions and adapt to new data exposed.

Business intelligence: Business intelligence represents a set of systems and various tools which collect, store, analyze and access internally generated data and assist organizations in decision-making.

Hadoop: Hadoop technology is an open source software framework made up of a freely available software library that includes the following modules: Hadoop Common, Hadoop YARN, the Hadoop Distributed File System and Hadoop MapReduce. This library allows users to analyze large datasets with the capability of scaling up to thousands of machines. This technology was inspired by Google's products such as MapReduce and Google File System, originally developed by Yahoo! And currently is run by Apache Software Foundation.

MapReduce: Google's software framework for processing huge datasets to analyze a wide range of problems on a distributed system.

Descriptive analytics: Part of statistics which is primarily concerned with description of past and current events on the basis of accumulated data.

Inquisitive analytics: Part of analytics main purpose of which is to describe in details underlying reasons for occurred facts by the means of disposable data.

Predictive analytics: This type of analytics is concerned with future forecasts and predictions about certain trends with a certain likelihood.

This type of analytics works hand in hand with both types of analytics, described above. The insightful information from descriptive statistics on past events is combined with predictions and forecasts regarding the future and altogether analysis of this data gives prescriptions how to obtain a certain goal and achieve certain results.

As a result, big data analysis consists of a blend of cross-disciplinary approaches where various methods of descriptive, predictive and prescriptive analytics are combined in different portions. At the exploratory stage big data analytics resort to descriptive analytics in order to get a deeper understanding of the past events, however there is a trend to move towards predictive and prescriptive analytics at later stages.

Combination of multiple analytical models, real-time predictive analytics, development of advanced applications of predictive analytics are among important shifts describing today's big data analytics challenges. A comprehensive overview of big data analytics introduced by Minelli and Chambers in their publication is demonstrated in a figure below.

Table 1 Overview of big data analytics

	Relevant field of analytics		
	Descriptive Analytics (Business Intelligence)	**Predictive Analytics**	**Prescriptive analytics**
Issues addressed	What is the problem about? How did it happen? How often does it happen? What are the consequences?	What will happen if the trend continues? What is most likely to happen next? How will variable X affect the future?	How do we get there? What is the best solution with a given uncertainty? What are the best choices?
Name of the relevant analytics discipline	Statistics	Data mining; Machine learning; Forecasting; Predictive Modeling; Simulation	Constraint-based optimization; Multiobjective optimization; Global optimization
	Information management		

Source: Minelli, M., Chambers, M. and Dhiraj, A. (2013). Big Data Technology, in Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses, John Wiley & Sons, Inc.- p. 93.

1.2.3 Managerial implications of big data analysis

In the publications reviewed there is a lot of information concerning potential gains and managerial applications of big data analysis. For example, Columbus (2014) believes that "56% of enterprises will increase their investment in big data over the next three years". The author presents persuasive evidences and examples from the real business: "70% of IT decision-makers consider their organization's ability to exploit value from big data as critical to their future success; 65% say they risk becoming irrelevant and/or uncompetitive if they do not embrace big data; 64% are seeing big data changing traditional business boundaries, enabling non-traditional providers to move into their industries; 53% are seeing increased competition from data enabled start-ups; 64% of senior executives said that big data is changing traditional business boundaries and enabling non-traditional providers to move into their industry. Companies report a significant level of disruption from new competitors moving into their industry from adjacent industries (27%), and over half (53%) expect to face increased competition from startups enabled by data".

According to the Forbes' recent survey (Columbus, 2014) of a big number of companies on big data analytics, 89% of business leaders believe big data technologies will disrupt business

world in the same way the Internet did. More than 79% of respondents agree that businesses who will not embrace these opportunities will lose their competitive position and may even extinct. 83% of companies have already pursued big data projects in order to seize a competitive edge. The top three areas with the highest impact of big data in their business operations include: impacting customer relationships (37%); redefining product development (26%); and changing the way operations is organized (15%).

The impact of big data on business is extremely diverse and include solutions for various problems in such areas as supply chain and human resources management, healthcare businesses, banking, insurance, FMCG, retail and many more areas. The variety of solutions which big data can handle can be roughly divided into four main groups and be related to customer-based problems, optimization and modeling, prevention of thefts, fraud detection and complex cross-industrial problems.

There is a big number of examples where advanced data analytics can transform key organizational business processes. Some of them are illustrated below. However, opportunities of technology application for marketing purposes are particularly diverse and attractive as they enable companies to solve a wide number of marketing-based problems:

- **Procurement:** Identification of the most cost-effective suppliers in terms of delivering products on-time and without damages;
- **Product development:** Generation of product usage insights to speed product development processes and improve new product launch effectiveness;
- **Manufacturing:** Identification of quality problems and optimization of manufacturing processes;
- **Distribution:** Quantification of optimal inventory levels and optimization of supply chain activities, e.g. based on external factors such as weather, holidays, and economic conditions;
- **Marketing:** Evaluation of cost-effectiveness of marketing promotions and campaigns in driving customer traffic, engagement, and sales and optimization of marketing mixes given marketing goals, customer behaviors, and channel behaviors;
- **Pricing and yield management:** Optimization of pricing strategies and deep data-driven analysis of various affecting factors;
- **Merchandising:** Optimization of merchandise markdown based on current buying patterns, inventory levels, and product interest insights obtained from social media;
- **Sales:** Optimization of sales resource assignments, product mix, commissions modeling, and account assignments;
- **Store operations:** Optimization of inventory levels given predicted buying patterns coupled with local demographic, weather, and events data;

- **Human resources:** Identification of the characteristics and behaviors of the most successful and effective employees.

As for the organizational function where big data analytics are applied most frequently, a substantial part of results of the analytics are used by marketing, IT, sales and R&D departments and for solving customer-related problems (54%) and operational issues (22%) where big data technologies have a lot to offer.

Fig. 2 Managerial implications of big data analytics. Source: Big Data: A Competitive Weapon for the Enterprise. (2014) Datameer. From: http://www.datameer.com.

To sum up, opportunities and potential gains of big data analysis for business are well illustrated in today's theoretical literature (Minelli, Chambers, Dhiraj, 2013; Davis, 2014; Feinleib, 2014) as well as in publications prepared by practitioners (McKinsey Global Institute, 2011; Columbus, 2014, 2015; Nayler, 2014), yet they mostly represent positive attitude towards technology implementation and therefore reflect current interest in big data analysis.

1.2.4 Global market overview of big data analysis

After having analyzed variety of applications of big data analysis across all business processes, let us proceed with the global market overview of big data and identify major market trends.

From the product & service perspective big data market is represented by three major product & service categories: software, hardware and services. According to statistics, big data services account for the largest share of the market equal to 40%, hardware – 38% while software products' market share remains around 22%.[1] It is also noteworthy that majority of big data providers base their solutions on software with Hadoop technology, which was developed

1 Big Data vendor revenue and market forecast 2013-2017. From: http://wikibon.org/wiki/v/Big_Data_Vendor_Revenue_and_Market_Forecast_2013-2017

by the non-profit Apache Software Foundation, and offer customers a wide range of different big data distributions based on this framework.

Global market of big data is expected to grow from 27 billion dollars in 2015 up to 100-110 billion dollars by 2020. As it has been previously mentioned, the majority of big data market players sell their services which are based on Hadoop technology distribution. According to the research, three top players of the market of Hadoop software distribution are the following: Cloudera accounts for 56 million dollars for annual total revenue in 2012, MapReduce – 23 million dollars while the annual revenue of Hortonworks was equal to 18 million dollars.[2]

At the same time the so-called "Hadoop-as a service market" is anticipated to reach 50,2 billion dollars by 2020 while in 2015 this market counted for only approximately 6 billion dollars.[3] However, according to the research made by Allied Market Research company prospects for Hadoop-as-a-service market are less optimistic. The market is expected to reach only 16,1 billion dollars in 2020 which nevertheless demonstrates extremely rapid growth rates for this market segment.[4]

From the industry perspective, top 5 industries which are the biggest adopters of big data technology are the following (Datameer, 2014): financial services account for 22%, tech companies – 16%, telecommunications' sector use big data account for 14%, retail – 9% and healthcare – 7%

The market of big data analytics has already passed the stage of early development and currently both market entrants and incumbent market players face tough competition. IBM, Google, Microsoft, SAS, SAP, Amazon and Oracle are among key players in big data analytics. However, smaller players such as Cloudera, Pivotal, Palantir and some others also fight for the market share. The detailed overview of functionalities of global big data platforms is demonstrated in a table below.

Table 2 Global big data platforms

	Company	Big data distribution	Additional solutions
Large	IBM	IBM Biginsight (based on	IBM Biginsight

2 Networkworld. Comparing the top Hadoop distributions. From: http://www.networkworld.com/article/2369327/software/comparing-the-top-hadoop-distributions.html

3 Hortonworks. Powering the future of data. From: http://Hortonworks.com

4 Allied Market Research. From: http://alliedmarketresearch.com

market players		Hadoop)	
	Google	Google Cloud Dataflow	Google Compute Engine, Google Cloud Storage, Google BigQuery
	Microsoft	HDInsight (via Hortonworks' Hadoop framework)	SQL programming and Microsoft Excel integration
	Oracle	Hadoop via Cloudera	R statistical programming
	Hewlett Packard	HAVEn (based on Hadoop)	HAVEn Predictive analytics, R statistical programming
	Amazon	Amazon Elastic Cloud Compute; Amazon Elastic MapReduce	Amazon Kinesis, Cloudera Impala, Splunk Hunk, etc.
Small market players	Cloudera	Cloudera CDH (based on Hadoop)	Cloudera Impala analytics
	Palantir	Palantir Gotham and Palantir Metropolis	In-house analytics and data management through Phoenix, Raptor, Horizon and RevDB
	Pivotal	Pivotal HD (based on Hadoop)	Pivotal Analytics and the use of the data-lake concept

Source: Big Data: a road map for business intelligence, Marketline.2015. Pp. 8-13.

Both major groups of market players, pure-play big data providers and large IT-vendors, have started to focus on enterprise buyers, better articulate a wide range of applications of big data in an organization and adapt their products to satisfy specifically this customer group. Besides, partnerships also play a significant role in maturing of the market. In order to make it easier for practitioners to adopt and integrate big data technologies there has been established a number of reseller agreements and technical partnerships between big data providers and non-big data vendors.

Main big data market drivers are listed below:

- Data which has been collected and stored will continue to grow exponentially;
- Multi-formatted and unstructured nature of data which businesses need to derive insights from;
- Traditional IT solutions of business intelligence are failing under new requirements of today's rapidly changing business world;
- Cost of data systems, as a percentage of IT spend, will continue to grow while overall cost of technology will gradually decrease overtime and become more affordable for enterprises.

1.3 Big data analysis as a marketing instrument

1.3.1 Past & present of data analysis in marketing

Traditionally in order to analyze data marketers used to work with operational sources of data and such internally-focused systems as enterprise resource planning (ERP) and customer relationship management (CRM). However, recently the variety and complexity of data sources have significantly increased and provided marketers with new challenges and promising opportunities. The brief classification of various data sources which are at hand of any modern business analyst is demonstrated below:

Conventional data sources:

- Primary data (observations, customer surveys, experiments, interviews, ethnographic research, etc.);
- Secondary data (statistical and industry reports, consumer and business data, marketplace analytics, webnography, scientific publications, etc.);
- Supply chain data (electronic data interchange, vendor catalogues, pricing documents, quality requirements, etc.).

Recently emerged data sources:

- Internet data (social media, clickstreams, etc.);
- Location data (geospatial data, data from mobile devices, etc,);
- Image data (videos, photographs, surveillance, satellite images, etc.)

Device data (sensors, radio frequency identification devices, programmable logic controllers, telemetry, etc.).

Marketers are now doing a variety of things on the Internet starting from online advertising, sharing information about the products, tracking consumer digital behavior to executing online payments. Rapid technology developments have completely changed the environment where marketers used to operate in, set and achieve goals and analyze results of conducted marketing campaigns. So changed the customers, who raised immensely their expectations from companies, have become extremely tech-savvy and always-connected, and who now are favoring simplified visualization of the information they get. Internet technologies have made it much more complex for businesses to attract and engage customers and build long-lasting relationships with products and brands.

In the past data analysis was in the hands of third-party IT organizations which were running expensive and difficult-to-implement ERP systems and creating and managing marketing campaigns, tracking leads, billing customers and solving a number of other marketing-related issues. Nowadays cloud technologies allow companies to fulfill all these activities via the Software as a Service mode over the Web. Emerging enterprise marketing management systems make it possible for businesses to analyze data and collaborate across business functions and as a result improve customer experience.

Marketers have been exposed to a vast amount of data and today both industry giants of B2C sector and small tech startups can have the same immense amount of data about their customers. But at the same time big data promises require marketers to be very tech-savvy and analytical, able to analyze complex models which can provide meaningful results in the real time.

The attractiveness of big data as a powerful marketing tool is so immense because of its capability of finding answers to a very broad range of questions: consumer behavior, buying patterns, churn rates, attitude to competitors' products, acceptance of a new technology and many more marketing-related problems.

All in all, conventional marketing instruments have not become extinct, they have transformed into more data-driven and technologically intensive tools instead which allow companies to develop more focused campaigns and increase the effectiveness of marketing actions.

1.3.2 Marketing applications of big data analysis

After we have demonstrated a variety of opportunities which big data analysis is opening up for businesses, let us concentrate on marketing applications of the technology. Big data opportunities for marketing are so vast and immense that companies simply cannot neglect a chance to resolve a number of marketing-related issues with the help of this technology.

Researchers have defined the term of *big data marketing*. For example, according to Arthur (Big data marketing: Engage your customers more effectively and drive value, John Wiley & Sons, 2013), "big data marketing is the process of collecting, analyzing, and executing on the insights you've derived from big data to encourage customer engagement, improve marketing results, and measure internal accountability".

Research shows that 48% of results of big data analytics are used for solving customer-related problems, which includes churn reduction, product improvement initiatives, increase of customer acquisition and revenue per customer and some more things, and 10% of them are used for new product and service innovation solutions which contain data-driven development of new products and service offerings (Datameer, 2014).

From the perspective of *maturity of an analytical tool*, all marketing applications of big data can be roughly divided into two major groups:

- *Mature analytic applications* include traditionally optimization of marketing campaigns, customer loyalty management, in-store custom analytics and many more things;

- Ad targeting optimization, customer churn prevention, product market targeting, product design and experiments design optimization, advanced brand management are among *maturing* and *emerging analytical applications*.

From the perspective of the *data unit to be analyzed*, big data marketing solutions can be clustered into two large categories:

- *Transactional analytics*: This type of analytics is performance-based and allows business leaders to evaluate all sorts of marketing actions at a higher speed and greater efficiency. For example, one can assess the effectiveness of a particular offer or an ad online.
- *Behavioral analytics:* Behavioral analytics provides insights into the decision processes of individual people making purchasing decisions and can be also defined as *customer analytics.*

Generally speaking, the major share of applications of big data analysis in marketing belong to the category of *customer analytics*. Customer analytics address a wide number of marketing-related problems, e.g. they help companies to enhance customer-centricity of marketing strategy, significantly improve customization of offerings and solve many more issues which will be discussed later on. Customer analytics process, analyze and derive meaningful results from all types of data such as demographic, behavioral and preference data, time-series data and, of course, quantitative and qualitative data.

To begin with, big data allows companies to develop a *personalized 360-degree view of its customers* (Feinleib,2014) and therefore get the comprehensive picture of all customers' profiles with different socio-demographic and behavioral characteristics, preferences, purchase frequencies, buying habits and many more characteristics separately. Today truly data-driven companies are able to execute tailored marketing campaigns across different channels and obtain customers' attention using a customized and integrated set of marketing tools.

Effectiveness of conventional *segmentation methods* based on socio-demographic, psychographic and behavioral characteristics today can be significantly enhanced by big data solutions transforming traditional approaches into more focused and personalized ones.

Kash and Calhoun (2010) give an explicit example of how segmentation has evolved over time using the case of dog food industry: "Working with demographic data, we have traditionally segmented the dog food industry into categories like "owners of medium-sized dogs," "owners of large dogs," or "owners of small dogs." Today, we can view the industry in terms of what actually influences customer behavior: the types of relationships owners seek with their dogs (the why). This leads us to market segments with personas, or representative archetypes, such as "Pampering Parents," "Performance Fuelists," and "Minimalists." This additional dimension is critical; it allows us to more clearly identify each segment's needs and desires, the triggers that

prompt them to act, and the owners' criteria for making purchase decisions. This proprietary insight is a very real source of competitive advantage in a time when customer-centricity matters."

Advanced analytics of the customer data allow businesses to reveal various segments, for example, companies now can *identify opinion leaders* and, as a result, construct more customized offerings for this particularly important customer segment.

Big data also enhances the power of *targeting* generating and using more precise knowledge of prospects and customers, including their preferred communication channels, and allowing marketers to customize key elements of content experience efforts. Having huge amount of situational data at disposal companies can further refine customer experiences to reflect where people are, what they are doing, the devices they are using, the time of day, and even the weather.

Let us refer to Weber and Henderson (2014) to demonstrate how combination of customer data with advanced analytics creates even more powerful targeting opportunities: "Next-best offer analytics help us estimate the probability that a customer will be interested in a targeted offer. When the rules and algorithms of NBO are combined with search engines, we can create cross-selling experiences such as, "You may also like…," which often result in higher average order sizes and happy customers. For instance, the fashion retailer Forever 21 posts personalized recommendations for items on the bottom of their "reset your password" page, knowing that they have your attention and some degree of purchase-intent".

Segmentation focuses marketers' efforts and enables them to better prioritize customers at the segment level, however companies can go one level deeper by using predictive big data analytics to score each of our customers in terms of their own *customer lifetime value* (Arthur, 2013). Big data technology enables companies *to prioritize its customers* according to their purchasing power and target the most profitable ones. Customer lifetime value demonstrates the best estimate of a customer's financial value to the company overtime and has roots in the past purchase behavior of an individual. Therefore, big data enables to prioritize customers, select and target the most potentially profitable customers.

Data fusion is another marketing tool which big data handles very successfully. Data fusion is a common approach in marketing which is used for making inferences about particular segments' behavior and media exposure. During data fusion big data analytics, integrating multiple datasets of similar, but still different respondents or customers, can build an enhanced view of the target group. It is an especially useful tool when there are common underlying characteristics between several respondent groups and there is a need to understand which common factors influence their behavior and how.

As an addition to the various applications of customer analytics, it is important to mention transactional analytics once again and emphasize that big data enables companies to *evaluate performance, measure* and *optimize marketing efforts* (Dietrich., Plachy, Norton, 2014). Thanks to the advanced technology, marketers can enhance effectiveness of the offline and online marketing actions (e.g. increase efficiency of digital marketing strategy or improve social media and content marketing campaigns).

With regards to the specific metrics to measure results of big-data-driven marketing actions, today the most advanced marketers will put the big data analytics power to work, removing more unmeasurable components from their marketing efforts and continuing to make their marketing decisions more data-driven, while others continue to rely on traditional metrics such as brand awareness or no measurement at all. On the other hand, a lot of conventional marketing metrics, especially from web analytics, remain effective and still help companies to achieve goals.

1.3.3 Key success factors and challenges in using big data as a marketing tool

The literature review had demonstrated a number of publications which are supposed to guide companies along the way of implementation of big data analysis and avoid falling into traps. Not only the authors of theoretical research studies, but also a lot of practitioners, experts of building innovation in IT and well-known global consultancies often give their recommendations with regards to business execution of big data marketing. Let us summarize and introduce the most insightful advices which have been reviewed.

From the variety of contemporary marketing instruments, illustrated previously in this chapter, these recommendations give an interesting perspective on development of a marketing strategy and marketing mix as one of its core elements, complexity of using big data for segmentation purposes and specifics of data-driven marketing management.

First of all, there is an opinion (Arthur, 2013) that if a company wants to build successful data-driven marketing it should invest in development of *enterprise data strategy*. To reveal the value of big data, it needs to be associated with enterprise application data. Therefore, companies should establish new capabilities and leverage their prior investments in comprehensive development of infrastructure, platform, business intelligence and data warehouses. Investing in integration capabilities will enable data-driven marketers to correlate different types and sources of data, to make associations, and to make meaningful discoveries faster than competitors with no data strategy at their organizations.

For analytics to become a competitive advantage, organizations need to make "analytics" the way they do business; analytics needs to be a part of the corporate culture and day-to-day operational function of front-end staff.

With regards to the data-driven marketing management, it is recommended *not to expect quick financial returns* from implementation of big data analysis and keep patience in waiting for ROI's. Big data insights may take time to emerge, and the process is continually evolving.

Besides, at the early stage of big data implementation companies should *focus resources* around proving value from big data in one business area first via a pilot program rather than attempting to do everything with big data at once.[5]

Finally, businesses should focus on *building talents for big data analysis*. With talent still one of the biggest big data challenges, organizations need to build the big data skills of existing employees through training and development. This issue will be discussed more in details further on in this chapter.

Being more specific and switching from corporate level to the perspective of a Marketing department of an organization, it is recommended to develop *multidimensional big data marketing strategy* and always analyze data from a number of different sources (Arthur, 2013). The key idea here is two use big data analytics for *effective investment management of the customer portfolio*. Companies should resort to *personalization capabilities of big data analysis* and pay special attention to *diversification of marketing tactics* on the basis of potential profitability levels of different customers.

Besides, big data marketing should be *interactive* and never focused solely on internal data analysis. Businesses should keep in mind that today's advanced analytical tools enable organizations to run experiments, test marketing actions and implement corrections in real-time. To develop a customer interaction strategy companies need to map and understand the buyer journey, from first contact all the way through purchase and aftermarket relationships. As a next step it is necessary to map out the changes that need to occur across organizations, systems, and data to transform and deliver on the customer engagement plan.

The publications, which have been mentioned earlier in this subchapter, mainly represent the positive attitude of scientists and industry experts towards the big data analysis in marketing. However, behind the big data phenomenon in real-life business companies face a number of challenges, starting from technical issues to human resources and legislation problems.

For example, let us refer to Stewart's publication "Big data's big mistake" (2015). The article offers the author's insight to the big mistake being made by marketers, electronic

5 C-level executives seeing big results from big data. (2014). From: http://www.cio.com/article/2607333/big-data/c-level-executives-seeing-big-results-from-big-data.html

commerce leaders and product managers about big data: “Real customer insights are necessary to turn quantitative data into qualitative information. Use qualitative insights to direct the questions of any quantitative study, and use qualitative data to help answer the “why” behind the numbers…You need insight into what customers really want. And to obtain this, you need qualitative data”.

He mentions that the power of qualitative data is often overlooked as marketers increasingly focused on numbers, increasing the risk for companies to treat their customers like numbers. In his opinion, today marketers all over the globe focus so much on numbers that they are neglecting the human side of data. In order to avoid possible misleading outcomes of the data analysis the author suggests the following: ”Use qualitative insights to direct the questions of any quantitative study, and use qualitative data to help answer the “why” behind the numbers”.

Let us mention another worthy critical study on big data analytics by Krajicek (2013). He mentions that business researchers must be insight researchers, they need to be closer to the business rather than to any analytic techniques. The author claims that “it takes a collective effort, of marketers and researchers together, to build the impactful dashboards and architecture that provide relevant insights that drive business change”. Besides, Krajicek emphasizes the complexity of big data processing by ordinary market researchers and adds that successful analysis of big data needs “big thinkers” who understand the market and can survive the chaotic environment of big data and derive insightful solutions.

To sum up, research demonstrates that in order to realize full value of opportunities offered by big data analytics marketers have to overcome the following obstacles:

Technology-related barriers:

- Difficulty of transforming data into a suitable form for analysis;
- Data which comes from multiple and disparate sources is difficult to be merged and integrated;
- There is a shortage of best practices for integrating big data analytics into existing business processes;
- There is a lack of competent big data practitioners and data scientists;
- Difficulty of providing excellence in big data applications performance for a big number of concurrent users.

Non-technology-related barriers:

- Insights generated by big data analysis are often difficult to be operationalized and implemented in business routine;
- Big data market is developing fast and is expected to mature in the nearest future, yet it still remains highly competitive and volatile;

- Stakeholders are not willing to agree on data definitions of big data projects and deployments;
- Despite overall enthusiasm and interest shared by business community, there is still a large amount of end-users who are not fully aware and certain about the real value of big data applications;
- Legal concerns connected with overall regulative framework, privacy and compliance issues will remain as a big challenge;
- There is a lack of ready-to-implement big data applications designed to address specific business problems.

After we have defined all major obstacles for big data implementation in marketing, let us pay special attention towards *the lack of competent human resources* to analyze big data. According to all major publications on the future of big data analysis businesses are very likely to encounter a great shortage of experts in data analysis in the upcoming years (Minelli, Chambers, Dhiraj, 2013). Big data analytics require specialists with deep expertise in machine learning and advanced statistics, yet at the moment demand on this type of analysts exceeds the total amount of data scientists and the trend will continue in the future.

Since big data analysis is the intersection of several scientific fields, data scientists need to be talented at a number of disciplines at the same time: mathematics, information technology, business administration and behavioral sciences. While the first three requirements are quite obvious, knowledge of behavioral sciences is recommended to have a better understanding of human behavior and interrelations between facts and people's actions. Moreover, the education of such experts is rather time-consuming and does not correspond to the real-time needs of business.

According to some research by McKinsey (McKinsey Global Institute, 2011) only in United States around 140 000 – 190 000 data scientists' positions will stay vacant by 2018. A need for big data analysts and managers with necessary expertise in US has been calculated at the total amount of 1,5 million people.

Since big data analysis is the intersection of several scientific fields, data scientists need to be talented at a number of disciplines at the same time: mathematics, information technology, business administration and behavioral sciences. While the first three requirements are quite obvious, knowledge of behavioral sciences is recommended to have a better understanding of human behavior and interrelations between facts and people's actions.

Let us also draw special attention to the fact that businesses suffer a shortage on not just data scientists, but also marketers with deep IT and math expertise. Even when unsorted loads of data will be received by a manager in a more understandable fashion, it is still a great challenge

how to take the advantage of this information, identify and classify numerous trends and patterns.

According to the experts' opinion from IBM (Dietrich. , Plachy, Norton, 2014) this challenge is likely to be quite complicated to get over: "Despite the positive trend in spending for marketing, this will not be an easy shift, either inside or outside IBM...Marketing's creative nature has historically lent itself to a strong belief in decisions based on "gut instinct." Insights from big data and analytics provide a different starting point for decisions and can support the creative process to improve outcomes. Such a transition requires a shift in the skills of the marketing organization.

The predictions are that approximately half of the new hires in marketing teams are expected to come from technical backgrounds, and that is expected to grow in subsequent years as organizations realize that the skills needed in this era of marketing are shifting. A 2013 C-suite study by IBM's Institute for Business Value found that CMOs feel less prepared to cope with big data in 2013 than they did in 2011. For example, in 2011, 71% of CMOs felt underprepared for the data explosion; in 2013, 82% did".

1.3.4 Real-life cases of using big data for marketing

The literature review has shown that there is a large amount of publications on potential gains of big data analytics. However, there is a lack of papers which could describe a full case of a company's implementation of big data marketing from the very beginning to the end and demonstrate changes in the organization's performance. Big data marketing remains to be quite a new area both for researchers and business community and that is why we are facing lack of publications on successful cases and best practices.

Nevertheless, in order to demonstrate how big data analysis resolve marketing problems in practice, let us consider a few representational real-life cases of big data implementation in marketing across different economic sectors.

The case of SFR Company

To begin with, let us examine the project initiated by the *SFR* company in France in 2014 which was centered on customer analytics and *development of 360-degree view of customers* with the help of big data analysis. SFR is the second largest telecommunications operator in France which serves more than 21 million customers and delivers high-speed wired internet to 5,2 million households in France. SFR also operates in the B2B sector and serves over 160,000 business, government and community clients as well.

The business challenge which the company encountered had several sub-problems. First of all, SFR needed to create a mechanism capable of collecting and storing the huge amounts of

data generated by subscribers. Secondly, the company wanted to provide its marketers with real-time data about their customers from a 360-degree perspective. In order to fully understand the customer journey, the company needed to bring in multi-structured data from multiple sources into a single unified platform. In addition, SFR was aiming at creating a detailed view into the customer journey that would be available to employees across the company for real-time search, reporting and analysis.

The customized solution to tackle this problem was delivered to SFR by an external vendor. As a result, the company managed achieved the following business benefits:

- The IT program was installed which managed to create a 360-degree view of customers including a number of characteristics and provide real-time data about customer journeys;
- Data integration strategy was implemented which enabled SFR to ingest, store, and analyze data which could reveal previously hidden customer insights;
- Besides, data integration strategy allowed SFR to improve data-warehouse performance and extending the enterprise data warehouse life up to 3 times.[6]

As we have seen from the literature reviewed, big data marketing is particularly applicable to development of *CRM systems* which have always been generating large amounts of data. That is why the next real-life example of big data marketing is dedicated to the Target corporation and prediction of consumer behavior and upcoming life events.

The case of Target Corporation

Target is the second-largest discount retailer in the USA after the Walmart Corporation. The company is listed among S&P 500 list of companies, has 1 802 locations throughout the United States and operates in several price segments in frames of the bigger, major discount target segment.[7]

Loyalty cards and programs are a useful marketing tool for companies which serve the dual purpose of retaining and attracting existing and new customers and acting as a data source for targeted marketing strategies. For the large Target Corporation the amount of data generated by its loyalty system is monumental and enables the company to derive value from this data with the help of big data analysis. Target resorted to data analytics to execute *the targeting initiative*, as a part of CRM program, which was centered on building a model for the p*rediction of customers pregnancy* (Marketline Case Study, 2014).

Target realized new parents offered the company the perfect opportunity to exploit customer loyalty. According to research, previously ingrained shopping habits fall apart when customers become parents due to various behavioral factors which lead them to becoming more willing to purchase everything conveniently in one place rather than from separate stores, that is

6 Cloudera. Cloudera Enterprise Data Hub in Telecom: Three customer case studies. (2015). From: http://www.cloudera.com
7 Target Corporation. From: https://corporate.target.com

why the corporation decided to use data-driven targeting to benefit from these potential cash cows.

Using the internal records of baby-shower purchases and customer information from existing loyalty cards, the company was able to derive insights from the data and discover specific buying habits attributable for various stages of pregnancy. As a result, Target assigned each shopper a pregnancy prediction score and even an estimate for a due date for customers based on the purchasing habits of around 25 specific products.

However, the retailer made a mistake since the test marketing sessions demonstrated that the changes in CRM system were not always positively perceived because of the specific and delicate nature of the pregnancy topic. Target Corporation implemented some changes (started offering mixed coupons with pregnancy-related and non-related discounts instead of giving out pure pregnancy-specific offerings) and as a result data-driven targeting program started to bring financial returns as expected.

The case of Avis Budget

Let us also have a look at how Avis Budget company is using big data in marketing. Avis Budget is a global car rental company operating two brands and serving more than 40 million customers.

Big data initiative was triggered by the company's objective to get a *deeper understanding of their customers* and as a result to adjust their offerings according to the customers' needs. It is noteworthy that Avis Budget's strategy is centered on the excellence of customer service and customer experience and that is why this project was so important for the organization. Avis Budget planned to develop a *360-degree view of their customers,* apply a *segmentation strategy* on the basis of a customer lifetime value and infuse the *customer experience* with intelligence.

After handling records from 40 million customers, collecting data from its rental transaction system, website transactions and reports that detail what products customers took, the company managed to project how many rentals a person would undertake in a year and what the profit of that person was going to be. The big data project turned out to be an effective investment as the organization began to wring truly more value from its data. All information about customers was consolidated and provided the employees with a single view of every customer. Design of the customer lifetime value model gave Avis Budget a prediction of rental frequency at a customer level and customer profitability. Six segments were identified by the company and this approach increased the effectiveness of the contact strategy by 30%.[8]

8 CSC. How Avis Budget Uses Big Data in Marketing. (2015). From: http://www.csc.com/big_data/insights/97741-how_avis_budget_uses_big_data_in_marketing

All in all, various applications of technology as a marketing instrument are demonstrated in general terms in the publications of Arthur (2013), Feinleib (2014), Weber and Henderson (2014), Bacon (2014), etc. A lot of general information on this issue can also be found in analytical reports and studies (Forbes, 2014,2015; Oracle, 2014; CIO Online Journal, 2014, 2015; Dietrich, Plachy, Norton, 2014).

However, due to the innovativeness of the topic, the specifics of using big data for marketing purposes in real-life business environment have not been clearly defined and examined by researchers.

Theoretical publications by such authors as Minelli, Chambers, Dhiraj (2013), Arthur (2013), Stewart (2015) as well as publications prepared by practitioners from McKinsey (2011) and IBM (Dietrich, Plachy, Norton, 2014) provide a general overview of potential obstacles and barriers connected with big data analysis execution, however they are not examined specifically enough.

Some of these papers (Arthur, 2013; Dietrich, Plachy, Norton, 2014) illustrate obstacles in using big data specifically in marketing, but the majority of them are not based on the real-life cases and are presented in a form of tips and guidelines for companies.

1.4 Big data analysis as a marketing tool: peculiarities of the Russian context

1.4.1 Russian market overview of using big data

Russian market of big data has just recently emerged and currently is in the stage of development. According to some forecasts, it is expected to continue growing at the annual rate of about 35% during 2014-2018.[9] Despite the general downward trend for economic development and overall recession in the country, Russian market of big data shows positive results as demand is rapidly growing and businesses are looking for alternative ways of efficiency increase, risks minimization and costs reduction. Companies are getting more and more interested in the vast opportunities of big data and are step-by-step exploring this new field of advanced business analytics.

Although currently Russia's share in the global market of big data is only 1,8% (according to the amount of accumulated data), it is anticipated to reach 2,2% by 2020. The IDC company evaluates the value of the market as of $ 340 million, 100 of which is generated by SAP solutions and $ 240 million account for IBM, SAS, Oracle, Microsoft and other major providers.

9 Rusbase. Rostelekom is planning to by a Russian Big data company for $8 dollars. (2015). From:http://rusbase.com/news/ros-aikumen/

According to the survey by CNews Analytics and Oracle (2014), respondents of which represented 108 large organizations from various industries demonstrates that a third of Russian companies have just started to use big data technologies in their businesses. However, only 10% of survey participants are in fact using big data analytics in their businesses while the world's average is about 30% of all business entities in the country. Following the global trend, Russian companies from retail, telecommunications and financial services industries resort to big data solutions more frequently than others, yet logistics, mining and utility companies and governmental organizations have also started to use this opportunity.

Although major providers of big data solutions are foreign IT giants, such as Oracle, IBM, SAP, SAS, Microsoft, Hortonworks, EMC, Cloudera and some others, Russian companies (e.g. Mail.ru Group, Yandex) also form a part of the market.

The following trends can be seen as major market drivers and barriers influencing the Russian market of big data:

Market drivers:

- Increasing awareness and growing interest of Russian companies in big data opportunities;
- Continuous economic crisis is forcing companies to look for alternative ways for costs reduction and efficiency increase, and big data analysis is one of such alternatives;
- General economic recession and sharp decrease of Russian currency will favor Russian solutions providers in comparison with more expensive foreign market players;
- Import substitution in IT industry which will have a positive effect on development of Russian big data solutions;
- Recent legislation requiring Russian companies to store all data solely on Russian territory.

Market barriers:

- Privacy and confidentiality issues and lack of relevant legislation on big data;
- Lack of competent experts in big data analytics;
- Difficulty in implementation of big data analytic in currently operating enterprise information systems;
- High expenses necessary for big data technology development which makes it more complicated for Russian IT companies to start new initiatives;
- Increased prices of imported goods, continuous inflation and overall political instability will have a negative impact on development of the whole IT industry.

As a result, factors that affect Russian market of big data combine both global trends and trends attributable only to Russia and represent both positive and negative influence. Country-specific market trends, connected with the current economic crisis and recent legislation

changes, are likely to have a rather positive effect on implementation of technology by Russian companies. However, it is important to mention that the implementation of big data analysis will be successful only if a company has sufficient financial resources and can afford investments in big data initiatives.

The major part of the market barriers, which have been mentioned earlier, is however reflecting global trends. Today the global market of big data execution by companies is still at the stage of development. In addition, not only Russia, but the business community all over the world is struggling with the lack of competent human resources for big data analysis.

1.4.2 Real-life cases of Russian companies working with big data as a marketing instrument

Regarding the applications of big data analysis by Russian companies, it varies from optimization of operations, security problems to marketing-based issues. A brief overview of the most successful segments of big data applications in Russia is demonstrated below in the table.

Table 3 Profitability of different segments of big data applications in Russia (2013)

Segment	Total income (2013) ($ million)	Total market share (2013) (%)	Market growth rate (2012-2013)
BI-platforms	8 550	59,5	8,8
CRM-systems	2 735	19	5,1
Analytical applications & optimization of business processes	2 001	13,9	5,8
Advanced analytics	1 082	7,5	12,5
In total:	14 368	100	7,9

Source: Cnews. Overview of business analytics and big data in Russia in 2014. (2014). From: http://www.cnews.ru/reviews/bi_bigdata_2014/articles/perspektivy_biznesanalitiki_v_rossii

Marketing problems are one of the top issues which are addressed by Russian business leaders by the means of the new technology. Big data analysis is generally used for advanced customer analytics, segmentation, targeted advertising and performance evaluation.

Analysis of recent statistical report of 16 biggest big data projects among Russian companies in 2014 demonstrates that the prevailing share of projects belong to finance and telecommunications companies and 90% of projects were initiated to solve marketing-related problems among others.[10]

10 Cnews. The largest big data projects in Russia. (2014). From: http://www.cnews.ru/tables/a9249186ccefd9e546774ec36da1970ba20ca212/

The list of companies, who have already adopted big data technology as a marketing instrument, include all major Russian market leaders among telecommunications companies (Vympelkom, Megafon, MTS Group), a number of national retailers (Ulmart, Lenta, X5 Retail Group, Gloria Jeans) as well as banks (VTB24, Alpha Bank, Sberbank) and government institutions (Federal tax authorities).

The research demonstrates that these companies execute big data analysis in several ways. The majority of organizations build partnerships with external providers, both Russian and foreign ones, and receive ready-to-use analytics or software to run it in-house, other companies focus on developing their internal competences of big data analysis.

However, only a small share of companies has already started using big data for marketing purposes (31%), the majority is either planning to implement big data analysis in their organizations (25%) or do not consider this opportunity at all (44%).[11]

The case of Incity

Let us have a look at a few successful cases of big data application in marketing by Russian companies. According to Boris Mikhalkin, Business analytics Manager of Incity company which is a large Russian fashion retailer, in 2013 Incity launched a comprehensive big data analysis initiative together with the Qlikview company. This project was aimed at improving efficiency of marketing actions among other project objectives and as a result allowed the retailer to evaluate effectiveness of marketing campaigns and optimize CRM actions.[12]

The case of War Gaming

Another example can be demonstrated by collaboration of War Gaming company and Yandex Data Factory which started in December, 2014. Generally speaking, Yandex Data Factory uses big data processing and machine learning to provide various businesses with meaningful solutions in a number of areas. As for the field of marketing-related issues (Marketing & Customer relationship management, as the organization itself specifies this division), the company works on the following questions: recommendation systems, personalization, churn prediction & prevention.

As for the project for War Gaming, Yandex Data Factory was required to improve churn prediction and maximize its prevention. Yandex was working with raw customer databases of War Gaming: the company analysed the customers' data and clustered customers according to a number of characteristics. Afterwards, the model was built which contained a number of

11 Cnews. Overview of business analytics and big data in Russia. (2014). From:http://www.cnews.ru/reviews/bi_bigdata_2014/articles/bolshie_dannye_v_rossijskoj_interpretatsii

12 Cnews.Overview of business analytics and big data in Russia. (2014). From: http://www.cnews.ru/reviews/bi_bigdata_2014/interviews/boris_mihalin

variables and could identify the specific segment of potential churners and predict the probability of a switch by a "churner".[13]

As for the market trends and barriers for big data analysis as a marketing tool, they are similar to the development of big data analytics market as a whole and include legislation restrictions, stagnation of IT sector, lack of competent specialists and early stage of technology adoption among companies and insufficient understanding the importance of organizational data strategy at a corporate level. Prevailing part of the companies do not see clearly the benefits of big data adoption and for some of them big data phenomenon is considered just as the natural further development of business analytics, not a technological breakthrough instead.

To summarize analysis of publications dedicated to the peculiarities of the Russian context, the reviewed literature has demonstrated a variety of analytical reports on general perception of the technology by Russian companies (Cnews, Oracle, 2014), but there is a small number of studies which focus on real-life cases and analysis of obstacles faced by Russian companies in big data execution as a marketing tool.

All in all, based on the literature review the research gap has been revealed between the publications dedicated to big data analytics as a marketing tool in general, both from the global and Russian market perspectives, and evaluation of practical implementation of this technology by Russian companies for the marketing purposes. Although there is a number of research papers dedicated to the benefits of big data analytics in marketing or analytical market overview reports there is a lack of research done on how Russian companies handle big data technology as a marketing tool, what obstacles they are facing and how they themselves evaluate this technology.

Besides, on the one hand big data analytics as a marketing tool is a highly innovative topic in research, yet on the other hand several Russian companies have already started adopting this technology.

Based on these findings from the theory review this study is considered to be a subject of *exploratory research* and contain analysis of real-life evidence.

The major *research questions*, which aim to investigate the phenomenon and reveal the factors impacting current practices of Russian companies, form a basis for empirical part of this study:

1. Why Russian companies resort to big data analytics as a marketing tool?
2. How do Russian companies execute big data technology as a marketıng tool?
3. How do Russian companies overcome barriers connected with big data analysis as a marketing instrument?

13 Yandex data factory. World of Tanks achieves a new level of churn prevention through the implementation of YDF's data analysis. From: https://yandexdatafactory.com/case-studies/world-of-tanks-achieves-a-new-level-of-churn-prevention-through-the-implementation-of-ydfs-data-analysis/

4. How can Russian companies leverage the expertise of global market leaders in order to empower big data analytics for marketing purposes in Russian market?

Therefore, exploratory nature of these research questions implies that the most appropriate research method for this study is *multiple case study research*. A more detailed perspective on the justification of the research method is provided in the Chapter 2 of this study.

Research Gap

The review of relevant theoretical literature has demonstrated that big data analysis as a marketing tool is a highly innovative topic not only in the field of business practices, but also in the field of research.

To begin with, opportunities and potential gains of big data analysis for business are well illustrated in today's theoretical literature (Minelli, Chambers, Dhiraj, 2013; Davis, 2014; Feinleib, 2014) as well as in publications prepared by practitioners (McKinsey Global Institute, 2011; Columbus, 2014, 2015; Nayler, 2014), yet they mostly represent positive attitude towards technology implementation and therefore reflect current interest in big data analysis.

Concerning possible applications of technology as a marketing instrument, they are demonstrated in general terms in the publications of Arthur (2013), Feinleib (2014), Weber and Henderson (2014), Bacon (2014), etc. A lot of general information on this issue can also be found in analytical reports and studies (Forbes, 2014,2015; Oracle, 2014; CIO Online Journal, 2014, 2015; Dietrich, Plachy, Norton, 2014).

However, due to the innovativeness of the topic, the specifics of using big data for marketing purposes in real-life business environment have not been clearly defined and examined by researchers.

Theoretical publications by such authors as Minelli, Chambers, Dhiraj (2013), Arthur (2013), Stewart (2015) as well as publications prepared by practitioners from McKinsey (2011) and IBM (Dietrich, Plachy, Norton, 2014) provide a general overview of potential obstacles and barriers connected with big data analysis execution, however they are not examined specifically enough.

Some of these papers (Arthur, 2013; Dietrich, Plachy, Norton, 2014) illustrate obstacles in using big data specifically in marketing, but the majority of them are not based on the real-life cases and are presented in a form of tips and guidelines for companies.

Regarding the Russian context, the reviewed literature has demonstrated a variety of analytical reports on general perception of the technology by Russian companies (Cnews, Oracle, 2014), but there is a small number of studies which focus on real-life cases and analysis of obstacles faced by Russian companies in big data execution as a marketing tool.

To sum up, on the basis of identified research gaps after the literature review this research study will be centered on investigation and analysis of specifics and obstacles of execution of big data analysis as a marketing tool by Russian companies and will be based on real-life case studies of Russian companies.

Summary of Chapter 1

In the first chapter we have reviewed relevant theoretical literature as well as research studies conducted by practitioners dedicated to the big data analysis and execution of this technology for marketing purposes.

As a first step, the major contemporary marketing tools have been briefly reviewed, including all elements of marketing strategy planning and execution, analysis of marketing processes, introducing such concept as 4P's marketing mix, 4C's and 4A's models, etc.

After the evolution of big data as a technology for business has been introduced, all key definitions of big data analysis have been reviewed including such concepts as business intelligence, machine learning, data mining, etc.

Besides, we have demonstrated that the impact of big data on business is extremely diverse and include solutions for all business functions, starting from procurement, manufacturing and logistics to pricing, marketing and customer service.

As for the organizational function where big data analytics are applied most frequently, we have revealed that a substantial part of results of the analytics are used by marketing, IT, sales and R&D departments and for solving customer-related problems (54%) and operational issues (22%) where big data technologies have a lot to offer (Datameer, 2014).

The global market of big data has been reviewed and major global market players have been introduced. Global market of big data is expected to grow from 27 billion dollars in 2015 up to 100-110 billion dollars by 2020 (Networkworld, 2014). Besides, market trends and barriers have been examined.

From the industry perspective, top 5 industries which are the biggest adopters of big data technology are the following (Datameer, 2014): financial services account for 22%, tech companies – 16%, telecommunications' sector use big data account for 14%, retail – 9% and healthcare – 7%.

In addition, it has been illustrated that marketing applications of big data analysis are truly diverse. The technology can address such processes as segmentation and targeting, develop models for prediction of customers behavior and development of 360-degree view of customers, analyze customer lifetime value and measure performance of marketing actions.

The literature review helped to identify key success factors in implementation of big data analysis in marketing and most common barriers, both technology- and non-technology-based.

Real-life cases have been analyzed of such companies as SFR (France), Target (USA) and Avis Budget (USA).

Regarding the context of the Russian market, we have revealed that Russian companies also have started to use big data analysis for solving marketing-related problems and introduced

several real-life case studies (Incity, War Gaming & Yandex Data Factory). Although currently Russia's share in the global market of big data is only 1,8%), it is anticipated to reach 2,2% by 2020 (Cnews Analytics, Oracle, 2014).

The factors that affect Russian market of big data combine both global trends and trends attributable only to Russia and represent both positive and negative influence. Country-specific market trends, connected with the current economic crisis and recent legislation changes, are likely to have a rather positive effect on implementation of technology by Russian companies. However, it is important to mention that the implementation of big data analysis will be successful only if a company has sufficient financial resources and can afford investments in big data initiatives.

The major part of the market barriers, which have been mentioned earlier, is however reflecting global trends. Today the global market of big data execution by companies is still at the stage of development. In addition, not only Russia, but the business community all over the world is struggling with the lack of competent human resources for big data analysis.

Chapter 2. Research design

2.1 Overview of the research methodology

This chapter is dedicated to the introduction of main research questions and a detailed step-by-step description of the research methodology of this paper.

The overview of the literature in the previous chapter has demonstrated a research gap between analyzed publications of researchers and business practitioners and as a result the *exploratory* nature of this study has been introduced and justified.

As previously stated, the major *research questions* of this study are the following:

1. Why Russian companies resort to big data analytics as a marketing tool?
2. How do Russian companies execute big data technology as a marketıng tool?
3. How do Russian companies overcome barriers connected with big data analysis as a marketing instrument?
4. How can Russian companies leverage the expertise of global market leaders in order to empower big data analytics for marketing purposes in Russian market?

Exploratory nature of these research questions implies that the most appropriate research methods for this study will be *multiple case study research*.

Research design of this study will be based on collection of both primary and secondary data and include analysis of both quantitative and qualitative data. A more detailed description of the methodology will be introduced later on in this chapter.

2.2 Justification of the suitability of a case study analysis as a research method

To begin with, let us introduce several most relevant definitions of a case study as a research method.

In order to get a general understanding of the case study method, it is a good idea to refer to Schramm who believes that "the essence of a case study...is that it tries to illuminate a decision or set of decisions: why they were taken, how they were implemented, and with what result." (Schramm, 1971)

A more thorough explanation of this methodology is provided by Yin (Yin, 1981a, 1981b), according to whom a case study is best described when taking into consideration its twofold structure. Therefore, the first part of Yin's definition is more concerned with the *scope* of a case study:

"A case study is an empirical enquiry that investigates a contemporary phenomenon in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident. "

The second part of the definition describes *features* of a case study:

“A case study enquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis. “

In order to justify the suitability of the case study research methodology, let us refer once again to Yin and his publication “Case Study Research. Design and methods”. According to the author, there are three major conditions which should be met in a research to justify that the preferred methodology of the paper is case study research. Let us follow Yin’s guidelines and demonstrate the suitability of this methodology for this study.

1. First of all, the first three research questions of this paper focus mainly on ‘’how” and “why” questions which indicates explanatory nature of the study where case study method works at best.
2. Secondly, this research paper examines only contemporary events and analyzes an extremely innovative topic of implementation of big data analytics in marketing by Russian companies. Due to the innovativeness of the study other methodological approaches are unlikely to provide reliable results. On the contrary, case study method will illustrate real-life evidence and demonstrate the specifics of execution of the new technology by organizations.
3. It is also worth mentioning that the relevant behaviors, studied in this paper, cannot be manipulated: the researcher will only observe the relevant events, analyze relevant documentation and interview the persons involved in the process.

2.3 Overview of the case study analysis

The *case study questions* are the following:

1. Why Russian companies resort to big data analytics as a marketing tool?
2. How do Russian companies execute big data technology as a marketıng tool?
3. How do Russian companies overcome barriers connected with big data analysis as a marketing instrument?

As stated before, the topic of this paper is likely to be the subject of exploration where it is recommended not to have any study propositions, which would drive in a certain way the whole further case analysis and could possibly provide biased outcomes.

On the contrary, let us define *the exploration purpose* of this case study which will be to get a deeper understanding of the peculiarities of usage and implementation of big data for marketing purposes by Russian companies.

Necessary *criteria for the exploration* will be the following:

1. To analyze only Russian companies operating mainly on the Russian market;

2. To ignore such fact as the size of the company and its market share in choosing an organization to be analyzed;
3. To focus on the industries and market sectors with the strategic importance of marketing division (e.g. telecommunications, retail or FMCG);
4. To focus on potential gains of big data technology solely for the purposes of marketing;
5. To reveal and examine company-specific, industry- and country-specific factors which influence organizations' decisions whether to resort to big data or not.

It is crucial to mention that case study methodology will address *multiple cases* (preferrably 3-4) which will improve the external validity of research results.

Yet it is also noteworthy that due to the number of cases planned to be analyzed and exploratory nature of the study the research design will be *adaptive*, so that any non-fundamental changes in the research design procedures can be implemented at any stage of the research.

We believe that in this study the most appropriate defined *unit of analysis* will be the Marketing department of a Russian company operating on the Russian market, since this organizational unit is the centre of using, implementing and evaluating results of big data analytics technology.

Limitations of the unit of analysis are defined by the boundaries of the department itself meaning that it is out of scope for this case study research to analyze the impact of big data on development of any other organization's departments.

Regarding relevant *criteria for case study's findings interpretation* and taking into account exploratory nature of the study, we will resort to the analytical generalization of research findings and comparison of these findings with similar findings about foreign companies using big data in marketing, which were addressed previously in Chapter 1 during the literature review.

Due to the fact that this paper addresses analysis of multiple case studies, we will use replication logic, which is similar to the methodology of multiple experiments, and therefore ensure external validity of research findings. Thanks to the innovativeness of the technology and low rate of adoption of big data analytics as a marketing tool by Russian companies, we will resort to both *literal replication* (cases predict similar results) and *theoretical replication* (cases predict contrasting results for anticipatable reasons) in this multiple-case study analysis.

The overview of step-by-step procedures of multiple-case study analysis of this paper is demonstrated below:

Step 1: Defining and designing the cases

1. Review of the relevant literature (accomplished in Chapter 1)
2. Selection of relevant cases (based on the exploration criteria)
3. Design of data collection procedures

Step 2: Data collection and data analysis

1. Execution of 4 case studies
2. Preparation of individual case reports

Step 3: Findings analysis and derivation of conclusions

1. Drawing cross-case conclusions
2. Comparison of research findings with the literature reviewed
3. Development of policy implications and recommendations for the companies
4. Preparation of a cross-case report

2.4 Data collection procedures

The data collection process starts with definition of *selection criteria* for the companies to be interviewed. Although overall exploration criteria for the case study research have already been introduced, company selection criteria focus only on aspects which make a company an interesting and at the same time relevant and reliable for exploration.

1. As this study is primarily concerned with the analysis of practices of Russian companies, an organization should be registered as a Russian business entity and operate mainly on the Russian territory;

2. An organization should preferably belong to the industry where large amounts of data are generated (retail, telecommunications, financial services, etc.)

3. A selected company should also preferably belong to a customer-oriented market sector with high importance of Marketing division in the organizational structure;

4. A company should be currently using big data analysis for marketing purposes.

As a result, the following companies have met all set requirements and have been selected for further analysis: MTS Group together with another major Russian mobile services operator as representatives of the Russian telecommunications industry; Lenta and Ulmart as some of the largest retailers (offline and online) in the Russian market. All selected organizations have a 2-3 record of using big data analytics for marketing purposes, operate on a national scale, in B2C segment and are customer-oriented.

As long as 4 Russian companies have been selected for further analysis of their Marketing departments on the basis of the exploration criteria, let us move on to the stage of data collection. In order to improve the construct validity of the research *multiple sources of evidence* are collected and analyzed.

Interviews with representatives of Marketing departments (preferably Marketing directors) of the Russian companies will represent the main source of evidence. This information source has been selected as the major one since it targets directly case study issues and can provide us with insights and personal viewpoints on the topic. *Documentation* and a*rchive*

records (all relevant and available data about organizations examined) will work as a supporting source of evidence.

Units of data collection are the following:

- Company's internal data for analysis of documentation and archival records
- Individuals (Marketing directors or any other representatives of the Marketing division of an organization with the relevant expertise) for analysis of interviews.

As the main data collection method is interviewing let us discuss questions which companies' representatives should give answers to.

The main goal of conducting an interview is to obtain real-business data about gains, opportunities, obstacles and all possible peculiarities of using big data in marketing at an organization in Russia. Although during the literature review several international surveys on managerial implications of big data technology have been reviewed, we would like to use as a benchmark with slight modifications questions from the "Big data survey Europe. Usage, technology and budgets in European best-practice companies" (2013). This survey, targeted though at European market players, includes questions on very relevant and significant issues for our study.

A structure of an interview will contain questions about the company's general attitude towards big data analytics, case-specific questions and a few wrap-up questions about the expertise of foreign companies in this field, which can help us to get some insights about the last research question of this paper.

The planned list of questions for an interviewee is demonstrated below:

1. What was the main reason for initiating analysis of big data in your organization and which factors triggered this initiative?
2. In which departments does your company use big data analysis and which problems are addressed by this technology?
3. What was the main reason for initiating analysis of big data in your organization *as a marketing tool* and which factors triggered this initiative?
4. Which marketing-related problems are addressed with big data technologies in your company?
5. Which areas of using big data in marketing would you evaluate as the most attractive and promising (in short-term / mid-term perspectives)?
6. What kind of data do you analyze (at the moment and planned)?
7. What problems have you encountered when using big data?
8. Has the company achieved stated goals of the Marketing division of your company through using big data analysis and which obstacles did your organization face?
9. Is there a comprehensive strategy for big data in the Marketing department of your company?
10. What are the metrics which are used for big data marketing at your company?

11. Where does the big data analysis take place in your company from the perspective of the organizational structure?
12. Which technologies and big data providers do you use or plan to use in your company for big data analysis?
13. How would you assess the level of market development of big data solutions providers in Russia?
14. Which alternative innovative solutions for marketing would you consider as most attractive ones and what is the relative attractiveness of big data solutions?

2.5 Analysis of case study evidence

In order to provide meaningful results from the analysis of case study evidence, we aim at developing *convergence of evidence*. In this case data triangulation from multiple sources of evidence will provide multiple measures of the same phenomenon. Therefore, the multiple-case studies findings will be supported by more than a single source of evidence, each of the cases analyzed separately.

A report of each company case will include the following elements:

- key information about an organization (industry, number of employees, competitive position in the market and some other indicators);
- demonstration of all relevant data analyzed through documentation and archival records;
- analysis of the data collected via interviews.

To analyze findings of multiple cases conducted, we plan to use *explanation building* which is very similar to the approach of multiple experiments. Each case is analyzed and explained separately and all results are revised and compared with all other cases and rival explanations addressed in the literature.

Summary of Chapter 2

In the Chapter 2 we have introduced the methodology that is used in this research study, which consists of 2 major elements: case study analysis and benchmarking, and justified the suitability of the chosen methods.

We have also revealed the fact that this study is a subject of *exploratory research* which will be based on the analysis of real-life evidence.

Major research questions have been also defined in this chapter. The first three research questions, which specifically target Russian market and Russian companies, will be analyzed with the help of case study analysis. In order to answer the fourth research question on comparison of global practices with peculiarities of Russian market benchmarking method will be used.

Research design of this study will be based on collection of both primary and secondary data and include analysis of both quantitative and qualitative data.

Besides, *the exploration purpose* of this case study has been introduced, which is to get a deeper understanding of the peculiarities of usage and implementation of big data for marketing purposes by Russian companies. Necessary *criteria for the exploration*, *unit of analysis* and *unit of data collection* have also been defined.

Moreover, the whole *process of data collection* and *analysis* were illustrated in this chapter.

Chapter 3. Empirical Research

3.1 Empirical results of the study

3.1.1 General overview of the investigated companies

In order to analyze the current practices of Russian companies of big data analysis as a marketing instrument four large national market players have been selected: MTS Group, one major national mobile services provider, Ulmart and Lenta.

Table 4 General characteristics of the explored companies

Name of the company	**MTS Group**	**A major Russian telecommunications company**	**Lenta**	**Ulmart**
Industry	Telecommunications	Telecommunications	Food retail	Online retail
Amount of data generated by the company	Extremely large (77,3 million subscribers)	Extremely large (74,8 million subscribers)	Extremely large (8,5 million active loyalty cards users)	Extremely large (1,5 billion active users)

Although selected organizations belong only to two industries, telecommunications and online and offline retail, it is crucial to understand that currently in these economic sectors (apart from a few other industries) of the Russian market big data marketing is in fact applied and huge amounts of data are generated. Let us briefly introduce these companies and their role in the Russian economy.

1. Founded in 1993, MTS Group is the leading telecommunications group in Russia, Central and Eastern Europe which provides wireless Internet access and fixed voice, broadband and pay-TV to over 100 million customers. In 2015 MTS's total subscriber base has increased by 3,6%, which is the lowest percentage among the "Big 3" players of Russian telecom industry, and amounts to 77,3 million people.[14]

To get a better understanding of the role of technology for MTS Group, it is important to understand the market trends and current strategic vision of the company.

Telecommunications industry has been recently going through the transformation stage. Rapid development of Internet and emergence of substitutes of traditional mobile services (e.g. video communication services such as Skype or Facetime, messengers such as Whatsapp, Viber, etc.) today are offering customers services of the same or better quality and broader functionality at very low or, in most of the cases, zero prices. Therefore, telecommunications industry all over the world has started to change the focus of their business and are now in the phase of turning into a pure Internet provider.

14 MTS Group. From: http://www.mtsgsm.com/

The importance of the "voice" as a primary service of a classic telecom company is dramatically decreasing and the organization is fully aware of this trend. However, "voice" as an asset is still bringing good financial returns to the company and that is why the company is not planning to fully undergo this transformation in the nearest future.

During the interview with the Senior Marketing Manager of the Strategy & Planning department of MTS Group the following information was disclosed: the total revenue in 2015 reached the level of 391,2 billion rubles and was the largest volume among the "Big 3" players, 76% of which are represented by the revenue generated by *mobile services*. However, the revenue volume, generated by the *data transfer*, constituted 20% (77,2 billion rubles) in 2015. Moreover, this value demonstrates a 20% increase in demand for data transmission in comparison with 2014.

In addition, it is worth mentioning that due to very low prices of a SIM card Russian customers tend to change mobile providers extremely often, looking for more attractive offerings. Churn rates in the telecom industry in Russia are impressive - scoring up sometimes to 40-60%. In the case of MTS Group, churn rate is equal to 40% which forces the company to look for ways to prevent customer from changing a mobile service provider.

2. The second selected company is a leading Russian universal telecommunication service provider, operating in all segments of the telecommunications markets in Russia. The company is well-known for its innovativeness and passion for technology. The subscriber base of the organization amounts to 74,8 million people in 2015 which is a 7,2% increase in comparison with the last year.

The industry trends, discussed earlier by the example of MTS Group, have the same influence on this organization as they have on MTS. This company is still having a commercial focus on conventional mobile services, however the organization is also concerned about the importance of data transfer as a newly-emerged revenue source. As a result, today the company is very much concerned with looking for alternative ways to *increase sales*, retain customers' loyalty and minimize churn rates.

3. The Lenta company was one of the first ones among other Russian retailers who has started to work with big data analysis across different directions in 2013. Founded in 1993, today Lenta is the top retail company in Russia in terms of the total sales floor space and 5th in terms of sales revenue (2015). The company operates in food retail, and has an established network of 142 hypermarkets in 70 Russian cities and 38 supermarkets in Moscow and St. Petersburg (March, 2016).

4. Finally, Ulmart is the Russian leader on online retail and the fifth largest Internet company of the country. Founded in 2008, the company has managed to develop from a small

online seller of consumer electronics to the national e-commerce giant. Financial performance demonstrates the company's success in the market: in 2014 the company achieved $1,6 billion sales growth. Ulmart is growing twice as fast as the whole e-commerce sector due to rising financial opportunities of the Russian community seeking to fulfill demand for high-quality products with efficient post-sale services and reliable delivery.

Ulmart is a very representational example of a successful player in the Russian internet retail market. Data analysis and business analytics have always played a crucial role for this organization as the company deals with loads of transactional data on a daily basis. The emergence of new opportunities triggered by big data analysis was quickly adopted by the company and is now been implemented across several business processes and, above all, in marketing.

Before introducing a more detailed analysis of current practices of investigated companies, let us give an overview of the structure of results presentation.

1. First of all, the process and the reasons for technology adoption will be discussed;
2. Secondly, the role of big data analysis as a marketing tool will be illustrated in frames of organizational structures of every company;
3. Thirdly, the variety of marketing applications of big data analytics will be addressed with a special emphasis on:

- What *kind of data* is analyzed by the company;
- What sort of *marketing analytics* is executed by the company with big data analysis;
- Which *marketing processes* are optimized with the help of technology;
- Which *metrics* are applied to measure performance of data-driven marketing tactics;
- How companies evaluate *effectiveness* of data-driven marketing initiatives at their organizations;

4. Major obstacles which investigated companies are struggling with in using big data analytics for marketing purposes will be illustrated;
5. The role of alternative innovative business solutions will be discussed.

3.1.2 Adoption of big data analysis as a new technology for marketing and its role in the organizational structure

Let us analyze how big data analysis for marketing purposes is implemented by Russian companies as a part of their organizational structure.

Table 5 Adoption of technology & Big data marketing as a part of the organizational structure

Name of the company	**MTS Group**	**A major Russian telecommunications company**	**Lenta**	**Ulmart**
Year of technology adoption	2013-2014	2014	2013	2014
Big data marketing as a part of the organizational structure	CRM department of the Marketing division	Marketing & Sales departments	CRM department of the Marketing division	Marketing and Advertising office, Strategic analysis and scenario planning department

As it is seen from the table, all companies have started to apply big data analytics only several years ago, and today technology is executed for the purposes of Marketing departments of the organizations. The case of every company is unique and different and that is why let us discuss each case separately.

1. The MTS Group has started working with data quite a while ago - as a part of *database management* and *business analytics*. Although MTS has hired a new team of IT professionals to build analytical models and work closely with big data, the organizational structure of the company hasn't changed much after the company officially started to analyze big data.

The interview has revealed that MTS is using big data mostly for marketing purposes. Big data is being handled solely by the company's technology experts in *CRM department of the Marketing division* and there are no other employees involved in big data analytics outside of the Marketing division.

2. According to the available information about the second selected telecommunications company, the organization's capabilities of analyzing large data sets are truly impressive. Nowadays every second there are 600 000 actions and events taking place at the company and the system is capable of analyzing this information in real-time.

This company has started considering big data analysis around 4-5 years ago when this topic gained a lot of attention from the business community throughout the world. The interview with the Marketing director of the organization for the North-West region revealed that although there is a general understanding of the need to benefit from big data opportunities, there is no overall strategy in the organization towards managing big data on a corporate level.

In the organization big data analysis is widely applied at Sales & Marketing divisions (*commercial applications*) which have started to use this technology in 2013-2014. However, big part of big data analysis is used for the resolving *technical issues*.

As it was discussed in the theoretical chapter (Arthur, 2013), the lack of the data enterprise strategy is a very common practice among companies who have already started to use big data analysis, but have not yet understood the importance of building a comprehensive data strategy for the whole organization.

Moving to the second analyzed market sector, retail is one of the industries which has always been working hand in hand with large volumes of data. The rapid technological development of big data analysis enabled retailers throughout the world to derive valuable insights of the databases possessed and as a result improve performance of the company.

3. The Lenta company was one of the first ones among other Russian food retailers who has started to work with big data analysis across different directions in 2013. Today Lenta considers big data analysis as a promising growth opportunity which will help to create additional capabilities and strengthen the competitive position of the company.

It is crucial to mention the importance of existing CRM practices of Lenta which create a basis for data collection and its further analysis. Big data marketing at this company takes place at the *CRM department* of the Marketing division.

The similar approach to big data analysis in retail was illustrated in the first chapter of this study by the case of Target Corporation who also put CRM practices in the centre of big data analysis at the company. Besides, the research of theoretical and practical publications has also revealed that particularly for the retail sector loyalty cards and checks are the two most important information sources which further on can be transferred into valuable insights about customers behavior.

4. Another Russian retailer Ulmart started to resort to big data analysis approximately in 2014 as a part of its *business analytics* practices. In the opinion of the Ulmart representative, there is a lot of unclarity concerning when conventional business analytics were taken over by the era of big data analysis in the company, since the organization was analyzing the same vast amounts of transactional data as in all previous years.

Ulmart defines big data not by its volume, but rather by emphasizing the marketing perspective of the definition, velocity of data and emergence of advanced mathematical models for processing data in real-time.

Therefore, we can conclude that Ulmart is determined to benefit from this new promising technology, which is demonstrated by the top management's interest expressed in mass media. Yet it is important to keep in mind that the Russian largest online retailer has always been putting

an emphasis on business analytics and particularly web-analytics. That is why at the middle level of the organization big data analysis initiatives are unlikely to be considered as a major technological shift in Ulmart's practices.

Concerning the place of big data analysis in frames of the organizational structure, marketing-related big data analytics are executed inside the *Marketing and Advertising office*, in the *Strategic analysis and scenario planning department*. Marketers of Ulmart also work hand in hand with the so-called WEB Platform division which is responsible for managing a variety of technological (namely IT) issues and a number of external IT providers.

3.1.3 Introduction to the real-life practices of big data marketing

Theoretical research, which has been justified by the empirical part of the study, has demonstrated that big data analysis at an organization can be executed in two different ways with different amount of investments required.

An organization can start *collaboration with an external vendor* of data analytics, a competent IT company, which will provide a client on a regular basis with ready-to-use analytics. This outsourcing approach requires much less financial investments and internal organizational changes than another alternative which is based on *building internal capabilities of big data analysis* and developing a complicated comprehensive data strategy for the whole organization.

The empirical part of the research has demonstrated that Russian companies tend to favor the first, faster and less expensive approach to big data analysis which allows them to benefit faster from technology adoption and jump over the difficulties of implementation of an internal organizational change.

Let us demonstrate an example of a similar practice by Lenta. Since 2013 the food retailer has been collaborating with the IT company Emnos which has international expertise in conducting advanced customer analytics for retailers. The retailer provides its partner with the generated datasets while Emnos processes this information and shares with Lenta ready-to-use customer analytics.

Lenta has started to collect the data about its customers in 2008 which was quite early in comparison with other competitors and now has a significant record of valuable information about its customers. For the collaborative big data project together with Emnos the data from 2010 has been used which enables Lenta to get a clear understanding of existing behavioral patterns of its customers.

All in all, the specifics of the execution of big data analysis is similar to the prevailing share of cases of both foreign and Russian companies, analyzed during the theoretical as well as

empirical parts of the research (SFR, Incity, War Gaming, MTS Group, Ulmart.ru). An organization starts to cooperate with an external vendor who possesses valuable competences in the technology and can optimize the process of data analysis for a client.

3.1.4 Data sources for big data marketing execution

To begin with, it is important to demonstrate which sources of information Russian companies use for execution of big data marketing. A brief overview is illustrated in the Figure below.

	MTS Group	**A major telecommunications company**	**Lenta**	**Ulmart.ru**
Conventional data sources	Billings information; Customer data; Data from text messages & calls; Electronic data interchange	Billings information; Customer data; Data from text messages & calls; Electronic data interchange	Transactional data; CRM data from loyalty cards; Electronic data interchange	Transactional data; Electronic data; interchange; CRM data; Customer data
Recently emerged data sources	Internet data; Traffic consumption; Diverse geospatial data; Multidimensional mobile devices data; Telemetry; RFID devices data	Internet data; Traffic consumption; Diverse geospatial data; Multidimensional mobile devices data; Telemetry; RFID devices data	Are unlikely to be used	Multidimensional Internet data; Mobile devices data; Frequency and duration of searching through the website

Fig. 3 Analysis of data sources used for big data marketing

In the first theoretical chapter of this study two major types of data sources have been defined, with *conventional* data describing traditional enterprise data and *recently emerged* data referring to all sorts of data which emerged with the rapid development and adoption of IT and Internet by businesses as well as consumers.

The table demonstrates that generally speaking Russian companies use a combination of data sources for execution of big data marketing. However, it depends severely on the industry where a company operates how technologically advanced the information generated by an organization or its customers is: telecommunications companies use a lot of data, which has just recently emerged as a data type, while a bricks-and-mortar food retailer Lenta still focuses on conventional data types in their analysis.

The data which representatives of the Russian telecommunications sector have at their disposal, is truly diverse and include the following information:

- Customer locations and customer journeys;
- Billings information;
- Multi-dimensional data on consumption of mobile services, text messages, etc.;
- Content of the text messages;
- Information about recipients of calls and text messages;
- Multi-dimensional information about the internet traffic and data consumption.

During the empirical research major types of data for the Ulmart company have also been revealed. The company, which today has in total 30 000 daily orders and 1,5 billion active users, has both internal and external information systems which ensure accumulation, processing and analysis of big data:

- *Internal information systems:* ULMART website, SAP (Business Intelligence, ERP, CRM), Oracle Database;
- *External information systems:* Google Adwords, Yandex metrics, an analytical program of customer recommendations, a system of prices monitoring, etc. [15]

Since Ulmart belongs to the sector of e-commerce, it is unsurprising that special attention in the organization is paid towards such internal information source as the company's website (the so-called *streaming data*). It includes data about almost everything that customers do on the website:

- purchasing history;
- time used for searching;
- type of device from which the search was conducted;
- customer preferences;
- frequency of using the website;
- socio-demographic data of customers;
- variety of advertising tools through which a customer has gone through before landing at the Ulmart's website.

3.1.5 Marketing processes optimized with big data analytics

Before starting a discussion of which marketing applications of technology are most commonly used by Russian companies, let us refer to the theoretical review and the overview of marketing strategy processes.

15 Ulmart. For investors. From: http://investors.ulmart.ru/

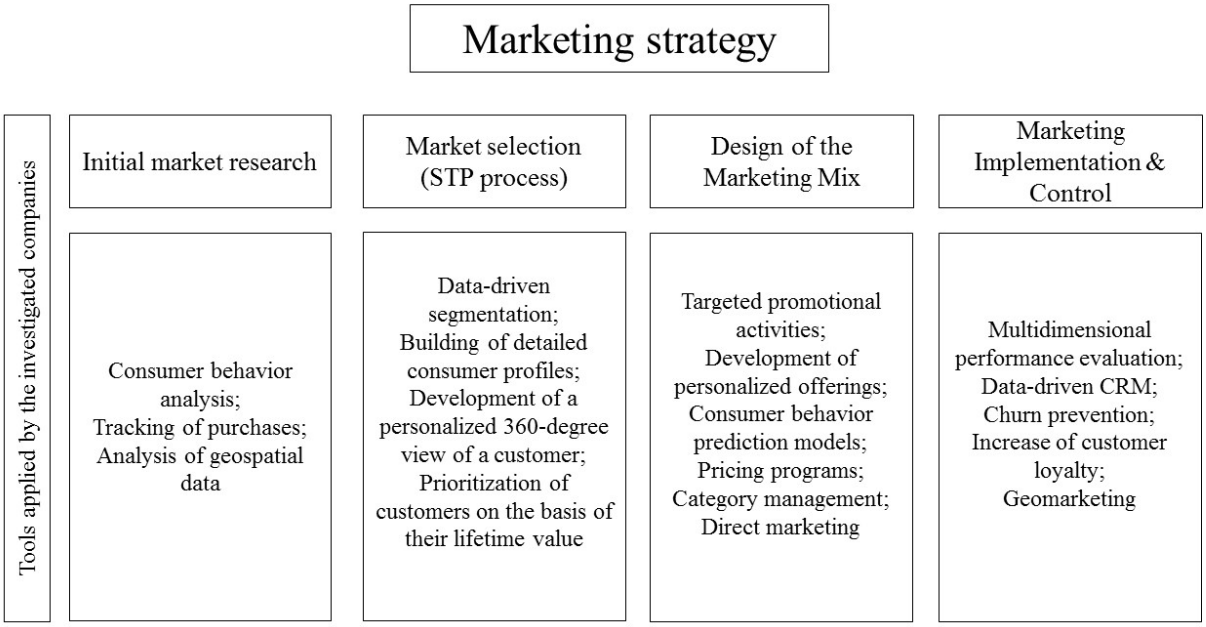


Fig. 4 Overview of marketing strategy tools applied by investigated companies

As it is seen from the table, the largest variety of applied data-driven marketing instruments belong to the planning stages of the marketing strategy: *market selection* and *design of the marketing mix*. Big data analytics are also frequently applied in the field of *marketing management and control* and sometimes for the purposes of *market research*.

In order to have a broader overview of marketing application of technology by selected organizations let us analyze each company case separately.

1. One of the major purposes of big data analysis at MTS Group is churn prevention and increase of customer loyalty. However, the company's representative shared with us his viewpoint that such things are very hard to be measured.

The current focus of the company on using big data for improving CRM systems performance was illustrated in the Cnews Analytics report (2013) which claimed that CRM applications of big data are the second most demanded category by Russian companies.

Let us analyze all marketing-based problems addressed with big data analysis at MTS Group. Generally speaking, all marketing applications of the technology can be classified as *customer base management* or *commercialization of the database*.

Segmentation programs form the basis for all further big data marketing applications and include *data-driven analysis of consumer behavior*, *tracking of customers purchases* and a few more things. With the help of segmentation on the basis of big data analysis MTS is able to improve effectiveness of the following marketing actions:

- Targeted advertising;
- Building a 360-degree customer view;

- Development of personalized service offerings
- Prioritization of customers based on analysis of their lifetime value and profitability;
- Up-sale and cross-sale initiatives.

In the opinion of the company's representative, the main goal of data-driven segmentation and targeting initiatives is to increase the volume of such performance indicator, as *average revenue per user* (ARPU).

The variety of marketing applications of big data analysis which MTS Group is currently using has been already illustrated by such authors as Feinleib, Arthur, Kash and Calhoun and prove the viewpoints of these researchers.

2. The second telecommunications market player is also affected by the industry trends, discussed earlier by the example of MTS Group. This company is still having a commercial focus on conventional mobile services, however the organization is also concerned about the importance of data transfer as a newly-emerged revenue source.

As a result, today the company is very much concerned with looking for alternative ways to increase sales, retain customers' loyalty and minimize churn rates. That is why marketing-related problems solved by big data analysis at the organization are above all centered on customer analytics, which proves the viewpoints demonstrated in the first chapter (Columbus, 2014, 2015; Datameer, 2014).

Big data analytics enable the organization to develop various segmentation and targeting programs and build advanced consumer profile models with consumer behavior prediction. Applications of findings from these segmentation initiatives are truly diverse.

The data-driven analysis allows the company, for example, to get a better understanding of the frequency of using different services provided by this operator, and decide on particular personalized offerings. If the company receives the information from data analysis that a client is not using conventional calls at all and mostly focuses on the Internet and text messages, the company sends him messages offering him to change to a new, more suitable and attractive tariff.

Targeted advertising is another marketing tactic which is based in the organization today on big data analysis. Marketing Director of the company shared the information how it really is executed in practice. For example, when company observes that a customer is located at the airport at the moment and his stay at the airport lasts more than 3 hours, the model assumes that this person is planning to travel abroad and suggests to send this customer a message with an offer to sign up for roaming options.

To sum up, marketing applications of big data analysis in the organization are centered on *increasing customer satisfaction* and making customers stay the organization in today's complex

for the telecommunications industry environment through personalized offerings and customized approach.

3. Let us have a closer look which purposes big data analysis serves at the Russian retail giant Lenta. During the interview three major technology application areas has been revealed: *customer loyalty increase, growth of sales volumes* and *operational efficiency increase*.

As it has been previously stated, the information from the Lenta's CRM system is one of the major data collection sources for the company. The information which customers have to fill in to get a loyalty card varies from conventional sociodemographic characteristics such as age and gender, contact information to such noteworthy customers' attributes as marital status and car ownership.

The company has started to issue loyalty cards for its customers back in 2000 and today more than 2,5 million people already possess across the country possess these cards. According to the available information, today the loyalty program of Lenta is one of the largest and most effective loyalty programs of the market, however the idea behind it does not differentiate significantly from any other loyalty program. All card owners get a 5% discount for all products assortment and up to 50% reductions for temporary special price offerings. It is important to mention the huge amount of active users of Lenta loyalty cards which accounted to 8,4 million people by the end of 2015. Besides, 92% of all purchases at Lenta are made with the help of these loyalty cards.

As a result, it is not surprising this *loyalty program* as a part of the customer relationships management has become the kernel of the big data analysis at Lenta, as it enables the retailer to get a deep understanding of its *customers' behavior, buying habits* and *preferences* and significantly upgrade existing *analytical customer behavioral models*.

The joint big data marketing project of Lenta executed together with the Emnos company, which was introduced earlier, is comprised of four major work streams which are targeted at increasing customer loyalty and sales volumes:

- *Pricing program to define* the best price levels for the whole assortment of products;
- *Lenta category management program* to improve management of different product categories of consumer baskets;
- *Direct marketing* to develop and customize promotional activities to customers' needs;
- *Emnos tools* to measure and evaluate performance of the data-driven marketing actions of the company.

The interview with the CRM Director has demonstrated that the *segmentation* forms a basis for big data marketing at Lenta. The major goal of this initiative is to *stop focusing on an average customer needs and develop a more sophisticated and personalized segmentation*

program. With the help of this technologically advanced segmentation platform Lenta has analyzed customers data, generated since 2012, segmented and prioritized them according to their relative attractiveness and profitability towards the company, their buying habits and purchase reasons and preferences. In order to assess profitability of a customer the *RFV approach* was applied which analyzes such indicators as *recentness, frequency and value of purchases.*

As a result, Lenta has identified 10 major segments and 2,5 million most attractive customers - loyalty cards holders. Besides, the company has adjusted merchandising strategy and modified products assortment on shelves in every single store of the chain.

It is also worth illustrating several segments that Lenta managed to identify with the help of big data analysis: *budget cooking* and *party people* segments. The retailer has revealed from the data possessed that there is a large share of customers who prefer to cook at home and who favor private brands of the retailer and on the other hand there is a huge segment of customers who just buy alcoholic beverages, refreshing drinks and various snacks.

Besides, the segmentation program has revealed two major shopping habits of its customers and analyzed profitability of these customer groups: while some customers of Lenta do shopping very frequently, but the value of their purchases is small, there is another large group of customers who buy products once a week, but spend on shopping significant sums of money. Although it has been analyzed by the company that profitability of these two segments is almost the same, this data-driven segmentation program enabled the retailer to *get a deeper understanding of needs and behavioral patterns* of these customers and *modify the marketing strategy for every store* (whether to focus on increasing average value of the check or frequency of purchases).

The pricing element of the data-driven marketing strategy at Lenta is concerned with *analysis of price sensitivity of customers* which allows the company to adjust current price levels for every single product of the overall available assortment across all regions, keep its positioning as a budget-priced retailer and therefore increase customer loyalty.

On the basis of the segmentation program Lenta has launched a direct marketing program of personalized offerings “Thank you mailing” for 2,5 million most attractive customers all over the country offering different customer segments customized coupons and discounts. The program is executed across several channels: post mailing, email mailing and SMS mailings. Regarding returns of the personalized recommendations, the response rate accounts for 4-6% which is considered as effective by the company.

Big data is used at Lenta also for the purposes of performance evaluation of various marketing actions, e.g. promotional activities.

4. Regarding big data as a marketing instrument, at Ulmart it is analyzed, above all, for the purposes of Marketing division, but also for resolving problems from Sales and Customer service departments.

Prevailing part of big data marketing at Ulmart is centered on developing *personalization* and *customization of the website* which is the single sales channel for the company and heart of the business. In order to achieve this, Ulmart puts a great emphasis on using big data for increasing effectiveness of *STP-processes* (segmentation, targeting, positioning). Thanks to the technology the company is able to identify and target many more segments of different size, relative attractiveness and other attributes that it used to. Integrated analysis of the streaming data along with *geomarketing* enable Ulmart to execute *customer profile identification* and develop a diversified, yet personalized marketing strategy which will target specific segments or customer profiles. In strategic marketing big data analysis helps Ulmart to do *scenario planning* across different customer segments and anticipate customers' behavior.

Another large group of marketing applications of big data at Ulmart is connected with *CRM system development.* The company's project on *development of recommendations system* is one of the most interesting examples of successful *targeting of identified micro-segments*. With the help of big data analysis of purchases across various product categories the company revealed a particular customer segment of "young parents" who buy baby diapers much more frequently than any other segments. As a result, the company designed personalized offerings for this segment and ended up with a 30% increase of the customer response rate, 2,3% increase of conversion rate and the tripled value of CTR (click-through-rate).

It is worth mentioning that targeting is executed by Ulmart with an integrated 360-degree view of customers which includes communication not only through the website design, but also through email targeting and all other channels of digital marketing.

Finally, Ulmart resorts to big data analysis for marketing actions' *performance evaluation*. On the regular basis the company evaluates effectiveness of promotional activities across different digital channels, analyzes customer searching journeys and as a result adjusts its actions.

In addition to the analysis of marketing-oriented big data projects, let us consider an example of successful big data application from Ulmart's *customer service division.* Several years ago Ulmart executed an initiative in Moscow "Delivery 2.0" which aimed at improving customer service in terms of product delivery and used big data as a basis for analysis. Ulmart revealed specific patterns and preferences of Moscow customers from its internal data and realized that the citizens of the Russian capital seek much more flexibility in delivery timeframes than any other customer segments across the country. As a result, Ulmart implemented changes

in delivery options and made them much more customized for the needs of Moscow citizens. The project paid off initial investments and persuaded the company to continue using big data analysis for boosting company's success.

The variety of marketing applications of the technology currently implemented by the online retailer has been already illustrated by such authors as Feinleib, Arthur, Kash and Calhoun and prove the viewpoints of these researchers.

Being in the online retail market for many years, the company feels quite comfortable with existing set of metrics, prevailing part of which belong to conventional digital marketing and web-analytics performance indicators. Among a wide number of KPI's used to assess big data projects the Manager emphasized the following indicators:

- *CTR ratio* (click-through-rate indicator, which is used for analyzing effectiveness of digital marketing actions and which demonstrates how many customers clicked on a particular link);
- *Conversion rate* (widely used digital marketing indicator which evaluates performance of marketing actions and shows how successfully these actions drove customers to make a payment);
- *Open rate* (used for email marketing, demonstrates how many customers have opened the sent email).

To sum up, it is noteworthy to refer to the theoretical review of the first chapter and demonstrate two types of marketing analytics which big data analysis is able to execute: *behavioral* and *transactional* analytics. The figure below shows which type of analytics investigated Russian companies tend to favor.

	MTS Group	**A major telecommunications company**	**Lenta**	**Ulmart.ru**
Behavioral analytics	Targeted advertising; Building a 360-degree customer view; Personalized service offerings; Prioritization of customers based on analysis of their lifetime value and profitability; Up-sale and cross-sale initiatives	Segmentation; Targeted advertising; Personalized service offerings; Consumer behavior prediction	Segmentation; Targeting; Consumer behavior prediction; Category management; Pricing programs; Direct marketing	Customization of the website; Geomarketing; Consumer behavior prediction; Targeting of micro-segments; Building a 360-degree customer view; Personalized service offerings
Transactional analytics	Not stated	Analysis of recommendation system effectiveness	Modification of marketing & pricing strategies; Assessment of category management & CRM initiatives	Effectiveness assessment of promotional activities

Fig.5 Marketing analytics executed by Russian companies as a part of big data marketing

The table demonstrates that there is evidence of Russian companies paying special attention towards behavioral analytics and derivation of insights about consumer behavior. Companies use big data analytics to execute a wide number of marketing processes while transactional analytics are applied to tackle particular issues.

Besides, Russian companies explore new areas in big data marketing and use equally *mature* analytical applications of big data marketing such as optimization of marketing campaigns, customer loyalty management, in-store custom analytics and *emerging* analytical applications has been currently implemented (ad targeting optimization, customer churn prevention).

3.1.6 Alternative applications of big data analysis

Empirical analysis has demonstrated that big data analytics is applied by Russian companies not only as a marketing tool, but also as an instrument to solve technical and infrastructural issues which indirectly help companies to be more customer-oriented and increase customer satisfaction.

1. Apart from pure marketing applications of big data analysis, MTS Group benefits from the technology while solving also *infrastructure-based problems*:

- *Optimization of infrastructure management at the company:* Today the company cannot afford to waste resources and that is why MTS has started to base decision-making of locations for building new basic stations on the traffic analytics of customers, while previously those decisions were taken without an analytical justification behind them.
- *Maximal utilization of traffic:* results of traffic analytics of customers allow the company to optimize the technical side of the traffic management.

According to the company's representative, both major groups of applications, customer-oriented and technical, are equally important since they reduce costs of the company.

2. Big part of big data analysis at another mobile services provider is also used for the resolving *technical issues*. The technology is used to decide on the number and locations of new basic stations. Vast amounts of geolocational data that the organization has at its disposal allows the company to understand the mobility flows as well as traffic usage of all sim card owners. As a result, it becomes much easier to optimize investment portfolio, plan construction initiatives and reduce technical problems in particular locations.

As telecommunications operators generate vast amounts of data, this information can be used not only for internal purposes. Geolocational information has released a new opportunity for the company to analyze locations of the network of clients and sell this data to third parties.

In 2013 the organization presented a project which was centered on using geolocational data for resolving traffic jams in Moscow and developing transport infrastructure. The full-scale geolocational project was initiated by the company already in 2013 and in 2015 the company started collaboration with a Russian transportation company and the project moved on to the testing stage.

Therefore, transportation companies, retailers or real estate companies may possibly reach the company for providing them detailed information about traffic of people, socio-demographic characteristics of these people, their purchasing power, purposes of travel, etc. As a result, big data analysis can play the role of not only internal growth driver, but also as an external source of generating higher sales volumes by diversifying the business and offering new services.

3. As for the examples from other industries, once Ulmart analyzed the influence of Javascript errors (when customers experienced technical problems searching for a product at Ulmart online) on the overall conversion rate and revealed a strong relationship between these two indicators.

3.1.7 Effectiveness of data-driven marketing practices

Regarding analysis of effectiveness of data-driven marketing practices, opinions of explored companies differ and provide different perspectives.

1. For instance, the Manager of the MTS Group shared his viewpoint that MTS does not see real value addition of big data analysis. In his opinion, in case of a telecommunications company big data is more of a “media fuss” rather than a real phenomenon. Big data analytics do not actually bring substantial profits to the company, although there are some records of successful initiatives.

However, the literature review has demonstrated (CIO online journal, 2014) that companies should not expect quick financial returns from the implementation of the big data technology, instead it is recommended to focus on long-term benefits of this technology and keep patience.

2. The interview with the Marketing director of the second telecommunications company has demonstrated that the gains are seen, above all, in investment portfolio optimization programs. Due to the smart and data-driven analysis the organization opened 10 times more stores and 100

times more basic stations across the country. As for marketing, returns have been gained due to the targeted advertising and personalized offerings campaigns.

3. Regarding Ulmart, in an interview with Cnews in 2014 former Client analytics Manager of Nikolai Valiotti stated the strategic importance of using data analysis which was totally supported at the corporate level. He also ensured that particularly *big data* is one of the directions to drive the company's future growth.

Besides, Valiotti shared the information about the company's improved market performance, which was achieved due to the data-driven strategy, and expressed Ulmart's huge interest in investing in big data technologies for the upcoming years (the budget of the business analytics department increased by 3 times in 2014-2013).

From the Ulmart's perspective rewards from big data analysis generally outpay initial investments. Gains and real benefits are especially seen in the big-data-driven redevelopment of recommendation systems (e.g. the one, which targeted young parents buying baby diapers) when Ulmart conducted a deep analysis of customers' behavior on the website and derived meaningful insights. In terms of performance evaluation of marketing data-driven actions, such KPI's as *open rate* and *click-through-rate* have improved much more than others.

Therefore, we can conclude that Ulmart is determined to benefit from this new promising technology, which is demonstrated by the top management's interest expressed in mass media. Yet it is important to keep in mind that the Russian largest online retailer has always been putting an emphasis on business analytics and particularly web-analytics. That is why at the middle level of the organization big data analysis initiatives are unlikely to be considered as a major technological shift in Ulmart's practices.

3.1.8 Major market trends and obstacles of big data analysis as a marketing instrument

Execution of big data analysis for marketing purposes is connected with a number of obstacles which Russian companies are trying to overcome. Let us illustrate the most important of them for every company.

1. Regarding the obstacles which MTS is facing, they include the following barriers:
   - *Evolving area of big data technology,* and MTS has to learn from its own mistakes;
   - *Regulatory risks* based on privacy legislation in Russia (however, these issues are extremely strictly regulated inside the organization in order to prevent leak of data);
   - *Lack of relevant metrics and measurement instruments.*

Investments into new technology are not seen as a barrier by MTS since it already has an existing team of BD professional and relevant installed equipment which contradicts the viewpoints expressed in publications from Cnews Analytics and Oracle (2014).

The manager of the company also demonstrated how the company considers the influence of current market situation on the Group's using big data analysis in marketing:

- Economic crisis triggers companies to search for new ways for costs reduction and big data analysis has a lot to offer here;
- As discussed, there is a slow-down trend in the telecom industry, since the voice as an asset has dramatically lost its value over the recent years, and telecom companies have to look out for alternatives;
- Business community is generally becoming more tech-savvy and more knowledgeable about technology and the power of data - that is where telecommunications companies have a lot to offer in terms of their analytical capabilities.

2. There are several significant barriers which do not allow another Russian telecommunications company to realize the full value of technology adoption. In the company's representative opinion, the main problem is connected with the *lack of competent data science professionals*. As several other Russian companies, with the emergence of big data analytics as one of the major growth drivers for business the organization went with the flow and started to adopt this technology in the organization by internal development of models based on big data analysis.

This decision of the company reflects the results of the analysis by Cnews Analytics (2014) which has revealed that Russian companies not only resort to external providers of big data analysis, but also develop their own models and capabilities in this area.

However, the *insufficient level of market development* and *lack of relevant instruments* obstruct further execution of the technology. Finally, *strict privacy legislation* in Russia is one of the major obstacles with regards to using big data analysis and especially selling the data to the third parties, and that is why the company is very concerned with ensuring the privacy of customers' personal data. As a result, all these factors lead to the situation when the company develops its own models for using big data analytics instead of resorting to external vendors.

Concerning future plans of the company and willingness to invest in technology and innovation, the Marketing Director shared with us that there is a number of alternative innovative tools in marketing which the company is also ready to invest in. These alternatives include, above all, investments in *mobile TV streaming* and *development of mobile commerce* and reflect current market trends of the telecommunications industry.

3. Taking into account the retail sector and the Ulmart company, there is a number of challenges which the company is trying to overcome. First of all, marketers at the company face difficulties at the initial stage of research: *revealing and describing a problem* as well as deciding what kind of data is necessary for a particular problem. Variety of information sources often make marketers feel frustrated and lost in the thousands of customer characteristics, structured and unstructured, quantitative and qualitative.

Another barrier is connected with the early stage of technology adoption by the company and the emergence of this market in general. In the opinion of the Ulmart's Client analytics Manager, "it will take quite some time to understand the real benefits of big data analysis and exactly the same happened with the emergence of Internet technology".

Finally, concerning the competences of the human resources for analysing big data, the company does not see this as a major problem. Ulmart confirms that there is generally lack of competent data scientists in the market, but on the other hand the company is investing a lot in education and training of its own employees. For example, Ulmart is hiring recent graduates from relevant studies (Higher School of Economics, Moscow, Business Informatics Faculty; Saint Petersburg State University, Faculty of Economics, Business Informatics program) and trains them to become professionals at big data analysis and interpretation.

All in all, the majority of problems which Russian companies are trying to overcome have been demonstrated in the publications dedicated both to global market trends as well as peculiarities of the Russian market (Oracle, 2014; Cnews Analytics report, 2014; McKinsey Global Institute, 2011; Minelli, Chambers, Dhiraj, 2013; Dietrich, Plachy, Norton, 2014).

3.1.9 The role of alternative innovative business solutions

The empirical research has demonstrated that the importance of big data marketing is planned to remain at the high level as it is at the moment, however there is no doubt that the investigated companies are considering investments also in other innovative solutions for their businesses. Let us provide several examples of how companies consider future opportunities for big data analytics and other innovations if there are any.

1. From the perspective of MTS, future opportunities of using big data are truly diverse:

- Further development of *mobile commerce* (there are some steps made by the company, however legislation factor puts limitations on further commercialization of the technology);
- The long-term future goal defined as "*selling ultra-personalized services and analytics for the mass market*": providing services for third-parties: market analyses, targeted

advertising, variety of ready-to-use analytical data across customer segments and different characteristics from the MTS's analyzed databases;

- *Building partnerships* with other companies with top-quality services or any other competitive advantages and creation of synergy (collaboration with banks (credibility of customers), Uber or Yandex as potential examples);
- *Improvements in service quality:* the example of the joint project with Yandex Maps enabling customers with Android smartphones to share their comments about connection quality across different locations which MTS Group is processing.
- Internet of things is also driving big data development;
- MTS is thinking about selling to B2B and B2G clients ready-to-use analytics on the basis of databases which the company possesses.

2. As for the future plans of using big data analysis for marketing purposes at Ulmart, there is a focus on the following initiatives:

- The company is currently testing the model of attribution of revenues achieved by various digital advertising actions. Digital advertising strategy of Ulmart is executed across different channels, platforms and marketing intermediaries and therefore the company wants to be clear about which advertising actions bring customers to the website most successfully.
- CRM system of Ulmart will continue to use big data analytics for further development and particularly for aggregation of loyalty programs;
- Development of personalization programs which will be based on deep analysis of customer profiles and behavior patterns;
- Integration of offerings across different search devices (personal computers, smartphones, tablets, etc.) in order to gain a deeper understanding of the customers and optimize marketing actions. One of the triggers of this initiative was the company's recent analysis of the number of new customers which demonstrated that a major part of them were the same individuals who used different means for searching.
- Implementation of Tableau software for data visualization which will enable marketers of Ulmart to easen analysis of big data.

However, it is important to say that big data technology is not the only innovation driver for Ulmart. The company positions itself as a strong leader in Russia's e-commerce business and considers a number of innovative technology-driven initiatives. Recently the company presented a full-scale project at MIPIM (the world's leading conference on the property market) dedicated to the development of the e-commerce base which will unite and optimize logistics of all

physical outlets of the company.[16] Moreover. the company is considering such opportunities as development of mobile services and an idea to become the national centralized cyber-marketplace (the so-called "Russian Alibaba" project triggered by the Russian government) which will enable Russian companies to export their products via this channel.[17]

Although there are some other innovative projects that Ulmart is planning to execute, big data analysis remains to stay very important for the company's development.

3.2 Key findings of the empirical research

3.2.1 General overview of results

In this part of the study key conclusions of the findings from theoretical as well as empirical research are converged and key factors and dimensions of specifics of big data analysis as a marketing tool by Russian companies are illustrated. Besides, special attention is paid to the critical comparative analysis of practices of Russian and foreign companies across identified characteristics.

The brief overview of differences in technology implementation by the investigated Russian companies is demonstrated in a table below.

Table 6 Comparison of big data marketing practices of four Russian companies

Name of the company	**MTS Group**	**A major Russian telecommunications company**	**Lenta**	**Ulmart**
Industry	Telecommunications	Telecommunications	Food retail	Online retail
Amount of data generated by the company	Extremely large (77,3 million subscribers)	Extremely large (74,8 million subscribers)	Extremely large (8,5 million active loyalty cards users)	Extremely large (1,5 billion active users)
Technology adoption	2013-2014	2014	2013	2014
Big data marketing as a part of the organizational structure	CRM department of the Marketing division	Marketing & Sales Departments	CRM department of the Marketing division	Marketing and Advertising office, Strategic analysis and scenario planning department
Types of data used for big data marketing	Customer locations and customer journeys; billings information; multi-dimensional data on consumption of mobile services, text messages, etc.; content of the text messages;		Purchasing history, checks; recentness, frequency	Purchasing history; time used for searching;

16 ATI-Media.Ulmart will demonstrate a new project in Cannes at MIPIM. (2016). From:http://ati.su/Media/News.aspx?ID=84424&HeadingID=13

17 Rosbusinessconsulting. Ulmart will follow the Alibaba's way. (2015). From:http://www.rbc.ru/business/24/06/2015/558976a89a7947333e5f2f5a

	information about recipients of calls and text messages; multi-dimensional information about the internet traffic and data consumption.		and value of purchases	type of device for searching; customer preferences; frequency of using the website; sociodemographic data of customers
Marketing applications of technology	CRM; commercialization of the database; segmentation; analysis of consumer behavior; prioritization of customers based on analysis of their lifetime value and profitability; development of the 360-degree customer view	Segmentation and targeting programs; consumer behavior prediction; churn prevention and retention of customer loyalty	Segmentation, targeting; customer loyalty increase; CRM, pricing programs, category management, direct marketing; performance evaluation	Segmentation; targeting; personalization and customization of the website; CRM; development of the 360-degree customer view; performance evaluation
Other applications of technology	Optimization of infrastructure management at the company; Maximal utilization of traffic	Optimization of investment portfolio	-	Reduction of technical errors
Effectiveness of big data analysis in marketing	Not yet significantly effective	Yes, personalized recommendations systems	Yes, CRM and personalized offerings	Yes, personalized recommendations systems
Barriers	Evolving area of big data technology; regulatory risks; Lack of relevant metrics and measurement instruments	Lack of competent human resources; insufficient level of market development; lack of relevant instrument; privacy legislation	Lack of competent human resources; insufficient level of market development	Revealing and describing a problem; Insufficient level of market development
Future development of big data marketing	Ultra-personalized services and analytics for the third parties; improvements in service quality	Upscaling and expansion of current big data marketing practices	Upscaling and expansion of current big data marketing practices	Model of attribution of revenues achieved by various digital advertising actions; aggregation of loyalty programs; integration of offerings across different search device; implementation of Tableau

				software
Future plans to invest in other innovative business solutions	Internet of things; mobile commerce	Mobile TV streaming; development of mobile commerce	-	Development of mobile services; optimization of logistics

The table demonstrates the summary of all aspects of big data marketing practices of investigated Russian companies which have been addressed during the empirical part of the research. Let us outline major findings from each aspect of technology execution.

3.2.2 Country-specific level of market development and technology adoption

While today the share of foreign companies which already use big data analysis in their business accounts for approximately 30% of all business entities, less than 10% of Russian companies in fact use this technology.

Moreover, the majority of the Russian companies which exploit big data analysis are represented by *the large market players* - market leaders among telecommunications companies (Vympelkom, Megafon, MTS Group), a number of national retailers (Ulmart, Lenta, X5 Retail Group, Gloria Jeans) as well as banks (VTB24, Alpha Bank, Sberbank) and government institutions (Federal tax authorities).

According to statistics, only 10% of 108 large Russian organizations in fact use extensively big data analysis in their operations (CNews Analytics; Oracle, 2014).

The multiple case study analysis of 4 Russian companies has demonstrated that there is a number of reasons which explain the current state of technology adoption by Russian companies.

First of all, the rapid growth of big data market as well as technology adoption started for foreign companies 5-7 years ago which was relatively earlier than for Russian organizations. According to the study's findings, Russian business resorted to big data analysis only 2-4 years ago.

Therefore, foreign companies have had more time to master big data execution at their organizations and benefit from the higher stage of market development, while Russian companies remain pioneers in this field. The have just started to build and leverage capabilities, which is a very time- and resources-consuming process with no quick financial returns.

However, it is necessary to mention that although technology adoption levels may vary across countries, *the global big data market still remains at the relatively early stage of development*.

3.2.3 Financial resources for technology execution

Secondly, since investments in a new technology are always connected with *heavy financial implications*, it is not surprising that only large Russian market players with substantial financial resources can afford investing in execution of big data analysis.

However, big data analysis at an organization can be executed in two different ways with different amount of investments required. An organization can start *collaboration with an external vendor* of data analytics, a competent IT company, which will provide a client on a regular basis with ready-to-use analytics. This outsourcing approach requires much less financial investments and internal organizational changes than another alternative which is based on *building internal capabilities of big data analysis* and developing a complicated comprehensive data strategy for the whole organization.

The empirical part of the research has demonstrated that Russian companies tend to favor the first, faster and less expensive approach to big data analysis which allows them to benefit faster from technology adoption and jump over *the difficulties of implementation of an internal organizational change*.

Three out of four analyzed companies have decided to implement internal changes only in human resources management, hiring data scientists and architects and training and educating existing Marketing and CRM managers to upgrade their analytical capabilities, and leave technology development to external vendors. Yet one telecommunications company, studied during the research, in addition to the education of employees is trying to achieve the goal of building internal technological knowledge of big data analysis and does not want to rely on third-party suppliers of the big data platforms.

As a result, it can be concluded that although financial resources play an important role for a Russian company in deciding whether to resort to big data analysis, the relative strength of this factor may vary since companies face different options.

Thirdly, empirical research has demonstrated the paramount importance of such industry-specific factor as *existence of massive data sets at an organization* large enough to be analyzed with big-data-based platforms. During the theoretical literature review the industries with the highest technology adoption level have been revealed which are the same for Russia and the global market: financial services, IT services, telecommunications, retail and healthcare.

These industries share one characteristic, crucial for understanding the problem investigated in this study, - they all have historically been having extremely large amounts of data about their customers at their disposal, analysis of which can tackle a wide number of business-related issues and above all, marketing-based problems.

Empirical research of four Russian companies has proved the real-life importance of this factor: today Russian organizations solely from the several identified economic sectors are in fact using big data analysis in their business operations. If to take an example of the telecommunications and retail industries, which the investigated companies belong to, they all have been always generating large amounts of data: purchases history, geolocational data, information from the loyalty cards, usage of Internet traffic, distribution of usage of different mobile services, sociodemographic data, etc. Unsurprisingly the emergence of a new technology was perceived by these companies as a way to increase effectiveness of the existing managerial practices.

3.2.4 External environment

Finally, when discussing the reasons for technology adoption by Russian companies it is also important to consider *external triggers* such as *macroeconomic environment* or *industry-specific economic environment*.

Multiple case study analysis has broadened the overview of market trends discussed in the first chapter and demonstrated some other external reasons for adopting big data analysis in marketing by Russian companies.

Today Russian economy is at the stage of a deep and continuous recession and that is why companies are looking for all sorts of alternatives to reduce costs, increase efficiency and obtain currently extremely price-sensitive Russian consumers. The investigated companies confirmed that marketing applications of big data analysis enable them to stay competitive by enhancing customer-orientation.

In addition, let us consider the impact of industry-specific economic environment on technology adoption. For example, the empirical research has demonstrated that telecommunications companies are particularly interested in big data analysis as a marketing tool because of the variety of options and its capabilities to overcome current industry challenges, reduce churn rates and increase customer loyalty via personalized offerings and discounts.

As a result, it can be concluded that any external environment, whether it is country-, industry- or company-specific, may have a significant influence on adoption of big data analytics as a marketing instrument.

3.2.5 Organizational structure and data management

Let us discuss the role of big data marketing in frames of the organizational structure of Russian companies and analyze the changes in internal business processes followed after the adoption of this innovative technological tool for marketing purposes.

The analysis of multiple cases has revealed the fact that none of the investigated companies has yet gone through a major internal transformation after organizations started to use big data analysis. As it has been previously discussed, Russian companies tend to prefer collaboration with external vendors and therefore the major challenge in using technology is mostly connected with human resources management and hiring truly competent data scientists and architects.

As it has been previously stated, big data analysis at Russian companies is applied mostly for solving marketing-related problems and that is why the execution of technology as a rule takes place in *Marketing* and *CRM departments* of organizations and sometimes in *Business intelligence department* if there is any.

None of the organizations have yet decided to build a comprehensive data strategy at their organization to develop data management across all internal organizational units. In most of the cases Russian companies have just recently started to use the technology and they are still at the stage of testing effectiveness of big data analytics.

As it was discussed in the theoretical chapter (Arthur, 2013), the lack of the data enterprise strategy is a very common practice among companies who have already started to use big data analysis, but have not yet understood the importance of building a long-term data management strategy. These results are not surprising, because such a decision requires resources to bear substantial financial implications and high interest and dedication from top management to overcome the challenges of managing an internal organizational change.

The case of a major French telecommunications company SFR, illustrated in the first chapter, demonstrates the benefits of development of data strategy for the whole organization which enabled SFR to store and analyze data about the customers and derive valuable insights on a regular basis and improve significantly data warehouse performance.

3.2.6 Organizational competences of data management

It is also crucial to emphasize the impact of such factor as *the existence of organizational competences* to analyze and derive valuable insights out of this data. Empirical research has demonstrated that there is a major difference in considering big data analysis among companies which already have existing practices of conducting business analytics on a regular basis and among those who have never paid a lot of attention towards analysis of data generated by the company.

For example, for Ulmart, which is a pure e-commerce player, data analysis and business analytics have always played a crucial role as the company deals with loads of transactional data on a daily basis. From the very beginning of the business Ulmart already had experienced

employees in the Marketing division to execute web analytics and developed a system of necessary performance metrics.

The emergence of new opportunities triggered by big data analysis was quickly adopted by the company with several minor organizational changes and is now been implemented across several business processes and, above all, in marketing. Therefore, the process of technology adoption was rather easy for Ulmart: the company just hired a few more competent employees and extended the personnel of the Strategic analysis and Scenario planning department which belongs to the Marketing and Advertising office.

As for MTS Group, the company has started working with data quite a while ago - as a part of database management and business analytics. Although MTS has hired a new team of IT professionals to build analytical models and work closely with big data, the organizational structure of the company hasn't changed much after the company officially started to analyze big data. Big data is being handled solely by the company's technology experts in CRM department of the Marketing division and there are no other employees involved in big data analytics outside of the Marketing division.

Another telecommunications company executes big data analysis in Marketing department while Lenta applies big data analysis inside CRM department of the Marketing division.

To sum up, during the case study analysis it has also been revealed *the lack of understanding of big data analysis as a new technology* by Russian companies as a result of *unclarity of definitions of big data analysis* and innovativeness of the topic. Not only the researchers are facing difficulties in defining big data, as it has been demonstrated in the theoretical chapter, but also business practitioners. It is often complicated for the companies to define their current practices from marketing, CRM or business analytics departments on the basis whether they belong to big data analysis or not.

Nevertheless, all investigated companies agreed on *the existence of a new perspective on business and marketing analytics* which big data analysis provides and confirmed *the emergence of new sophisticated technological tools* which scale up existing data management practices to a much higher level of development.

3.2.7 Application areas of big data marketing

This study focuses specifically on big data analysis as a marketing tool, and importance of the big-data-driven marketing instruments is supported by the findings from the theoretical and practical literature review. According to statistics, 48% of big data analysis applications belong to customer-related problems which includes churn reduction, product improvement

initiatives, increase of customer acquisition and revenue per customer and some more things, and 10% of them are used for new product and service innovation solutions which contain data-driven development of new products and service offerings (Datameer, 2014).

As for the specifics of the Russian market, marketing problems are also one of the top issues which are addressed by Russian business leaders by the means of the new technology. Big data analysis is generally used for advanced customer analytics, segmentation, targeted advertising and performance evaluation. The prevailing share of biggest big data projects among Russian companies (90%) were initiated to solve marketing-related problems among others (Cnews Analytics, 2014).

Analysis of multiple cases of Russian companies has proved the findings from the theory and provided a detailed illustration of application areas of big data analysis as a marketing instrument.

Despite the fact that the analyzed companies belong to different economic sectors (telecommunications, bricks-and-mortar food retail and online retail), all of them emphasized the paramount importance of data-driven *customer analytics* with *segmentation program* as the kernel of it. A thorough segmentation forms a basis for further big data marketing strategy and provides an organization with a plenty of valuable insights about its customers.

As long as a company develops a personalized 360-degree view of a customer, gets a full and comprehensive understanding of its customers across the variety of characteristics, it can move on with further development of such data-driven marketing actions, as prioritization of the most profitable segments, targeted pricing and CRM initiatives, targeted advertising campaigns and many more marketing tactics.

Besides, all investigated Russian companies use technology for *customer relationships management* initiatives as a way to, for example, increase customer loyalty and reduce churn rates.

Russian companies are trying to stay competitive in today's market of very price sensitive consumers with decreased purchasing power and that is why they mostly resort to customer analytics applications of big data as a marketing instrument. The goal is *to increase personalization of marketing actions* and provide every single customer with exactly what he needs.

Moreover, big data marketing executed by Russian companies is not limited by customer analytics, but also includes opportunities to *evaluate performance of offline and online marketing actions* on a real-time basis and receive detailed information and valuable insights across any segments, individuals or marketing actions.

Russian companies explore new areas in big data marketing and use equally *mature* analytical applications of big data marketing such as optimization of marketing campaigns, customer loyalty management, in-store custom analytics and *emerging* analytical applications has been currently implemented (ad targeting optimization, customer churn prevention).

Finally, empirical research has demonstrated that it is important that big data analysis solves marketing problems not only directly, but also *indirectly* as a consequential effect of data-driven technical (infrastructural) applications of technology. Sometimes Russian companies resort to big data analysis in order to optimize the technical side of the process and as a result become more *customer-oriented* and achieve positive commercial results.

3.2.8 Effectiveness of big-data-driven marketing

One of the most interesting perspectives of this study was to analyze whether big data marketing can be a truly effective tool and bring profits. One of the main research gaps identified during the literature review was that opportunities and potential gains of big data analysis for business are well illustrated in today's theoretical literature as well as in publications prepared by practitioners, yet they mostly represent positive attitude towards technology implementation and are rarely based on full-scale real-life case studies. Empirical part of the research provided a broader perspective of the problem.

The MTS Group was quite sceptical about the current gains of big data analysis as a marketing tool for the organization, although it confirmed a few successful initiatives. The reasons for this viewpoint were the following. On the one hand, MTS has already been doing similar marketing analytics as a part of database management and as a result the company does not see usage of new algorithms today as a major technological shift. On the other hand, big data marketing at MTS Group as a combination of newly hired competent employees and application of new sophisticated mathematical models simply does not yet bring substantial financial returns.

However, the other three out of four investigated companies confirmed effectiveness of big data technology for marketing. Another Russian telecommunications giant has achieved positive commercial results with the help of data-driven *targeted advertising* and *personalized offerings campaigns*. Besides, this company put a special emphasis on the effectiveness of big data analysis in *investment portfolio optimization* where advanced analytics enabled the company to optimize significantly the launch of new basic stations.

As for the analyzed retail market players, Ulmart sees the real benefits of big data analysis in *personalized recommendation initiatives* while Lenta confirms commercial success of *segmentation programs* and data-driven *CRM practices*.

As a result, it becomes clear that although not every big data initiative brings substantial financial returns, data-driven segmentation together with development of a 360-degree view of a customer form a basis for successful big data marketing. After the most profitable segments are identified and detailed customer profiles are built, marketers can develop targeted marketing campaigns and implement personalized recommendations initiatives to give the customers exactly what they need.

3.2.9 Major challenges in big data marketing execution

The review of the relevant theory followed by the empirical research has demonstrated a very high similarity between the challenges illustrated by researchers and those mentioned by the analyzed Russian companies. Besides, it is important to mention that a big number of identified barriers attributable to the global market of big data are relevant also for the Russian market. Let us illustrate all the barriers of implementation of big data analysis as a marketing instrument.

First of all, all representatives of the Russian companies which participated in the interviews consider the *insufficient level of market development* as a major obstacle which leads to all other barriers. Since the phenomenon of big data analysis and the variety of its marketing applications has gained attention of the Russian business community only several years ago, the specifics of technology execution remain unexplored. Currently there are no best practices of using big data as a marketing tool, neither by foreign companies, nor by Russian organizations.

As a result, Russian companies have to deal with the *shortage of competent human resources* which is regarded as the second most significant barrier in technology usage. Russian companies, as well as foreign organizations, are experiencing the shortage of not only the technical and IT professionals of big data analysis, but also lack of advanced analytical competences and necessary educational background of current Marketing managers.

However, this problem is very likely to be resolved in the nearest future, since several well-respected Russian universities and schools of Russian IT companies (Higher School of Economics in Moscow, Yandex School of Data Analysis or Saint Petersburg State University) have recently developed programs dedicated specifically to preparing future experts in data science, machine learning and IT in business.

Thirdly, Russian companies are often facing the *lack of developed metrics and instruments* to derive valuable insights out of big data. However, organizations which already apply extensively database management or business intelligence practices are less dependent on this factor than other companies who have to start working with data from scratch.

3.2.10 Future interest in big data marketing and the role of other innovations

All Russian organizations, which have participated in the empirical part of the study, have confirmed the future interest in big data analysis as an attractive technology for solving various marketing problems. Special attention is paid towards further development of personalized recommendation programs as a part of CRM practices which is generally considered by Russian companies as the most effective data-driven marketing tool.

There is no doubt that these companies are considering investments also in other innovative solutions for their businesses (e.g. Internet of things, video streaming, etc.), but the empirical research has demonstrated that the importance of big data marketing is planned to remain at the high level as it is at the moment.

3.3 Managerial implications of the study

Due to the innovativeness of the topic and early stage of big data market development the process of implementation of big data analysis for marketing purposes may become a very challenging initiative for an organization. That is why companies are recommended to pay special attention to the following aspects. An overview of them is illustrated in the figure below.

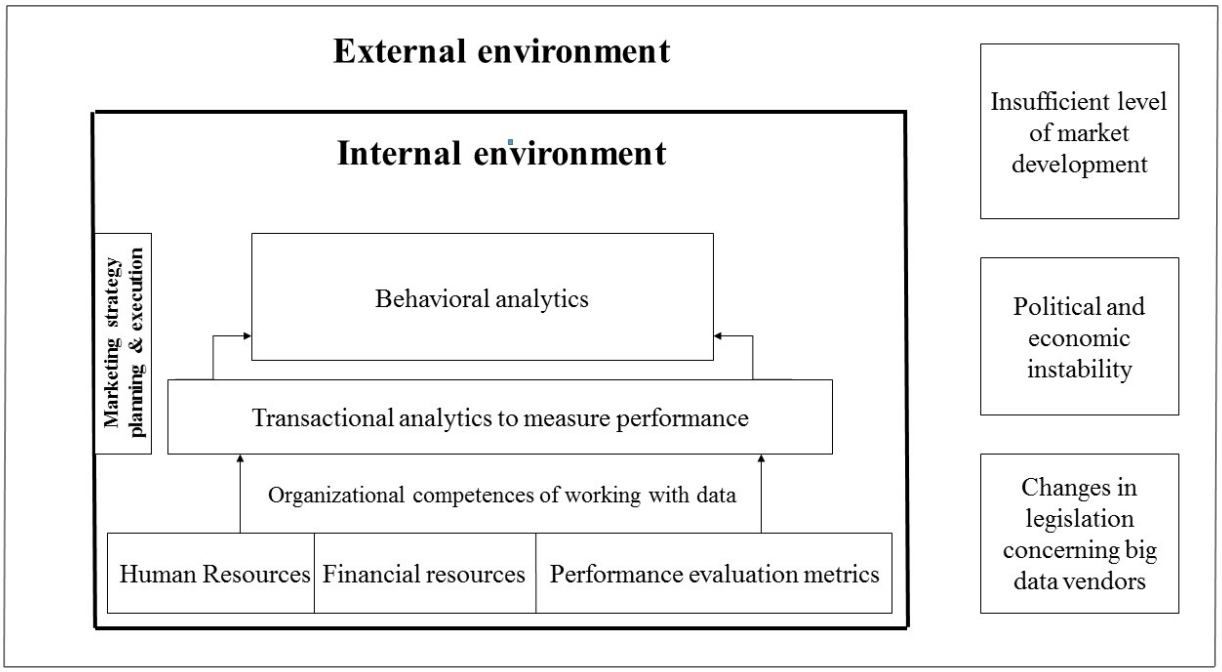


Fig.6 Overview of factors which impact execution of big data analytics for marketing purposes

The figure demonstrates that all factors which impact big data marketing practices of Russian companies can be clustered into two large groups: external and internal environment. Let us point out the most important aspect from each group.

External factors

In order to succeed in using big data analytics as a marketing tool it is crucial to understand the impact of external environment on implementation of technology by an organization. As it has been many times mentioned in this study, at the moment the major obstacle of successful implementation of big data marketing is *insufficient level of market development* which affects the overall process of technology adoption and usage. It becomes much easier to overcome this challenge as long as Russian companies start building competences and applying big data analytics.

With regards to *big data vendors* as major suppliers of technology, Russian businesses will not face a shortage of them: Russian market of big data is comprised of a large number of both foreign (IBM, Oracle, SAS, Microsoft, SAP, Pivotal, Cloudera, Qlik) and Russian market players (Yandex Data Factory, Mail.ru Group), different in terms of the size of a company, core competences, price segments and services provided.

Russian companies are also recommended to be concerned with the overall *instability* in the political and economic situation and pay attention to the external environment changes. For example, it is useful to take into consideration *possible changes in legislation* such as limitations on purchasing software of foreign IT suppliers by Russian companies which is aimed at development of a secure and independent national IT system. As a result, Russian companies should anticipate future consequences of these external changes to minimize the risks connected with big data analysis execution.

Internal factors

From all internal factors above all success in implementation of big data analysis for marketing purposes depends on the importance of *data management* at an organization and whether a company already applies extensively methods of business analytics and business intelligence in their business operations and pays special attention to database and customer relations management inside Marketing division.

Organizational competences of processing and analyzing data, which include among others existing expertise of employees and an effective system of managerial control, have a great positive impact on potential effectiveness of technology adoption and minimize the costs.

Russian companies are often facing the *lack of developed performance evaluation metrics and instruments* to derive valuable insights out of big data. However, organizations which already apply extensively database management or business intelligence practices are less dependent on this factor than other companies who have to start working with data from scratch.

That is why, for example, companies from the e-commerce sector or offline businesses where customer analytics play a significant role in marketing decision-making process adopt the

technology for marketing purposes much quicker than other companies taking advantage of existing competences.

The *shortage of competent human resources* to work with big data analytics in the labor market can be also resolved if a company has established competences in the field of business analytics and data management. Education of data scientists and architects, as well training of data-savvy Marketing managers, takes a lot of time and does not bring quick results.

Therefore, it is recommended to consider in advance possible opportunities and envision potential obstacles connected with hiring competent data scientists and educating existing managers who will have to work with large data sets on a daily basis before investing in a promising technology. A good suggestion would be also to *build partnerships with Russian universities* such as Higher School of Economics in Moscow, Yandex School of Data Analysis or Saint Petersburg State University which have recently developed programs dedicated specifically to preparing future experts in data science, machine learning and IT in business. Companies should develop employer branding programs targeted at the students of these programs and attract young talents to work for their businesses later on.

Besides, big data marketing requires *financial resources* to adopt and implement technology, which is another aspect which Russian companies should pay attention to, however organizations have another less resources-consuming alternative at their disposal. *Collaboration with external vendors* will resolve the problem for any business and will require the client company just to hire several data science professionals and train Marketing managers to work with advanced, dynamically changing analytics provided by the suppliers.

To sum up, big data marketing is more likely to bring commercial success to the company if it develops *a long-term comprehensive data management strategy* for the whole organization. It will provide a basis for a secure regular flow of data across organizational units, develop a system of data generation, processing, analysis and storage. When big data analysis gains attention of not only Marketing department, where it is most frequently applied, but also the whole organization, its effectiveness is much more likely to increase and bring bigger benefits.

Effective application of different big data marketing tools

Analysis of the variety of marketing applications of big data analytics by foreign and Russian companies has demonstrated that it is the most rational and effective decision to base big data marketing strategy on *behavioral analytics* which provide Marketers of an organization with a variety of useful instruments to optimize almost every process across the marketing strategy.

Segmentation and development of *personalized 360-degree view of a customer* should form the kernel of behavioral data-driven analytics part of the marketing strategy. As long as a company gets a full and comprehensive understanding of its customers, it can move on with

further development of such data-driven marketing actions, as prioritization of the most profitable segments, targeted CRM initiatives and targeted advertising campaigns and many more marketing tactics.

Besides, data-driven marketing strategy of a company should definitely contain a special emphasis on *personalized recommendations programs* as a part of data-driven customer relationships management, which have proved to be the most effective instrument of big data marketing currently applied by Russian companies.

Moreover, Russian companies should keep in mind that big data marketing is not limited by behavioral analytics, but also includes opportunities to *evaluate performance of offline and online marketing actions* on a real-time basis and receive detailed information and valuable insights across any segments, individuals or marketing actions. One of the biggest advantages of big data marketing is the freedom and flexibility which marketers have in terms of performance evaluation, since they can test and analyze almost all information at their disposal, including unstructured data.

In addition, it is recommended to consider *technical and infrastructural applications of big data analysis* and their indirect positive influence on such indicators as customer satisfaction and loyalty which are commonly measured by marketers.

3.4 Limitations of the study and discussion of further research

The main limitation of this research is based on the innovativeness of big data analysis as a marketing tool. Currently there are no best practices in the global as well as Russian market, the phenomenon remains underinvestigated by researchers and business practitioners.

One of the limitations is connected with the insufficient time of using this technology by Russian companies as a result of the innovativeness of big data marketing and early stage of market development. In order to increase the reliability of empirical findings and provide a deeper analysis of the problem ideally Russian companies should already have a minimum 8-10 years record of applying big data techniques in marketing while in reality technology was adopted approximately 2-3 years ago.

It is also noteworthy that the empirical part of the study takes into consideration Russian companies from only two industries, telecommunications, online and offline retail, yet they in fact belong to the currently small number of Russian economic sectors where big data marketing is in fact applied.

For the further research it is recommended to broaden the perspective of empirical analysis, increase the variety of industries for investigation and include case studies of Russian companies from banking industry and government institutions.

Besides, another interesting perspective of the future research could be to conduct empirical analysis of practices of Russian big data vendors - such companies as Yandex Data Factory or Mail.ru Group. These suppliers mostly specialize in selling ready-to-use real-time analytics to the third parties rather than applying these tools in their everyday business practices.

This investigation would demonstrate a more technology-oriented angle of the problem and illustrate the specifics of the first-hand development big-data-based analytical platforms. However, the market of big data vendors differs significantly from the market of big data users, so this suggestion would move the study into a completely new research area.

It is also important to pay attention once again to the fact that this study is focused only on analysis of competences of Russian companies applying big data analysis as a marketing tool. Therefore, foreign business entities which might as well apply big data analysis in marketing for doing business in Russia have been from the very beginning considered out of scope of the study. This research is primarily concerned with exploration of current practices of solely Russian organizations which we believe have a great potential in technology adoption and is aimed at demonstrating specifics of implementation of big data analysis only by national market players.

Conclusion

Today in order to succeed in a highly competitive business environment companies throughout the world consider innovation one of the major growth drivers. Big data analysis is considered to be one of today's top business innovations. It has recently gained extremely high interest by the business community all over the world. Companies are attracted by the variety of managerial implications of big data analysis across all business functions and industries and promising gains of this technology. Variety of marketing applications of technology which resolve customer-related problems are particularly highly demanded by companies

Being a part of the global business community, a number of Russian companies also have started to use big data analysis for solving marketing-related problems.

The topic of this master thesis is "*Big data analytics as a marketing tool: the best practices of Russian companies"*. The focus of this research study on marketing is justified by the current market trends and real-life evidence of companies' interest in marketing-related applications of the technology.

This research study is focused on *the analysis of practices of Russian companies* and *peculiarities of the Russian context*, since we believe that they also have great potential to benefit from these opportunities, yet specifics of the local market should be thoroughly analyzed and taken into account.

Due to the innovativeness of the topic, the specifics of using big data for marketing purposes in real-life business environment have not been clearly defined and examined by researchers as well as by business practitioners. Neither in foreign publications, nor in Russian ones there is a significant number of thorough and comprehensive research studies conducted on obstacles and barriers of execution big data analysis as a marketing tool which would be based on real-life cases.

The research goal of this study is to determine the factors which impact current practices of using big data analysis as a marketing tool by Russian companies and develop recommendations for them while *the research object* is peculiarities of usage and implementation of big data analysis for marketing purposes by Russian companies.

Thanks to the innovativeness of the topic and current insufficient level of investigation of big data marketing in the Russian context by researchers as well as business practitioners this study is a subject of *exploratory research.*

The major *research questions* form a basis for the empirical part of this study, which consists of *multiple case study analysis*:

1. Why Russian companies resort to big data analytics as a marketing tool?
2. How do Russian companies execute big data technology as a marketıng tool?

3. How do Russian companies overcome barriers connected with big data analysis as a marketing instrument?
4. How can Russian companies leverage the expertise of global market leaders in order to empower big data analytics for marketing purposes in Russian market?

Besides, it is important to mention that insufficient level of implementation and analysis of big data marketing by Russian as well as foreign companies puts limitations on the variety of industries which are investigated in this study. As a result, four Russian companies from two major market sectors, where large amounts of data are being generated, have been selected for analysis - telecommunications and retail.

The research has demonstrated that success of Russian companies' practices in big data marketing depends severely on *external environment* and *overall level of big data market development* in Russia.

While foreign companies have had more time to master big data execution at their organizations and benefit from the higher stage of market development, Russian companies remain pioneers in this field. The have just started to build and leverage capabilities, which is a very time- and resources-consuming process with no quick financial returns.

The majority of obstacles, which have been revealed in this study, such as *lack of existing performance evaluation metrics, competent human resources* and *global best practices*, result from the insufficient level of market development and technology adoption by business practitioners all over the world.

However, the research has shown that the relative strength of these factors may vary. Russian companies have several alternatives at their disposal which enable them is to overcome these barriers in short-term perspective, one of which, is for example, *collaboration with external suppliers*.

The study has also illustrated that today a Russian company can still achieve marketing objectives and gain commercial success in executing data-driven marketing.

It is crucial to emphasize the impact of such factor as *the existence of organizational capabilities* to analyze and derive valuable insights out of this data. Empirical research has demonstrated that there is a major difference in considering big data analysis among companies which already have existing practices of conducting business analytics on a regular basis and among those who have never paid a lot of attention towards analysis of data generated by the company.

According to the study's findings, none of the Russian organizations have yet decided to build a comprehensive data strategy at their organization to develop data management across all

internal organizational units. In most of the cases Russian companies have just recently started to use the technology and they are still at the stage of testing effectiveness of big data analytics.

With regards to managerial implications of the study, it is recommended to take into account the paramount importance of data-driven *behavioral analytics* with *segmentation program* as the kernel of it. A thorough segmentation forms a basis for further big data marketing strategy and provides an organization with a plenty of valuable insights about its customers. In addition, the majority of the investigated companies emphasized *personalized recommendations programs* as one of the most effective and successful data-driven marketing initiatives.

Moreover, empirical research has demonstrated that it is important that big data analysis solves marketing problems not only directly, but also *indirectly* as a consequential effect of data-driven technical (infrastructural) applications of technology. Sometimes Russian companies resort to big data analysis in order to optimize the technical side of the process and as a result become more customer-oriented and achieve positive commercial results.

There is no doubt that these companies are considering investments also in other innovative solutions for their businesses (e.g. Internet of things, video streaming, etc.), but the empirical research has demonstrated that the importance of big data marketing is planned to remain at the high level as it is at the moment.

References

Analytical review of the big data market. (2015). IPO Board, Moscow Stock Exchange. From: http://www.ipoboard.ru/ru/news/0b4247b31eae6a3007c080e0a6fbf743

Alderson,W. (1957). *Marketing Behavior and Executive Action*. Homewood, IL: Richard D. Irwin, Inc.

ATI-Media.Ulmart will demonstrate a new project in Cannes at MIPIM. (2016). From:http://ati.su/Media/News.aspx?ID=84424&HeadingID=13

Arthur, L. (2013). *Big data marketing: engage your customers more effectively and drive value*. John Wiley & Sons, 208p.

Bacon, J. (2014). What's your chief marketing officer really thinking?. *Marketing Week (Online Edition)*, 15.

Beddow, T.F. (1995). Panel discussion on developing future market leaders. *Marketing Science Institute Board of Trustees Meeting*, Dana Point, CA.

Bendle, N.T., Wang, X.S. (2016). Uncovering the message from the mess of big data. *Business Horizons*, Vol. 59, Issue 1, 115-124.

Big Data: A Competitive Weapon for the Enterprise. (2014). Datameer. From: http://www.datameer.com.

Big Data Analytics. Intel's IT Manager Survey on How Organizations Are Using Big Data. (2012). Intel report.

Big Data: The Next Frontier for Innovation, Competition, and Productivity. (2011) McKinsey Global Institute- 156 pages.

Big data survey Europe. Usage, technology and budgets in European best-practice companies. (2013). BARC Institute: Wuerzburg, Germany- 47 pages.

Big data vendor revenue and market forecast 2013-2017. (2014). Wikibon. From: http://wikibon.org/wiki/v/Big_Data_Vendor_Revenue_and_Market_Forecast_2013-2017

Big success with big data. Executive Summary. (2014). *Accenture*, 12p. From:http://www.acccenture.com/analytics

Camp, R. (1989). *Benchmarking: The search for industry best practices that lead to superior performance.* ASQ Quality Press.

Columbus, L. (2015). 56% of enterprises will increase their investment in big data over the next three years. From http://www.forbes.com.

Columbus, L. (2014). Roundup of Analytics, Big Data & Business Intelligence Forecasts and Market Estimates, 2014. From http://www.forbes.com.

Cnews. Overview of business analytics and big data in Russia in 2014. (2014). From: http://www.cnews.ru/reviews/bi_bigdata_2014/articles/perspektivy_biznesanalitiki_v_rossii

Cnews. The largest big data projects in Russia. (2014). From: http://www.cnews.ru/tables/a9249186ccefd9e546774ec36da1970ba20ca212/

C-level executives seeing big results from big data.(2014). From: http://www.cio.com/article/2607333/big-data/c-level-executives-seeing-big-results-from-big-data.html

Davis, J. (September, 2014). Digital tools, physical results. *Marketing insights,* 36-41.

Dietrich, B.L., Plachy, E., Norton. F.C.(2014). *Analytics Across the Enterprise: How IBM Realizes Business Value from Big Data and Analytics.* IBM Press, 194p.

Dijcks, J. (2012). Big Data for the Enterprise, Oracle report.

Dougherty, C., Holmes, E. (2010). Consumer spending perks up economy. Wall Street Journal, 1p.

Dubois A., Gadde L. (2002). Systematic Combining: An Abductive Approach to Case Research, *Journal of Business Research, 55*, pp. 553-560.

Dumbill, E. (2013). Making sense f big data (editorial). *Big Data*, 1 (1), 1-2p.

Elmalem, Y., Hughes, H. (2015). Opening the Core Data of Banking Systems to Community Bankers. *Virginia Banking Journal*, 16-19.

Feinleib, D. (2014). *Big data bootcamp: what managers need to know to profit from the big data revolution*. Apress, 236 p.

Frampton, M. (2015). *Big Data Made Easy: A Working Guide to the Complete Hadoop Toolset*, Apress, 375p.

From token loyalty to meaningful relationships. How loyalty programs and big data analytics are facilitating CRM in the retail sector. (2014). *Marketline Case Study,* 21p.

Garry, M. (2005). Doing more with the data. *Supermarket News*, 91-98.

Gerring, G. (2004). What is a case study and what is it good for? *American Political Science Review, 98,* 341-354.

Going to Market in Developing Economies: Winning Big by Targeting Small. (2014). From: http://www.bcgperspectives.com.

Kash, R., Calhoun, D. (2010). *How Companies Win: Profiting from Demand-Driven Business Models No Matter What Business You're In.* HarperCollins, 272

Kotler, P. (1967). *Marketing Management: Analysis Planning and Control. Englewood Cliffs,* NJ: Prentice-Hall, Inc.

Kotler, P. (1997). Marketing Management, *Prentice Hall, NJ*, 789p.

Kotler, P., Armstrong, G., Harri, L.C., Piercy, N.Principles of Marketing. (2013). Pearson Education Limited, 683p.

Krajicek, D. (2013). Making big data actionable. *Marketing Insights,* 8-9.

Laney, D. (2001). META Gr. Res. Note 6.

Lauterborn, B. (1990). New Marketing Litany: Four Ps Passé: C-Words Take Over. *Advertising Age*, vol.61, no.4, pp. 26.

Liebowitz, J. (2013). *Big data and business analytics*. Auerbach Publications, 304 p.

Lostakova, H. (2009). Benefits of CRM differentiated on the basis of customer lifetime value. *Economics & Business,* 1-7.

Linden, K. (2007). Tech tools help marketers spread the word. *Shopping Centers Today*, 104-104.

Making Big Data work in Retailing. (2013). From: https://www.bcgperspectives.com/

McCarthy, E. Jerome. (1960). *Basic Marketing: A Managerial Approach*, Homewood,IL: Richard D. Irwin, Inc.

Mckechnie, S. (2006). Integrating intelligent systems into marketing to support market segmentation decisions. *Intelligent Systems in Accounting, Finance & Management,* 117-127.

Minelli, M., Chambers, M., Dhiraj, A. (2013). *Big Data Technology, in Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses*. John Wiley & Sons, Inc.- 224p.

MTS. From: http://www.mtsgsm.com

Nayler, K. (2014). Trends + issues. *Marketing Magazine,* 10-12.

Networkworld. Comparing the top Hadoop distributions. (2014). From: http://www.networkworld.com/article/2369327/software/comparing-the-top-hadoop-distributions.html

Overby, S. The CIO and CMO Perspective on Big data. (2014). From: http://www.cio.com/article/2461403/cio-role/the-cio-and-cmo-perspective-on-big-data.html

Saren, M. (2006). *Marketing Graffiti: The View from the Street.* Routledge.

Sauer, C. (2015). Collaboration and accountability are at the core of initiatives using big data. *Credit Union Magazine,* 34-37.

Schramm, W. (1971). Notes on case studies of institutional media projects. *Working paper for the Academy for educational development*, Washington, DC.

Schroeck, M., Shockley, R., Smart, J.,Romero-Morales, D.,Tufano,P. (2012). Analytics: The Real-World Use of Big Data,IBM report.

Sheth,J.N., Sisodia, R.S. (2012). The 4A's of Marketing. Creating Value for Customers, Companies and Society. Routledge, 209 p.

Sheth-Voss, P., Carreras, I.E. (2010). How informative is your segmentation? *Marketing Research*, 9-13.

Stewart, M. (2015). Big data's big mistake. *Smart business Northern California*, 7-7.

The big bang: How the big data explosion is changing the world. (2013). Microsoft News Center. From: http://news.microsoft.com/2013/02/11/the-big-bang-how-the-big-data-explosion-is-changing-the-world/

The big data gap. (2013). From: http://www.bcgperspectives.com.

Top 6 Hadoop vendors providing big data solutions in open data platform. (2015). Dezyre. From: https://www.dezyre.com/article/-top-6-hadoop-vendors-providing-big-data-solutions-in-open-data-platform/93

Piccoli, G. (2005). IT-dependent strategic initiatives and sustained competitive advantage: a review and synthesis of the literature. *MIS Quarterly*, 747-776.

Ragin C. (1997). Turning the Tables: How Case-Oriented Research Challenges Variable-Oriented Research, *Comparative Social Research, 16*, 27-42.

Rogers, B. (2014). Are You A Leader or A Laggard In Data-Driven Marketing?. *Forbes.Com*, 2p.

Rosbusinessconsulting. The company will help Russian Railways to optimize the traffic. (2015). From: http://www.rbc.ru/technology_and_media/01/07/2015/5593fd8a9a7947c393a79438

Rosbusinessconsulting. Ulmart will follow the Alibaba's way. (2015). From:http://www.rbc.ru/business/24/06/2015/558976a89a7947333e5f2f5a

Rule, P., John, V. M. (2015). A Necessary Dialogue: Theory in Case Study Research. *International Journal Of Qualitative Methods*, *14*(4), 1-11.

Vedomosti. Mobile operators know everything about their customers. (2015). From: https://www.vedomosti.ru/technology/articles/2015/05/26/593579-sotovie-operatori-znayut-vse-o-svoih-abonentah

Ulmart. For investors. From:http://investors.ulmart.ru/

Weber, L., Henderson, L. L. (2014). *The digital marketer: ten new skills you must learn to stay relevant and customer-centric*. John Wiley & Sons, 368p.

Webster, F.E., Jr. (1997). The future role of marketing in the organization. In Reflections on the Futures of Marketing. Cambridge, MA: Marketing Science Institute.

Weitz, B., Wensley, R. Handbook of Marketing.(2002). Sage Publications Ltd, 583 p.

Yandex data factory. World of Tanks achieves a new level of churn prevention through the implementation of YDF's data analysis. From: https://yandexdatafactory.com/case-

studies/world-of-tanks-achieves-a-new-level-of-churn-prevention-through-the-implementation-of-ydfs-data-analysis/

Yin, Robert K. (1981a). The case study as a serious research strategy. *Knowledge: creation. Diffusion, utilization, 3*, 97-114.

Yin, Robert K. (1981b). The case study crisis: Some answers. *Administrative Science Quarterly, 26,* 58-65.

Yin, Robert K. (2014). Case Study Research: Design and Methods - fifth edition. *Library of Congress Cataloging-in-Publication Data*, 282p.