The potential for big data application in the marketing of banking institutions

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ABSTRACT

The application of big data technology in various industries and sectors has been a significant area of research interest lately. The aim of this paper is to contribute to the field by summarizing existing knowledge on the topic of big data and explore its application in the domain of marketing with special emphasis on banking institutions. The reason for this is the fact that banks, with their turbulent environment characterised by high competition, strict regulatory requirements and consumer centricity, are especially eligible for absorbing benefits of big data technology adoption. The paper is structured in a way that general big data characteristics are presented after the introductory notes. Following is the section related to big data application in marketing. In the fourth section authors discuss banking environment and potential for big data application in the marketing of banks.

KEYWORDS. Big data, marketing, banks

1 INTRODUCTION

Big data technology has been an important topic of research among scientific public in recent years and there is a great interest for its usage in different industrial sectors. The purpose of this paper is to examine potentials of usage of big data technology for marketing purposes in banking industry. Motivation of authors is to present possible applications of big data in marketing in banks with the aim of enhancing the business processes.

Provost and Fawcett [11, 2013] state that "with vast amounts of data now available, companies in almost every industry are focused on exploiting data for competitive advantage". Bakshi [1, 2012] argues that "the challenge is not only to collect and manage vast volume and different type of data, but also to extract meaningful value from it". According to Ruediger et al. [13, 1997] better understanding of customer needs can help banks acquire new customers, sell more products to those customers and prevent other customers from taking their business elsewhere. This statement is as topical nowadays due to the fact that banks are exposed to multiple challenges: coping with the pressure of competition, satisfying customer needs and being complied with regulatory requirements related to risk management but also on legal provisions regarding consumer protection.

This paper is divided in five sections. Following the introductory notes, authors in second section discuss general terms related to big data. Third section is related to overview of existing research on the topic of big data in marketing. The focus of the fourth section is on discussion of the application of big data in marketing in banks. Finally, conclusions are presented.

2 GENERAL OVERVIEW OF THE BIG DATA CONCEPT

Syed, Gillela and Venugopal [14, 2013] define big data as "data that exceeds the processing capacity of conventional database systems. The data is too big, moves too fast, or does not fit the strictures of your database architectures. To gain value from this data, you must choose an alternative way to process it."

Desouza and Smith [5, 2014] define big data through its characteristics, the so called "7 V's", namely:

- *Volume*: considers the amount of data generated and collected,
- *Velocity*: refers to the speed at which data are analysed,
- *Variety*: indicates the diversity of the types of data that are collected,
- *Viscosity*: measures the resistance to flow of data,
- *Variability*: measures the unpredictable rate of flow and types,
- *Veracity*: measures the biases, noise, abnormality, and reliability in datasets,
- *Volatility*: indicates how long data are valid and should be stored.

Desouza and Smith [5, 2014] also argue that "the most challenging *V* for organizations is *variety*" due to the fact that integration of heterogeneous datasets and integration of new sources of data (in terms of origin and type) requires economisation of process.

As for potential benefits of big data usage for organizations some authors discuss that in the past departments across organization have had each their own datasets which they managed separately, but big data analytics is based on the premise that this data can be linked together in order to receive synergic effects for both the organization, clients and business partners [12, 2012]. The others argue that the value of big data to an organization falls in one of following two categories: analytical use or enabling new products [14, 2013]. Watson [16, 2014] points out that "collecting and storing big data creates little value; it is only data infrastructure at this point. It must be analysed and the results used by decision makers and organizational processes in order to generate value". Davenport and Dyche [3, 2013] argue that managers are impressed with one of three other aspects of big data: the lack of structure, the opportunities presented and low cost of the technologies involved. The same authors also point out following opportunities arising from big data usage in organisations:

- Cost reduction,
- Substantial improvements in the time required to perform a computing task, or new product and service offerings,
- Support for internal business decisions [3, 2013].

According to a survey conducted by TDWI [15, 2011] 70% of respondents consider big data technology as an opportunity and not a problem for their organisation because it yields detailed analytics for business advantage.

In order to use big data as a tool for business decisions support organizations are expected to incorporate big data analytics process. Gandomi and Haider [7, 2015] define following possible types of big data analytics for structured and unstructured data:

1. Text analytics
   a. Information extraction
   b. Text summarization
   c. Question answering
   d. Sentiment analysis
2. Audio analytics
   a. Large-vocabulary continuous speech recognition systems
   b. Phonetic based systems
3. Video analytics
   a. Server-based architecture
   b. Edge-based architecture
4. Social media analytics
   a. Content based analytics
   b. Structure based analytics
   c. Community detection
   d. Social influence analysis
   e. Link prediction
5. Predictive analytics (statistical methods)

Power [10, 2013] defines three major types of analyses that can be prepared with new data sources and data manipulation technologies:
1. Retrospective data analyses – using historical data and quantitative tools to understand patterns and results to make inferences about the future. This is the area of business intelligence.
2. Predictive data analyses – using simulation models to generate scenarios based on historical data to understand the future. Predictive means 'looking forward' and making known in advance.
3. Prescriptive data analyses – using planned, quantitative analyses of real-time data that may trigger events. Prescriptive analyses recommend actions.

3 BIG DATA IN THE MARKETING CONTEXT

The application of big data in marketing has been a topic of interest among scientific public but also among marketing specialists. In this section the authors will present an overview of existing available research related to big data usage in the domain of marketing.

According to TDWI Best practices report [15, 2011] implementation of big data technology ensues benefit for following areas: better targeted social influencer marketing, more numerous and accurate business insights, segmentation of customer base, recognition of sales and market opportunities, automated decisions for real time processes, definition of churns and other customer behaviour, detection of fraud, greater leverage and ROI for big data, quantification of risks, trending for market sentiments, understanding of business change, better planning and forecasting, identification of root causes of cost, understanding consumer behaviour from clickstreams, manufacturing yield improvements. McKinsey Global Institute [8, 2011] specifies, amongst others, following potential of big data in retail segment: in store behaviour analysis, variety and price optimization, product placement design, improved performance, labour inputs optimization, distribution and logistics optimization, web based markets. As can be seen from the cited sources, the researchers find big potential for big data usage and its implementation in the marketing field.

The influence of new, digital data on marketing is noticeable also when discussing types of data used for analysis. In continuation to this, Rogers and Sexton [12, 2012] divide possible types of data collected by marketers as:

- traditional (demographic, customer transaction data, customer usage data) and
- digital (social media content created by customers and targets, social network ties and influence between customers and targets, customer mobile phone/device data).

Having in mind the fact that the dynamics of retrieving data is dependable on the type of data and "the 7 V's" as main characteristics of big data, it is evident that there are many sources that can be used in process of data extraction. Watson [16, 2014] gives following examples of potential sources of big data:

- *Web log files* used to improve understanding of clients' buying behaviours and to influence their consumption by dynamically recommending products,
- *Social media data* analysis that can be used for understanding what people think about new product introductions,
- *Data generated from machines* can be used together with pricing plans in order to motivate certain customer behaviour,
- *Geospatial* (e.g., GPS) data that can be used in order to receive offers from nearby services,
- *Image, voice, and audio* analysis for applications in domain of security systems.

Although big data offer variety of opportunities for application in the marketing domain, big data itself is not enough. Rogers and Sexton [12, 2012] point out that in order to leverage the opportunities of big data, marketers need to improve their ability to:

- Collect meaningful customer data from a variety of sources, including real-time data,
- Link that data to metrics developed for measuring marketing ROI,
- Share data across the organization, linking datasets together at the customer level,
- Utilize this shared data to effectively target and personalize marketing efforts to customers.

4 THE APPLICATION OF BIG DATA IN MARKETING IN BANKS

According to Oracle research [9, 2015] "banks and financial services companies seek to differentiate themselves by developing and delivering unique products and services for their customers. However, in this very competitive industry, successful products are often copied and the customer's barrier to exit is very low." Oracle research [9, 2015] also suggests that financial institutions are nowadays transient nodes for the customer who is the centre of attention, in sense that he chooses his business relationships with a number of institutions that offer financial services depending on what he assess as the most profitable combination in terms of what he gets from that relationship. Consumers also expect to have full transparency about the products and services being offered and thus for banks and financial services companies to keep customers for the long term, they must get closer to them and anticipate customer needs and be able to proactively position their products [9, 2015].

According to Deutsche Bank research [6, 2015] "gaining a more complete understanding of a consumer's interests and preferences is necessary to ensure that banks can continue to address customer satisfaction and for building more extensive and richer predictive models. Big Data technologies provide the ability to collect and integrate and augment

transactional and unstructured data from within and outside of the firm and hence play a pivotal role in enabling customer centricity in this new reality".

Deutsche Bank research [6, 2015] findings suggest that the drivers of big data technology adoption in financial industry are:
- Explosive data growth,
- Regulation,
- Fraud detection and security,
- Customer insight and marketing analytics.

According to Capgemini Consulting [2, 2014] big data analytics can help banks maximize value from customer data in three segments, namely:
- Acquiring customers (improving credit risk estimation and maximizing lead generation potential),
- Growing share of wallet (driving efficiency of marketing programs and increasing sales through predictive analysis),
- Retaining customers (limiting customer attrition and improving customer satisfaction).

Oracle research [9, 2015] amongst others points out following solutions expected to arise from big data project in financial institutions:
- Increased customer wallet share (gaining insight into the life cycle of a customer),
- Customer intimacy (better understanding of the customer enables positioning the right product at the right time for the right price),
- Reputational risk management (protecting the brand by understanding customer sentiment towards the bank, its board members or employees).

In continuation to the big data sources previously defined by Watson [16, 2014], there are some other specific data sources that banks may use, such as call centres, tellers or branch personnel in order to understand the paths that customers follow through the bank, and how those paths affect attrition or the purchase of particular financial services [3, 2013]. The Deutsche Bank research [6, 2015] states that external sources of data are social networks, customer call records, customer emails, claims data (albeit in an unstructured format) and that they provide them with psychographic information about the consumer, aside from utilising internal systems information. The same research also gives an example of use of geotargeted advertising in financial industry as an excellent application of data arising from various sources [6, 2015].

De Fortuny, Martens and Provost [4, 2013] observe that "big data thinking opens our view to non-traditional data for predictive analytics—datasets in which each data point may incorporate less information, but when taken in aggregate may provide much more". In that context it is acceptable to assume that some prerequisites need to be satisfied in order to gain the most value from big data. Rogers and Sexton [12, 2012] state that in order to effectively harness the capabilities of new digital tools, marketers need to:
- Set clear business objectives for any digital marketing effort,
- Develop a variety of metrics for new digital tools (audience metrics, engagement metrics, financial metrics),
- Develop models that link channel-specific digital metrics (like retweets or Facebook interactions) to universal metrics, including key performance indicators (KPIs),
- Continuously innovate new measurement models as new digital tools and marketing rapidly evolve.

5 CONCLUSION

In this paper authors have presented an overview of available research on the usage of big data in the domain of marketing. An attempt has been made to point out the value of big data application in banking due to the fact that banks nowadays operate in highly competitive, strictly regulatory proscribed and client centric market and big data may contribute to banks' position by adding extra value, especially in sense of gaining more insight into client's habits, creating more intimate relationship with client, managing reputational risk and reducing costs. Having on mind continuous developments in the field of big data research there is a variety of topics to be covered in future research with special emphasis on developing metrics and measurement models that contribute to the field of marketing by measuring ratio of value of investment made in application of big data technologies and benefits received.

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