

## BIG DATA IMPLEMENTATION IN SMALL AND MEDIUM ENTERPRISES IN INDIA AND POLAND

Zdzislaw POLKOWSKI<sup>1</sup>, Rajesh KHAJURIA<sup>2</sup>, Sameer ROHADIA<sup>3</sup>

<sup>1</sup> Jan Wyzykowski University, Poland, z.polkowski@ujw.pl

<sup>2</sup> CKSVIM Business School, Vadodara, India, dr.khajuria@gmail.com

<sup>3</sup> CKSVIM Business School, Vadodara, India, rohadiasameer@yahoo.com

**Abstract:** *Today we are having a huge information explosion across the world. Earlier the amount of information was increasing arithmetically, but today, information has expanded in geometric series. The concept of big data has been around for years; most organizations now understand that if they capture all the data that streams into their businesses, they can apply analytics and get significant value from it. Big Data isn't just for large enterprises with large budget. Today, small companies can have the benefits of the monumental amounts of digital data to make right and fast decisions to develop their enterprises. In fact, over the last couple of years, small and mid-size companies have seen more big data deployments than the big competitors. In India and Poland, the data boom isn't just limited to big enterprises, the growth of big data startup/technology vendors, is helping SMEs in scaling up infrastructure capabilities and driving insights from data. The increased availability of accessible, cheap data centres delivered by cloud vendors, has brought down the costs of upfront investment for small businesses, thereby reducing the market entry barrier. It is the question of choosing the right analytics vendors that fits the bill for small businesses. This paper aimed at designing a framework of Big Data implementation in SMEs. The reason for selecting these two countries is that there are international tie-ups between two universities of both countries.*

**Key words:** Big Data; SMEs; implementation; India; Poland.

**JEL Classification Codes:** C80, A10, C88.

### 1. INTRODUCTION

The fruits of the information society are easy to experience, with a cell phone in every scoop, a computer in every backpack, and big information technology systems in back offices everywhere. But less noticeable is the data itself. Half a century after computers entered mainstream society, the data has begun to accumulate to the point where something new and special is taking place. Not only is the world awash with more information than ever before, but that information is growing faster. The alteration of scale has led to a change of state of the art. The quantitative change has contributed to a qualitative one. The sciences like astronomy and genomics, which first experienced the explosion in the 2000s, coined the term “Big Data”. The concept is now migrating to all areas of human endeavour (Mayer-Schoberger, et al., 2013).

Small and Medium Enterprises (SMEs) have an important part in the Indian and Polish manufacturing sector and experience become the locomotive of economic development in India and Poland. Today, small and medium companies occupy a position of strategic importance in



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the Indian and Polish economic structure due to its significant contribution in terms of output, exports and employment.

The SME sector has a chance to benefit from the Big Data analysis technology. Funds allocated by large companies to collect data are not available to smaller enterprises. Modern IT systems as well as data analysis systems are a huge expense, often unjustified in the case of SMEs. Profits that SMEs would achieve using such extended methods would be incomparably small in relation to the incurred costs of purchasing, implementing and maintaining Big Data systems. However, it is evident that the strength of SMEs is the ability to make quick changes and adjustments - the flexibility of doing business.

### 1.1 Definition of big data

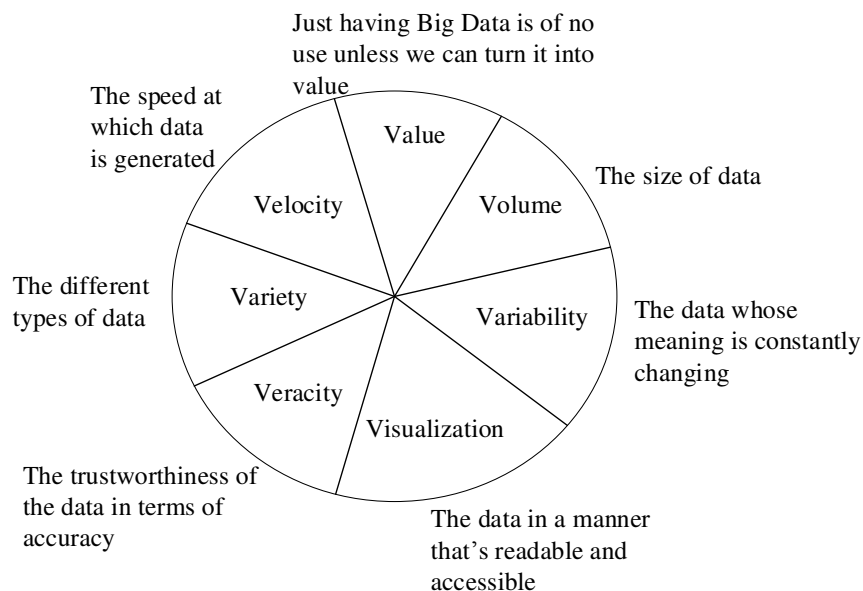
At this point, there is no rigorous definition of large data. Initially the thought was that the volume of information had grown so large that the quantity being examined no longer go into the memory that computers use for processing, so engineers needed to revamp the tools they used for dissecting it all. That is the beginning of raw processing technologies like Google’s MapReduce and its open-source equivalent, Hadoop, which arrived out of Yahoo.

The review of definition, classification and technological challenges regarding to Big Data you can find in the work of Tabakow, Korczak and Franczyk (2014) titled “Big Data – definitions, challenges and IT technologies ”.

Big Data refers to data that is too large to fit on a single host, too unstructured to fit into a row-and-column database, or to continuously flowing to meet in a static data warehouse. The point is not to be dazzled by the volume of information, but rather to analyse it – to convert it into insights, inventions and business value (Thomas Davenport, 2013).

The term “Big Data” started to take off in the fourth quarter of 2010 in Silicon Valley. It generates value from the storage and processing of very large quantities of digital information that cannot be analysed with traditional computing techniques. It is data whose scale, variety and complexity require new architecture, techniques, algorithms and analytics to manage it and extract value and hidden knowledge from it.

Big Data has also been defined in the form of 7 V’s. They are as follows:



**Figure 1. The 7Vs of Big Data** (Navdeep Singh Gill, 2016)

**Volume:** It is how much data we have – what used to be measured in Gigabytes is now measured in Zettabytes (ZB) or even Yottabytes (YB). The IoT (Internet of Things) is creating exponential growth in data. Every company is swamped with data, which can be incredibly valuable, if we know how to use it (Berniz, 2017).

**Velocity:** It refers to the increasing speed at which the data is produced, and the increasing speed at which the information can be processed, stored and analysed by relational databases.

**Variety:** It describes one of the biggest challenges of big data. It can be unstructured and it can include so many different types of data from XML to video to SMS. Organizing the data in a meaningful way is no simple task, especially when the data itself changes rapidly (Berniz, 2017).

**Variability:** It refers to data whose meaning is constantly changing. It is different from Variety. The same is true of data, if the meaning is constantly changing, it can have a huge impact on our data homogenization.

**Veracity:** It is all about making certain the information is accurate, which requires processes to prevent the defective data from rolling up in our organizations. What's crucial to understanding Big Data is the messy, noisy nature of it, and the quantity of work that goes into making an accurate dataset before analysis can even begin (McNulty-Holmes, 2014).

**Visualization:** Using charts and graphs to visualize large quantities of information is a lot more efficient in conveying meaning than spreadsheets and reports which are full of numbers and rules. Visualizations can contain lots of variables and parameters (Berniz, 2017).

**Value:** After addressing volume, velocity, variety, variability, veracity and visualization – which takes a lot of time, effort and resources – we want to be sure our organization is getting value from the data. The value lies in rigorous analysis of accurate data, and then information and insights this provides (Berniz, 2017).

## 2. LITERATURE REVIEW

A significant number of scientific and professional publications on Big Data in SMEs (Small Medium Enterprises) have been analysed in this article. You can point out: (Anthony Soroka et al., 2017), (Daruk Sen, et al., 2017), (Shirley Coleman et al., 2016), (Manish Mittal, 2017). The literature review of Big Data presents that the research on this issue has mainly concentrated on the Big Data concept, its features, benefits, services, models and security aspects from a technological point of view. At this place, there is not sufficient number of works related to implementation of Big Data in SMEs (Ogbuokiri et al., 2015).

Quite interesting work is the book: "Big Data for SMEs: questions about opportunities, challenges, benefits and operations" (Edited by Liam Mawhinney et al., 2013), which contains current information about the analysed issue.

Some researchers and IT specialist stated that SME do not have a market for big data because they do not have big data. Small and medium-sized enterprises (SMEs), which may generate just as much data, have similar big data needs, but are often not as savvy as the bigger companies in harnessing the full potential of big data. (Aaron Tan, 2015) Many SMEs are now looking at big data as more than just a fad or trend. And few of them have identified the utility of Big Data with regards to sales trends and are using it to improve their productivity and in turn, enhancing profitability (Aspire Media Pvt Ltd, 2017). In fact, a recent report by Research and Market forecasts that the global big data market for small and medium-sized enterprises (SMEs) will grow at a compound annual rate of 43 percent until 2018 (Derek Du Preez, 2014). Above that, Simons (2013) says, that although smaller companies typically have limited resources and smaller budgets, they do have other advantages: typically, a more flexible IT infrastructure, with fewer legacy system issues or disparate databases, and an ability to change practices quickly (Peter Simons, 2013). Carl Johan Rising, Michael Kristensen and Steffen Tjerrild (2013)

strongly recommend SME's to prioritize big data from a strategic point of view based on the conclusions about improving performance of data driven organizations (Carl Johan Rising et al., 2014).

This article is coordinated as follows: Section 1 introduces Big Data and its role from an economic point of opinion. Section 2 introduces the main concepts of Big Data that have been acquainted with the available literature. Section 3 explains the methodology of a scoping review. Section 4 shows the results- answers for the doubts described in Section 3. Section 5 provides the conclusions and proposals for future study.

### **3. RESEARCH METHODOLOGY**

#### **Problem Statement**

An analysis of the Big Data in selected SMEs in India and Poland shows that this form of solution is in the early phases of growth. The degree of implementation depends on many factors. This results from the fact that:

- Managers very often do not have a strategy for developing Big Data systems.
- There is a lack of digital business culture in India and Poland.
- In above respect, there is a lack of a sufficient degree of skills and knowledge related to ICT.
- At this point it is problematical access to investments and financial support.
- Managers in SMEs do not have decent knowledge of Big Data.
- On that point, there are still unpredictable conditions to lead a job.

It considers the level of technological obstacles, limits the managers in the implementing innovative changes and ultimately contributes to pulling in low profits from business activities. In India and Poland, only some managers are mindful of the demand for implementing Big Data systems. Consequently, few of them whenever possible, try to change state of art.

#### **Research gap**

It can be noted that, research in the area of SMEs and in particular micro-enterprises is not an interesting area of inquiry for many researchers. SMEs do not receive substantial funds to carry on research, and it can even be stated that in most cases they do not accept them at all. Only EU programs seem to be an incentive for joint activities for businessmen and researchers from Poland. Nevertheless, in this instance, this does not solve the problem because of the involvement of business owners in the daily responsibilities associated with the company's operations. These elements mean that SMEs from the scientific point of view still seem to be a corner field.

#### **The Goal of the Study**

- To highlight the benefits of implementation of Big Data in SMEs;
- To identify Big Data technologies which you can use in SMEs;
- To appropriate requirements of SMEs working with Big Data
- To appropriate steps to create Big Data in SMEs

#### **Research Questions**

- Which benefits of implementation of Big Data in SMEs may be noticeable?
- Which Big Data technologies you can use in SMEs?
- Which requirements of SMEs you can point out working with Big Data?
- Which steps should be done to create Big Data in SMEs?

#### **Research method**

In this paper, we have examined several instances, IT companies, several ICTs and economic papers concerning the current situation in SMEs in India and Poland. Additionally, the

owners of the Indian and Polish SMEs were interviewed. The paper starts by demonstrating the benefits of the use Big Data. Later, the paper reflects on the development of the use of Big Data in India and Poland. For the thesis, the Internet was the source of the latest information, not available yet in the papers. The information for the research were also collected from primary sources viz. company reports, official websites of the company and secondary sources like books, articles and journals, company reports with data concerning the Polish SMEs. Telephone conversations were made out by instances of Big Data companies responsible for carrying into action of innovative solutions for SMEs. Moreover, one of the author's personal experience in operating a small IT company, constitutes a substantial origin of value, true and actual information on the functioning of Big Data in Poland. So, the authors feel that this methodology seems appropriate for the achievement objectives of this inquiry.

## **4. RESULTS**

### **1.2 Benefits of Big Data are as follows:**

Jennifer Lawinski (2012) admits that competitive advantages of Big Data in SMEs are as follows: making operations more efficient; boosting sales; lowering IT costs; becoming more agile; attracting and retaining customers, new data sources such as social media and mobile devices, expect a return on big data investments within one year. Whereas Marr (2016), Nupur N Mall (2016) suggest:

#### **Understanding and Targeting Customers:**

This is one of the largest and most publicized areas of big data use today. Big Data is used to better understand customers and their behaviours and preferences. Companies are keen to expand their traditional data sets with social media data, browser logs as well as text analytics and sensor data to get a more complete picture of their customers (Marr, 2016).

#### **Understanding and Optimizing Business Processes:**

Big Data is also increasingly applied to optimize business operations. Retailers are able to optimize their inventory based on predictions generated from social media data, web search trends and weather forecasts (Marr, 2016).

#### **Redevelop your products:**

Big Data can help you interpret how others perceive your products so that you can adjust them, or our marketing, if need be. Analysis of unstructured social media text allows you to reveal the opinions of your customers and even segment those in different geographical locations or among different demographic groups (Nupur N Mall, 2016).

#### **Personal Quantification and Performance Optimization:**

Big Data is not just for companies and governments, but besides for all people. You can immediately profit from the data generated from wearable devices such as smart watches or smart bracelets. Analysing this will bring new insights and can give feedback to individual users. (Marr, 2016).

#### **Fraud Detection:**

Fraud can be detected the moment it happens and proper measures can be taken to limit the damage. With a real-time safeguard system, attempts to hack into organization are notified instantly. Police forces use big data tools to catch criminals and even predict criminal activity.

#### **Perform Risk Analysis:**

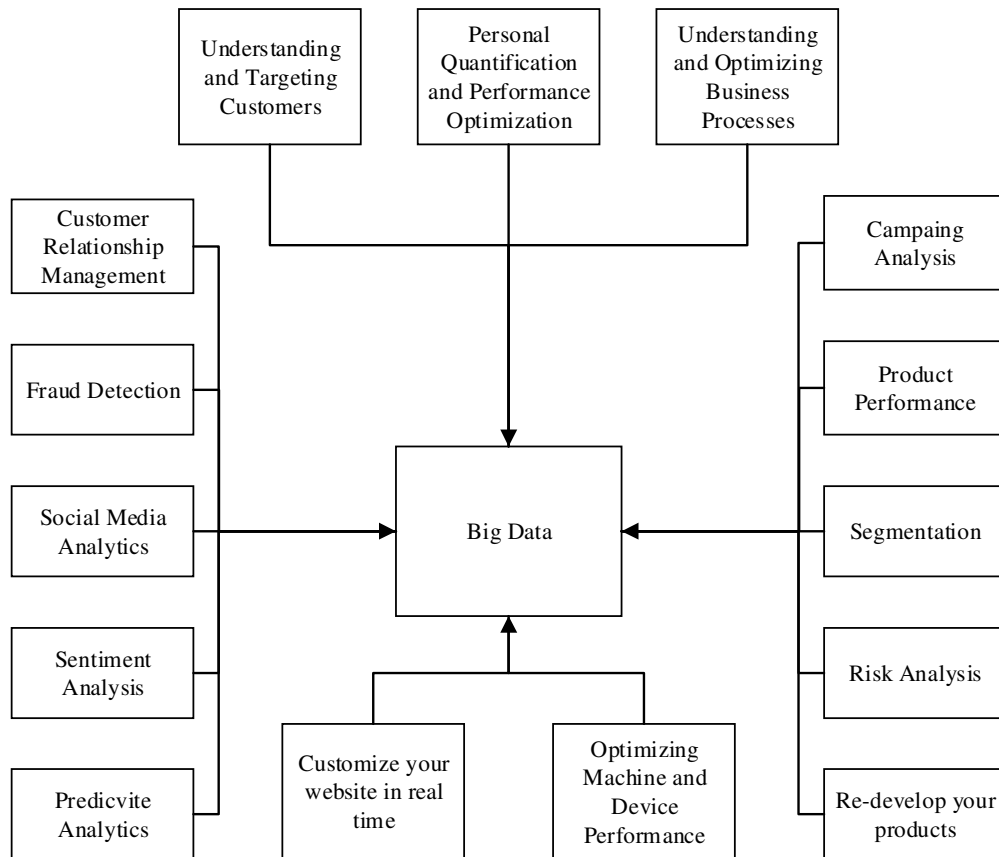
Social and economic factors are important for your accomplishments as well. Predictive analytics, fuelled by Big Data allow you to scan and analyse newspaper reports or social media feeds so that you permanently keep up to speed on the latest developments in your company and its environment.

**Customize your website in real time:**

Big Data analytics allow you to personalize the content or look and feel of your website in real time to suit each consumer entering your website, depending on, for instance their sex, nationality or from where they ended up on your site. E.g. Amazon’s ‘Frequently bought together’ and LinkedIn’s ‘People you may know’ feature.

**Optimizing Machine and Device Performance:**

Big Data help machines and devices become smarter and more autonomous. We can even use big data tools to optimize the performance of computers and data warehouses (Marr, 2016).



**Figure 2. Benefits of Big Data in SMEs, own elaboration based on Technavio (2014)**

**1.3 Big Data Technologies available for SMEs**

Analytical tools available on the market are becoming more and more intuitive and easy to use, which makes it easier to use them by less advanced users. Providers strive to ensure that the solutions they propose are not used only by a small group of specialists, but by different groups of users in the organization. Democratization of access to data is an opportunity for SMEs to use analytics in their current operations.

Big data tools can help in the analysis of data related to any aspect of a small business, helping in the field of: market research on the customer base and competition, measurements of the effectiveness of operations carried out, research on how employees work efficiently, assessment of marketing and sales activities undertaken, assessing the cost-effectiveness of the supply chain (Kaczmarek, 2017).

The interesting analysis of selected Big Data solutions for SMEs was carried by authors. Some of the proposals have been presented below (Ogbuokiri et. al):

**IBM's Watson Analytics:** Watson Analytics is a service that enables intelligent data analysis and visualization, because of which you will quickly discover patterns and true data sense. With data discovery tools, automated predictive analysis and cognitive processing capabilities, such as natural language dialogue, you can interact with data - "ask" them and receive understandable answers. Watson Analytics is always an invaluable help as it allows you to poll the system and receive transparent answers.

**Google Analytics:** Google Analytics is a free Google program that measures and collects data about the behaviour of users visiting the website. With it, you can check how users behave on the company's website and see which websites are the most popular. With Google Analytics, you can also find out if the site is engaging visitors, or if they leave the site as soon as they enter the first page. By using Google Analytics, you can measure specific customer behaviour, for example, at what word you made the purchase, sent an inquiry via the contact form or downloaded a file with the offer, which sources generate the most traffic to the website. It is a powerful tool that can successfully be used by micro, small and medium companies.

**InsightSquared:** The website focuses on the analysis of purchase and sales data aggregated in the Salesforce system. Data can also be enriched with collections from Google Analytics, QuickBooks and Zendesk. Thanks to the tools offered by the InsightSquared website, you can get sales plan analysis, stream flow visualization and marketing reports.

**Canopy Labs:** It offers services to help in forecasting sales trends and customer behaviour. It offers many scenarios, according to which clients can model their efforts on the marketing and promotional side. For example: whether to focus on regular customers or those who have not made a purchase for some time.

**Tranzlogic:** This is obvious that credit card transactions are chock full of priceless information. Although access was once limited to companies with significant resources, customer intelligence company Tranzlogic makes this information available to small businesses without the big business budget. Tranzlogic works with merchants and payment systems to elicit and analyse proprietary data from credit card purchases. This data can then be applied to quantify sales performance, evaluate customers and customer segments, improve promotions and loyalty plans, launch more-efficient marketing campaigns, write better business plans, and perform other labours that contribute to smarter business decisions. Moreover, Tranzlogic require no technical skills. It is a turnkey program, implying that there is no facility or programming needed (Hisham Safadi, 2017).

**Qualtrics:** Big Data also reaches the websites examining the clients' moods. In this also those that ask users through various surveys on websites: what else can we improve? The analysis offered by Qualtrics enables defining marketing and product objectives, testing various types of advertising messages.

**Sales Manago:** A Polish company that offers marketing automation services. It supports companies of all sizes: from one-person micro enterprises to corporations. The offer includes automatic creation of dynamic commercial offers, monitoring of e-mails or dynamization of content on websites.

#### 1.4 Requirements of SMEs for Big Data

**Flexibility:** Most Big Data solutions are targeted at large enterprises and are typically required customers to replace their existing systems. This means a heavy upfront cost and disruption to the business. For most SMEs this is simply a burden that they are unwilling, and even unable, to take. Any solution for an SME must allow them to choose only the capabilities that they need and integrate them with the systems that they already have in place.

**Deployment Simplicity:** The most common method of deployment of Big Data solutions for enterprise customers involves months or even years of deployment, integration and training. In the case of SMEs this process should take only a few days or weeks as they simply don't have

the resources to absorb the disruption such a process could inflict on their business. The main reason that an SME can expect a solution deployment to be fairly rapid compared to larger organizations is that if done correctly the solution has been integrated with their current systems. In this way, they can benefit from the technology that has been implemented, but with the familiarity of what they are used to using. Furthermore, any bespoke solution will have been designed and built with the input of the SME at every stage. This means that the final system will be closer to what the organization wants and needs than a costly pre-made enterprise solution would be.

**Falling costs of Technology:** For an SME it is essential that they only pay for the features that they need. Furthermore, any licensing should be scalable, allowing for increased capabilities in line with analytic needs. With the falling costs of technology, it is now possible for smaller organizations to benefit from the data insights that larger enterprises have been enjoying. Data sources themselves are becoming more common and cost effective as an SME now not only has access to its own data but also, many times free, data from government databases and social networks. With the costs coming down in the technology used to store data even specialist providers are able to offer better price plans. Even if the data an SME has is not that big and they don't have all of the resources that large companies do then they are still able to benefit from Machine Learning and Big Data analytics to gain insights into their business, customers and key performance Indicators (KPI).

**Increased Competitiveness:** In the early days of Big Data analytics and Machine Learning it was only really the larger organizations with seemingly endless resources that could take advantage of this technology. However, now that SMEs are able to tap into this wealth of knowledge too, then they can position themselves with a more competitive outlook. Being one of the first SMEs to successfully introduce Big Data analytics and Machine learning techniques such as analysing customer traffic patterns, not just from your own data, but also from industry wide data, will help your business become more competitive. Through Big Data technologies SMEs can eliminate inefficiencies and human bias from their business and in doing so strengthen client relationships and enriching service or product offerings.

**Reclaiming Time:** For small businesses, it is often the case that the business owner is the busiest person who has to rely mostly on instinct to make decisions. However, with the use of Data Science it is now possible for business owners to have access to a wealth of information that can help them to make the data driven decisions that need to be made in today's marketplace; without the need to have a team of Business Intelligence experts on staff. It is well known that in the not too distance future Artificial Intelligence and Machine Learning will eliminate some kinds of jobs. Whereas, it could be the case that it will make other types of jobs easier to do. For example, accounting teams are now able to navigate through financial data much faster and make sense of the numbers. It is even possible today to use Machine Learning to free up some time in different roles such as accountants and small business owners, allowing them to work on another task that require more human interaction than a machine can provide.

## **1.5 The framework of Big Data Implementation in SMEs.**

In this part the framework of implementing Big Data in SMEs has been presented.

### **1.5.1 Determining the purpose of data analysis before analysing.**

Small and medium-sized enterprises have to think about its purpose. With a limited budget, we must first ask the right questions so that the analysis is focused on finding the right answers for them. Perhaps the idea is to whether increase sales to a specific group of clients, professional group or specific age category? Maybe, we want to reduce costs or increase the effectiveness of marketing campaigns? Or maybe the point is to reduce costs through in-depth analysis that do not translate into expected results?



### **1.5.2 Identification of ICT system**

At this stage, the project task is determined as a result of an inventory of the needs of future users in the use of Big Data technology. The assumed goals are compared to the organizational, technical and financial possibilities of their fulfilment.

### **1.5.3 Acquiring reliable data**

Data analysis for small and medium-sized enterprises must meet two basic criteria: it must be cheap - both from the data collection and analysis side; it must rely as much as possible on data that already, somehow reaches the organization and supplement it with new data sources, gradually minimizing costs. It is worth noting that small and medium-sized enterprises have - contrary to appearances - a large amount of data, however, these data are not usually analyzed and associated with data from other sources, even within the same company. We can obtain the information we need from the company's systems, sheets maintained by the company, external data, such as Google Analytics or Facebook Insight - says Wojciech Kryński from Ground Frost. Examples of data that a company can collect as part of daily activities are: conversations about the company's products / services in social media and their relationship with shopping trends; visits to websites, the flow of visits between the parties, sources of visits; comparison of marketing campaigns with their effect on the website and in social media; analysis of complaints / queries / customer resignations; data from CRM systems, sales, sales networks; HR data on employees' performance or retention; accounting data on income and expenses, and their types. Even if a small company alone is not able to obtain enough data to capture trends, it is possible to compare the data obtained with information from other small companies to discover patterns of behaviour and expectations of customers in a given industry.

### **1.5.4 Big Data Transformation**

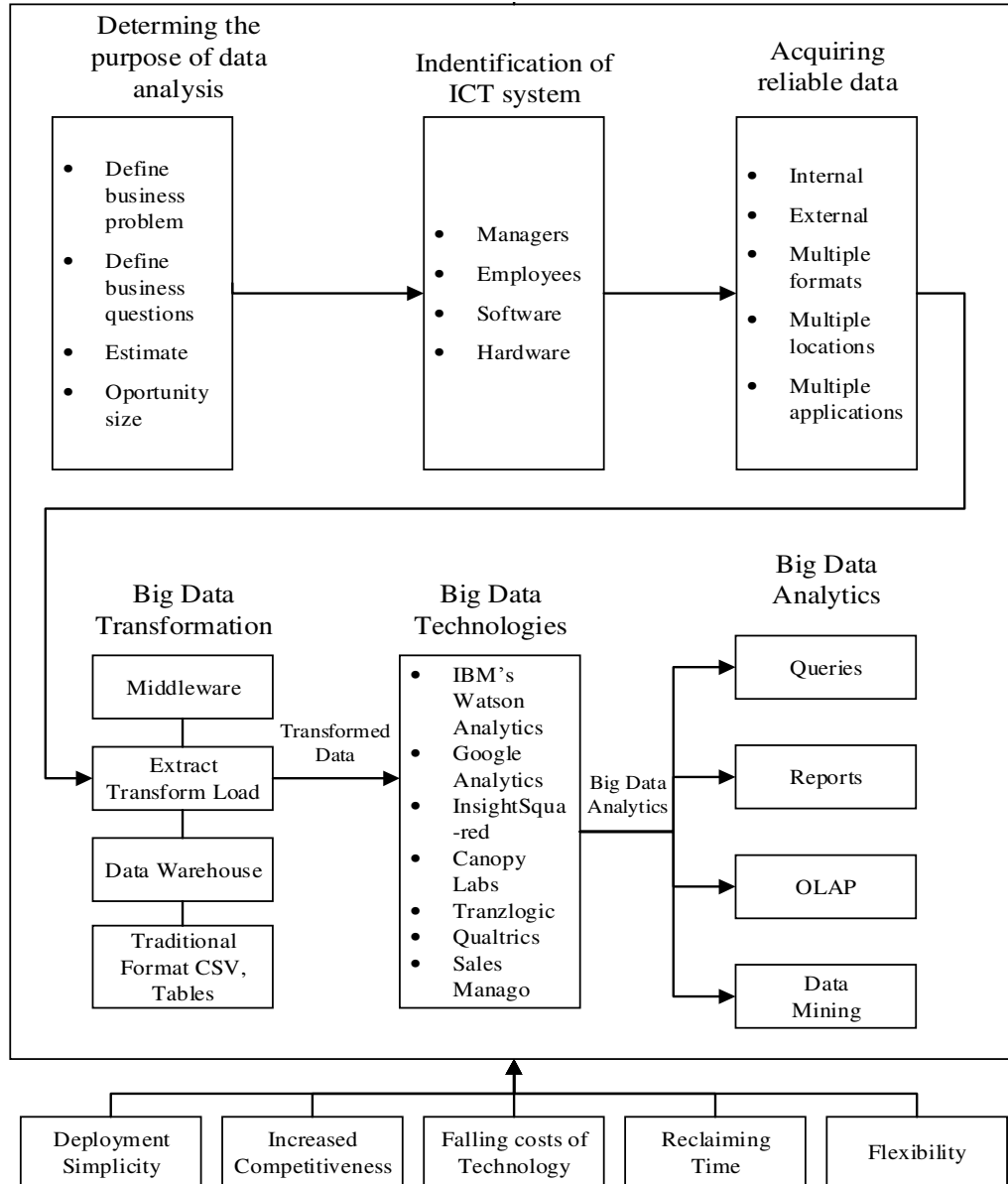
The data is still in a raw state and needs to be transformed. Here, several options are available. A service-oriented architectural approach combined with web services (middleware) is one possibility. The data continues to be in the same state, and services are used to call, retrieve, and process the data.

### **1.5.5 Big Data technologies**

Big Data technology is associated with the size of data sets, the speed of new inflows and their wide variety. Thus, data are difficult to analyse and inference. There are new challenges for companies dealing with the development of this technology. Answers the challenges are, among other possibilities of solutions like: IBM's Watson Analytics, Google Analytics, InsightSquared, Canopy Labs, Tranzlogic, Qualtrics, Sales Manago which have been presented above.

### **1.5.6 Big Data Analysis**

Data connection and analysis can be performed in many ways - through spreadsheets, databases created for this purpose or by specialized applications available on the market. It all depends on the complexity of the necessary analysis and potential referential benefits. It is worth noting, however, that data analysis is an effective tool for building a competitive advantage only if it is a continuous process. Examples of the largest companies in the world - Facebook, Google and Walmart - confirm that this technique works only at the moment when it will be permanently implemented in the company's operations. How does the use of data analysis affect our business? Having hard data about customers, the relationship between revenues and costs, the effectiveness of promotional efforts and the effectiveness of sellers will completely change the nature of the decisions made. In the decision-making process the uncertainty factor is eliminated, and the choices are dictated by reliable knowledge, not by random opinions. By understanding the patterns of customer behaviour, the company is able to educate employees so that they can respond to specific trends (Kryński, 2017).



**Requirements of SMEs for Big Data**

**Figure 3. The framework of Big Data Implementation in SMEs**, own elaboration based on (Wullianallur Raghupathi, Viju Raghupathi, 2014)

**1.6 Issues faced by SMEs related to Big Data implementation in India and Poland**

**Unavailability of modern and affordable technology:**

In an increasingly complex and competitive economic landscape, the need to align people, processes and technology is stronger than ever. Latest technology can help enterprises reduce cost and time taken to innovate and offer sophisticated products and services. This helps SMEs differentiate from peers, optimize cost structures and most importantly compete on a global level with other corporate giants. However, SMEs in India face multiple struggles on account by accessing and using the latest technological advancements. While knowledge, access and funds continue to hamper the implementation of technology, the absence of an ecosystem that enables technology transfer and interaction with experts is a critical reason of limited adoption.

**Slower in adopting technology vis-à-vis large enterprises:**

But beyond government support, etc., another reason is that unlike large enterprises where technology is at the heart of business, Indian SMEs have been slower to adopt technology. R Chandrasekhar, President of India's IT/ITeS association NASSCOM explains: "SMBs face significant challenges in the volatile business environment and global competition. Technology is an enabler that can pave the way for being competitive, drive growth and integrate with global supply chains."

**Lack of knowledge of new technology:**

Lack of knowledge is an inhibitor to adoption of technology, and especially in Tier 2 and 3 cities. And of course, the high cost is another factor, and again this is perceived more in Tier 2 and 3 cities as a key challenge for active adoption of technology in business (Firstbiz, 2014).

**2 FUTURE WORK**

The market of modern solutions enabling Bid Data analysis is constantly evolving. Research indicates the growing importance of mobile BI tools and Business Intelligence systems provided in the cloud model. In addition to the above-mentioned areas, further Big Data studies may address issues review of the practical possibilities of using large data from point view of achieving specific business goals. The following figure may also help to indicate the direction of future research. See Figure 5.

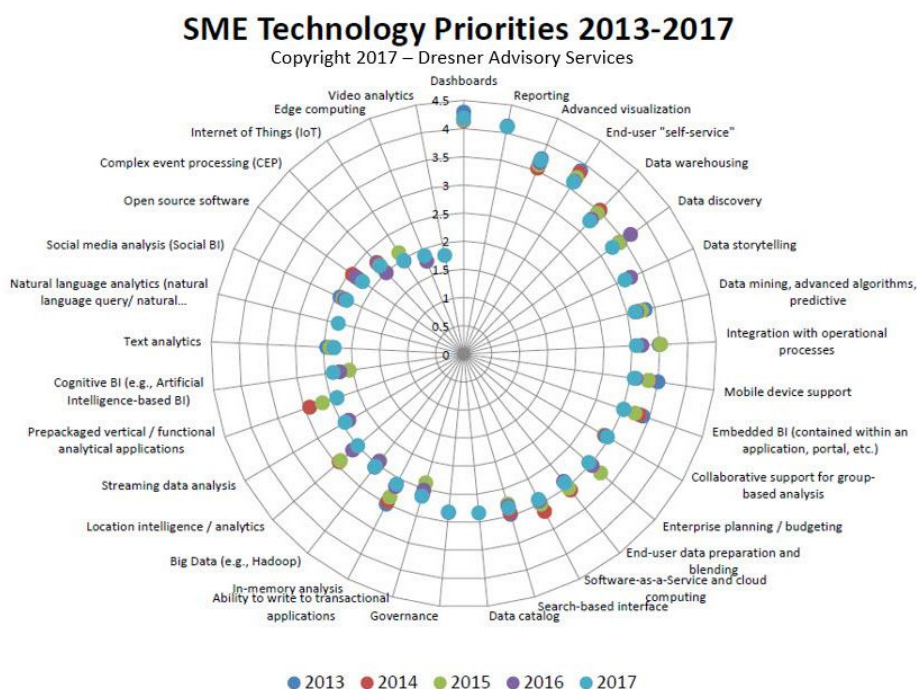


Figure 5. SME technology priorities 2013-2017, (Columbus, 2017)

**5. CONCLUSION**

Big Data could end up widening the divide between large corporations and SMEs with the former gaining advantage through insight. That being said, with the right strategy and solution in place Big Data is both affordable and manageable for the small business owner. The opportunities of Big Data for startups have been shown by firms like other who have used the competitive advantage they gained not only become a large player but also ultimately create a whole new business model and market segment to operate in.

Implementing a data strategy is vital for an SME in today's world where new breeds of technology mean that data generation levels will see new highs. If an established SME is not thinking about this issue, then they need to start now before newer startups and larger corporations surge ahead. For every organization, the ability to correctly predict the future is the key to sustainable growth and Data Science and its related technologies can help businesses of any size achieve that. In the past it has taken considerable computing power and expensive technologies to extract value for data in this way, but advancements in technology and reductions in price mean that now even SMEs can tap into the advantages that Big Data and Machine Learning offer to improve their customer experiences and increase their bottom lines.

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