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Review of Big Data in Finland

International Business

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ABSTRACT

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The object of this thesis is to introduce big data in practice in business. Big data has transformed the main concept of business with big data analysis. Big data analysis allow companies overview their sales and results in real time instead of monthly period of time and this gives huge asset for the competition.

The theoretical part of this thesis base on definitions of big data, the controversial opinions of it. Theoretical part also outline practical examples of how big data analysis have been utilized in practice in business.

The research questions of this thesis is the definitions of big data and how big data have been utilized in practice in businesses. Another research question is that how big data and digitalization have affected the competition in business.

The research method of this thesis is desktop survey method. The main sources for this thesis are internet, articles from newspapers and magazines and book. In this era of digitalization, information is available in internet.

TIIVISTELMÄ

Tekijä: Starck-Baaj Marja

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Asiasanat: Big data, data analyysi, digitalisaatio, massa data, kilpailukyky

Tämä opinnäytetyö tuo esiin big datan hyödyllisyyden yritystoiminnassa. Big data on muuttanut ja tulee muuttamaan merkittävästi yritysten toimintatapoja.
Tämä opinnäytetyö keskittyy osoittamaan millä tavoin yritykset ovat jo hyödyntäneet big dataa ja miten se tulee vaikuttamaan yritysten kilpailukykyyn. Reaaliaikainen tuotannon ja tulosten seuranta mahdollistaa nopean reagoinnin ongelmakohtiin ja muodostaa erittäin vahvan tekijän yritysten kilpailukyvylle.

Opinnäytetyö luo yleiskuvauksen siitä, mikä on Suomen tilanne big data ilmiössä, miten yrittäjät näkevät big datan tuomat mahdollisuudet ja uhat sekä millaisia linjauksia Suomen liikenne- ja viestintäministeriö on big datasta tehnyt.

Teoriaosuudessa käydään läpi big datan määritelmät, mitä se on, mistä se koostuu ja miksi se on niin merkityksellinen. Teoriaosuudessa tutkitaan miten big dataa on hyödynnetty yritystoiminnassa käytännön tasolla konkreettisin esimerkein. Teoriaosuudessa myös käsitellään digitalisaation myötä muuttunutta yritysten kilpailukykyä.

Tutkimusongelmat ovat big datan analysointi, analysoitavan datan erotteleminen ja lähestymistavat kilpailukykyyn vaikuttaviin tekijöihin.

Opinnäytetyö on tehty nettitutkimuksena ja tiedot on kerätty pääasiassa internetistä, artikkeleista ja kirjasta. Tänä digitalisaation aikakautena lähes kaikki tieto löytyy internetistä.

CONTENTS

1 INTRODUCTION

Big data, the evolution of business.

We are living in an era of digitalization, where information is everywhere and achievable for everyone. The usage of technology is a vital condition. The utilization of the big data is a critical factor for the rise of our economy and invigorate our culture. New technologies together with new innovation and skills enable the continuation of information society. Digitalization has merged the people of the world together. Digitalization has created the real globalization.

This work will give an easily understandable overview of what big data is and by examples point out how big data is being used at practical level, focusing on big data's value for businesses.

The subject for this thesis was chosen because big data is a new phenomenon and it will change the traditional way of doing business by utilization of big data. Big data analysis creates new business opportunities and changes the overview of the business functions. Being up to date, is the key factor in successful business, and seeing the business as a whole can give insights that creates huge development. Big data also gives the possibility to highly personalize the customer experience. There are lots of discussions and controversial opinions about big data, but common for all is that big data will affect all of us and it will change the traditional concept of business. In the near future big data will be the same as competitiveness for companies and big data analysis will be one of the most important aspects of the business concept.

Digital orientation, big data analysis and Finland's know how on high technology and engineering has a huge potential for improve Finland's economy.

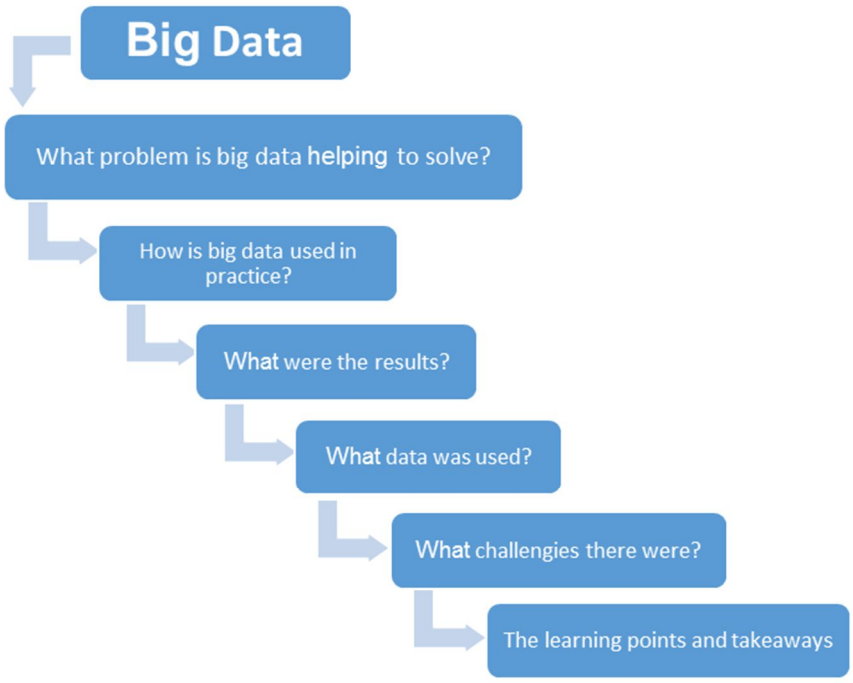
The objective of this thesis is to define and draw outline of big data and to bring forth the importance of big data. The thesis also presents how the big data can be utilized for creating value for business and what problems it has solved.

This thesis will review big data in Finland and what strategic guidelines Finland Ministry of Transport and Communication have determined.

The theoretical background of the thesis is based on current knowledge of big data. Definitions of big data will be studied to get a perception of big data. The theoretical background will also be based on official reports by Finland Ministry of Transport and Communication, and Finland Ministry of Economic Affairs and Employment. Research problems for this thesis are to find out what and how big data has been utilized to create value for business and how big data have transformed the business competition. The importance of utilizing big data is to know which data is essential to be collected and analyzed. This is both, a huge challenge and opportunity for companies.

2 RESEARCH PROBLEMS AND RESEARCH METHODS

The research problem of this thesis tried to find out how to utilize big data and to get insights from it. The main research problem is how to use big data analytics to improve competitiveness. The picture below (Graph 1)shows the research questions that were used to discover how big data is used in practice in businesses. (Marr,2016)



Graph 1. The implementation of big data and big data analysis.

The research method that was used in this thesis was desktop research method. Because of the big amount of available information online, it was important to be

able to filter the right information and to have critical media reading skills. Information has been gathered mainly from internet: online interviews, articles, books and international and national news and articles from magazine. Source of information was also the official reports by Finland Ministry of Transport and Communication, and Finland Ministry of Economic Affairs and Employment. Recently published books and the latest news has been up to date source for this work. The character of the subject requires latest information and in this digitalized world the main source of information is the internet.

3 BIG DATA

Big data is large and complex sets of data that have been existing for a long time, for decades (Finlay 2014).

Big data is huge amount of data created every second (Marr 2016).

To be able to describe big data, it is more coherent to describe from where the data originates from.

Generally everything we do digitally will leave a data trail. In the last two years we have created more data than ever before in the history, and it is increasing rapidly. In fact, it is predicted that by year 2020, 1,7 megabytes of new data will be created every second, for every human being on this planet. (To describe the amount of data better, one normal digital photo size is 0.3 mega-bytes, so it would be a few pictures per person per second.) This data consists among other things from messages, emails, different applications like What's up, Facebook, Twitter, digital photos and videos, all the sensors we have around us. The sensors are for example GPS (Global Positioning System), Barometer (weather measurement), accelerometer (how fast we are moving), touch sensor (by what force we touch our touch screens) just to mention a few of them. There are estimations that by year 2020 we will have over 50 billion devices that are connected to the internet. (Marr 2016, 2)

It is difficult to understand the huge amount of that data created every second and the accelerating speed of that aggregating data. Hence we can now collect and analyze data that was impossible years ago and because we now have more data and the fact that we can analyze any data gives unlimited opportunities for businesses to increase their competitiveness. (Marr 2016, 2-3)

Digitalization has revolutionized the business concepts. Digitalization has brought new ways to operate and new operators. For example, the biggest service provider of the accommodations, Airbnb, has no hotels. (Välimäki 2015)

Airbnb is a community marketplace, where all the people can list, and book accommodations around the world online by using a mobile or tablet. Airbnb connects people in more than 34 000 cities and 191 countries and gives people possibility to earn some extra money by renting their extra living space. The genius idea is that you only need to register and download the application for your mobile or tablet and you are ready to operate. (Airbnb, About us.)

And the world's biggest taxi service provider Uber, has no taxies at all. (Välimäki 2015.) Uber is a taxi booking service smartphone application, that is based on a simple idea, tap a button and get a transportation. Uber is an application that represents a flexible way to earn money. Uber improves access to transportation and increases safety on streets by reducing the taxi waiting time. (Uber 2016).

3.1 Definition of big data

The importance of big data in the business world and big data as a value factor for rising economy is commonly understood, but there are contradictions of the big data definitions. This conflicting understanding of big data concept is reducing the speed of development of interoperability. (Tieke.)

There are several definitions about big data, probably the most well-known definition is known as three Vs: *Volume*, *Velocity* and *Variety* (SAS Big data).

Volume stands for the huge amount of transaction-based data stored through the years. The data comes from variable sources, for example social media, sensors and machine-to-machine. Before the problem was how to store the increasing volume of this data, but because the costs of storing data decreased, other issues came up, issues like how to determine which data is most relevant to be analyzed for creating value. (SAS Big data.)

Velocity stands for the unforeseen speed of data streaming. Organizations should be able to deal with it quickly, preferably as real-time as possible. (SAS Big data.)

Variety means that data comes in many different types of formats. For example, text documents, email, video, audio, financial transaction and all different kind of applications. Managing, merging and governing this data is a huge challenge for many organizations. (SAS Big data.)

There are two other definitions of big data as well, *Veracity* and *Volatility*. The definitions are the following:

Veracity is the quality of the data; is the data valuable and meaningful in relation to the problem that needs to be resolved (Big data -määritelmä 2016).

Volatility stands for essentiality; for how long the data is essential and useful (Big data -määritelmä 2016).

3.2 SWOT Analysis of big data

SWOT-analysis of big data is made in perception of small and medium size companies, but applies for bigger companies as well. Often big companies and corporations have more capacity and resources to structure all the required changes for utilizing big data to bring value for business. For small and medium size companies need to consider carefully, and use the right advisory for big data analysis, in order not to waist the resources, for example, for collecting and analyzing useless data.

SWOT-analysis:

- Strengths

- capacity of data, the data is out there for everyone
- analysis of enormous amount of data
- enables predicting
- increasing security with effective observation in real-time
- real-time tracking which enables fast respond to the problems

- Weaknesses

- velocity of data, new data becomes old data fast
- variety of data, difficulties to sort out the essential data to analyze
- infrastructure not capable yet to respond the demand
- relying only on data instead for example on instinct and intuition
- requires more resources like new skilled workers and new technology
- difficulties to find agents for helping companies to use big data

- Opportunities

- opportunities for new innovations and businesses

- increased value for business by real time data access

- better working environment by improved flow of information and response

- enhancing development by creating insights

- Threats

- wrong data analyzed causing waste of resources

- privacy and cyber-security issues

- cultural and political obstacles

- no anonymousness

- creativity and problem solving skills decreasing (Major hurdles in big data 2014)

From this SWOT-analysis it can be seen that there are most factors under weaknesses. If this analysis had been made by focusing on big companies and corporations, the results would have been different. From this analysis can be noticed that utilizing big data requires extra recourses, but investing on big data will bring benefits in long term.

4 BIG DATA IN PRACTISE

Walmart Senior Statistical Analyst Naveen Peddamail has said “If you can´t get insights until you have analyzed your sales for a week or a month, then you have lost sales within that time.” (Marr 2016, 6)

Big data analysis has become one of the most essential tools for many companies regarding competitiveness to gain better position on the markets. Big data analysis has also enabled very effective and precise predictive analytics. Predicting customer behavior allows companies to orient marketing more precisely, with the intention to market the right products to the right people in the right place at the right time, which is a very basic principle of commerce.

On the other hand, most of the companies lack the knowledge of utilizing big data in practice and what kind of things can be built around big data. Big data needs to be introduced to companies in order to make them realize the large variety of possible benefits and new opportunities it has to offer. There are many service providers that help companies to gather information about their audience in order to enhance the customer experience. (Enreach 2015.)

In retailing, supermarkets are the ideal examples of how big data and big data analytics can create value for businesses. Walmart, the largest retailer in the world is a good example of how big data was used to improve sales and how it brought insight and development. (Marr 2016, 10.)

4.1 Example of how Walmart used big data

Walmart started as a small single discount store with a concept of selling more for less. Now Walmart is the largest retailer in the world, having almost 260 million customers, more than 11 500 stores in 28 countries and e-commerce sites in 11 countries. (Walmart, about us. 2016.)

Walmart is an excellent example of how big data analysis has been used as a great advantage and became one of the essential factor of their business concept. (Marr 2016, 5-10.)

When the hurricane Sandy in 2004 hit the United States, they discovered that if data was studied as a whole instead of individual sets, unexpected insights would appear. After studying the statistics of the sales during hurricane Sandy, it was discovered that during expected bad weather, the sales of strawberry Pop Tarts went up. As a result, when hurricane Frances was forecast in 2012, Walmart ordered extra amount of strawberry Pop Tarts and as expected, they sold extremely well. Since then Walmart have grown their Big Data and analytics department considerably. (Marr 2016, 5-10.)

In this case big data was helping to solve the common problem in this highly competitive industry of supermarkets, which is logistics. The logistics problem in supermarkets are to find out how to offer the right products, in the right place, at the right time, for the right consumers. Consumers prefer to find all they need under the same roof. (Marr 2016, 5-10.)

The practical steps that needed to be done were to create a section dedicated only for the big data analytics. In 2011, Walmart established a department and a team called @Walmart labs and Fast Big Data Team to research and deploy new data-led initiatives across Walmart's business. (Marr 2016, 6.)

In Walmart's headquarters in Bentonville, Arkansas is located the Data Café, a state-of-the-art analytics hub were the analytics team can monitor 200 streams of internal and external data in real time, including a 40-petabyte (40million giga-

byte) database of all the sales transactions in the previous weeks. (Marr 2016, 6.)

Walmart created three different projects to monitor people's social media behavior and to predict what people will buy. The Social Genome Project, the purpose of which is to monitor public social media conversations. Based on the collected data, the Social Genome Project gives predictions of what people will buy. They also created a service called Shopycat which uses social media to predict how peoples shopping habits are influenced by their friends. And they created their own search engine, Polaris, which analyzes what products customers search on Walmart's websites. (Marr 2016, 7.)

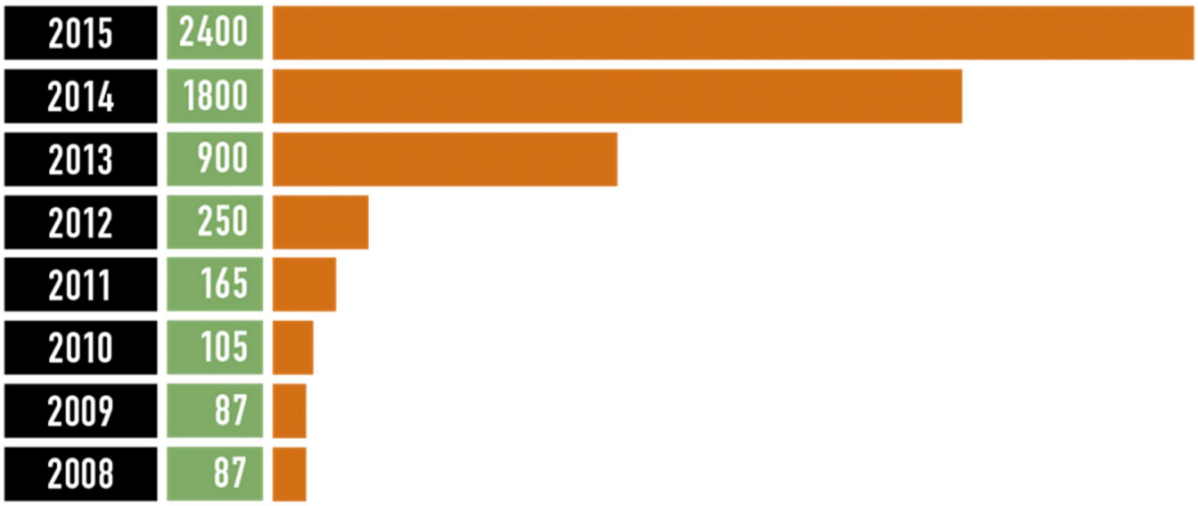
The results of adapting big data were significant. Significant development of Data Café were that the reaction time for spotted problems decreased dramatically. The time from finding the problem to having it fixed, decreased from two to three weeks to 20 minutes. A good example for this is when during Halloween, a new cookie was launched for sale. When the analysist monitored the sales of novelty cookies, they noticed that in several Walmart stores the cookies were not selling at all. After contacting the merchandizing teams responsible for the stores, they realized that the cookies had not even been put on the shelves. This example points out how the big data analysis can be used in different ways. (Marr 2016, 5-10.)

4.2 Game industry, Pokémon Go-game

In today's fast developing technology where new innovations are waiting to be discovered, it is very important to be up to date with the progress. A good example of today's changing business environment is the game industry. The game industry is the latest success story and Finland is a part of it. (Neogames 2016.)

The game industry is the fastest growing branch in the entertainment business. The estimated video game sales globally in the year 2015 were about 92 billion dollars and it is estimated that they will reach more than 100 billion by the year 2017. (Neogames 2016.)

The game industry has become an essential part of the export industry of Finnish culture. Because of the limited markets of Finland, over 95 percent of the production of the game industry is exported. This demonstrates that the game industry is notable for the national economy of Finland. Neogames is a Finnish game association, which is promoting the benefits of the game industry. The growth of revenues of the game industry (Graph 2)in Finland has been fast. Neogames evaluates that the revenues of the main game industry in Finland in 2015 was about 2,4 billion euros. This is about 25 percent of the total revenues of the whole ICT sector in Finland. (Neogames 2016.)



Graph 2. The rapid growth of revenues of the game industry in Finland. (Neogames 2016.)

A good example of this fast developing and changing game industry is the lately released game, Pokémon Go. Pokémon Go is a game developed by Niantic to Nintendo Corporate. Nintendo Corporate is a Japanese multinational consumer

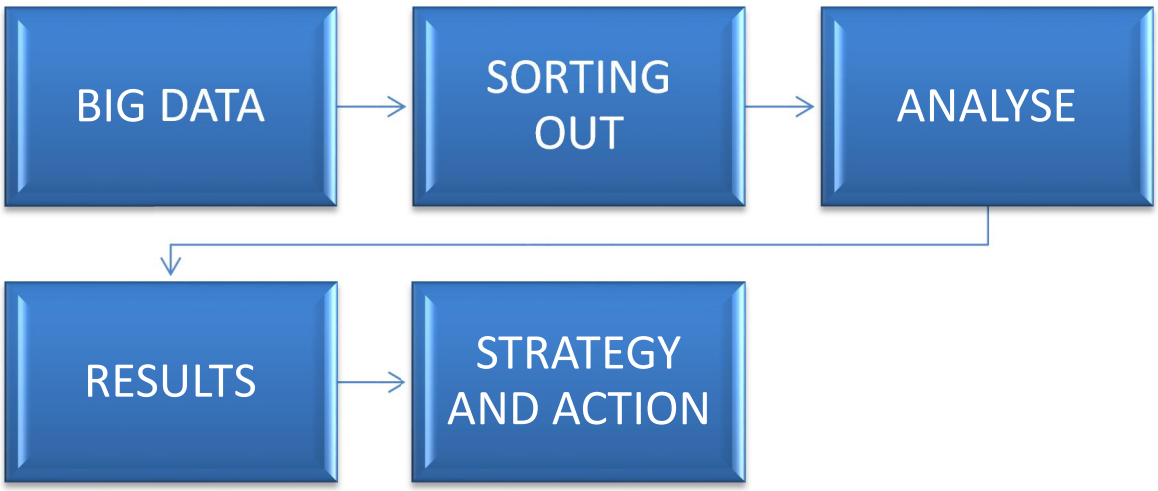
electronics and software company. Nintendo is one of the biggest video game companies in the world. (Pitkänen 2016.)

Pokémon Go game is mixing the virtual and the real world in a clever way. Right after the game was launched, it became a huge phenomenon around the world. People everywhere were out on the streets and parks catching all the different Pokémon with their mobile phones. This game can be downloaded for free and played for free. It is possible to buy digital features in-game to help you catch Pokémon more easily. Surprisingly even players who do not normally use money on mobile games, did so with this game. In the game there are Pokestop and PokeGym places that help players catch Pokémon if players are around these areas. McDonald´s (huge international hamburger restaurant chain), realized the opportunity this game had. McDonald´s made a contract with Niantic about locating these Pokestop and PokeGym places into its 3000 hamburger restaurants in Japan. After this deal was announced to the world, the shares of McDonald´s started to rise immediately (Pitkänen 2016).

In Finland, an electronics store, Gigantti, realized that Pokémon Go game is based on GPS positioning system and consumes a lot of power which causes the battery of mobile devices to run out fast. Gigantti targeted only one add to the Pokemon game players and the sales of extra power source equipment rose 700 percent. (Pitkänen 2016.)

4.3 Big data -analysis

To be able to utilize big data, the meaningful data needs to be found out, in order for the right data to be analyzed.



Graph 3. Big data analysis process.

The picture (Graph 3)above shows the process of big data analysis. There is a huge amount of data collected and stored. The data is useless until the essential and meaningful data that needs to be analyzed is sorted out. Then there is the analysis process itself. When the results are ready, management needs to create a strategy plan and implement the plan into action. After the strategy and action stage there is a follow-up of the total results.

5 BIG DATA AS COMPETITIVE ADVANTAGE

Big data has transformed the way companies compete with each other.

Utilizing big data will be the basis for the competition for businesses by being able to collect and to analyze a large amount of data to identify patterns and to improve decision making. Utilizing big data analysis can also decrease waste and bring more quality for products and services. (Ivey Business Journal 2012.)

The key factor of turning big data into competitive advantage is the predictive analytics (Inside Bigdata 2015).

Predictive analytics has also got a darker side to its brilliancy. The editor of Predictive Analytics Times, Eric Siegel, calls these darker sides as “unvolunteered truths”. Unvolunteered truth in this matter refers to the in-depth predictions that correlates certain products being purchased and unwanted information that this purchase correlates. For example, customers purchasing pregnancy-related products started to receive marketing products and adds of baby- and pregnancy-products. The result was that by marketing those products they revealed information about their customers to the customer’s family members, who were not aware of the pregnancy, and the privacy of customers was jeopardized. It appeared like a smart marketing method based on predictive analysis, but forgot the privacy and delicacy issues. (Target Marketing 2015.)

One of the first predictive analytic tools was the “recommendation engine” -technology, a system that predicts consumer decision making based on previous search or purchase. Overload of information is very challenging for the companies and also for the customers. The confusing amount of too many options, can disrupt the customers purchasing decision. (Marr 2016, 287, 288.)

The predictive analysis is based on the theory that the more the company knows about their customer, the more they can predict what the customer wants to buy. The observation of customers happens by tracking what the customers buy,

what web pages they are looking at, their demographic locations, their feedback and reviews. Observation also goes into more details, it follows at what time customer is browsing internet, how long time is spent in one page and how many internet pages open at the same time. Then this data from a customer is matched with other customer's data to see who have similarities and that way the potential customer groups are made by data analysis and predictive analysis. This method is called 360-degree view of a customer. By offering for a customer the products that the selling company predicts the customer wants to buy, eases out the customer's own decision making process and reduces the customer´s getting confused by overwhelming amount of choices. (Marr 2016, 288, 289, 291.)

When Hillary Clinton, the Democratic Party nominee for The President of the United States in 2016 election (Wikipedia 2016), wore a white pantsuit twice: first when she was accepting the nomination of the Democratic National Committee in July 2016 and the second time she wore the white pantsuit in her last debate with Republican Party nominee for The President of the United States, Donald Trump in October 2016. Generally, pantsuits have been very popular since January 2016 but now the internet search for white pantsuit peaked. Women who wanted to vote for Hillary Clinton, wanted to wear the white pantsuit. The phenomenon of the white pantsuit occurred inside a very short time. Because Hillary Clinton was wearing pantsuit in label of Ralph Lauren, "Ralph Lauren pantsuit"-search in internet peak. When the shoppers found out that, that particular Ralph Lauren suit was custom made, the shoppers started to search for other brands. The brands, that appeared first on search engines, benefitted among the first companies from this phenomenon. (Zaryouni 2016.)

6 BIG DATA IN FINLAND

Utilizing big data requires adequate digital environment and the digital infrastructure. One of the essential operations is to build trust on the internet and on the digital environment. (Finland Ministry of Transport and Communications 2016.)

Finnish Government, Finland Ministry of Transport and Communications is preparing a strategic guideline of big data and My Data (Nordic Model for human-centered personal data management and processing system) for government resolution. The vision is that Finland will be a strong, innovative and reliable data environment where competences generate international business operations. (Finland Ministry of Transport and Communications 2016.)

The guideline is proposing in the future to concentrate on removing the restrictions of data economy development in order to better utilize resources of data. The guideline suggests also the improvements of service infrastructures towards more effective utilization of data. (Finland Ministry of Transport and Communications 2016.)

Information and communications technology (ICT) sector is a significant part of Finland's GDP (gross domestic product). ICT sectors turnover in 2013 was 43,4 billion euros, in which telecommunication companies had 4,5 billion euros, programs, consulting ja information services 7,9 billion euros and production of computers and electrical devices 31 billion euros. Sector is directed to export, end users in ICT sector in Finland in 2014 was 6 billion euros. (Finland Ministry of transport and Communications 2016.)

6.1 Government resolution of big data by Ministry of Transport and Communications

Finland has good potential to become a country where it is safe to take hold of the opportunities that digitalization brings. Developing and offering services based on utilizing digital information, will increase and develop Finland's economy. (Finland Ministry of Transport and Communications 2016.)

The development of information security and progress of markets will enhance Finland's position in the constantly changing world. For Finland to be able to enter and fully compete in the international markets, requires a secured digital independency and would outline Finland's strategic role as a secured and reliable cyber environment. (Finland Ministry of Transport and Communications 2016.)

6.1.1 Aims of the information security strategy

The aims of the information strategy:

- Finland's legislation is supporting the digitalization in the fields of business competitiveness.

- More reliability for the digital internal market of the European Union.

- Finnish companies are benefiting the international standards and there are supply of digital commodities with built in information security.

- Information security and information security know-how is being researched, measured, observed and developed.

- Authorities are helping people and communities for improving information security. (Finland Ministry of Transport and Communications 2016.)

6.2 Impact of big data in Finnish companies

The phenomenon of big data started to rise in Finland at the beginning of the year 2013. At first Finland seemed to warm up slowly for the era of big data, but now many Finnish IT-companies have started to work with big data. One of those companies is Eficode, they offer software services for businesses. Eficode was one of the first companies in Finland that started to work with big data analysis. Since then they have had lots of namely customers like Elisa (Finnish telecommunication provider), Danske Bank (Financial company of Northern Europe) and Yle Areena (Finnish online Broadcasting Company). In spring 2015 Eficode interviewed Finnish companies which already had introduced big data into their businesses. They wanted to know what those companies think about this big data phenomenon. Notable concern was that the companies do not have a clear picture of big data. Big data is seen more as a buzzword, only because people in the companies do not know what to do with it and how to utilize it. Some companies have been taking advantage and gained good results, but those are still the minority. (Eficode 2015.)

Here is a summary of benefits that big data has brought to some Finnish companies.

- responses for operations is faster
- improving the operations by data analysis
- creating new business opportunities
- personalizing huge value for business
- big data becoming democratized
- big data analysis improving the price determination
- phenomenon of opportunity

In utilizing big data, there needs to be a clear strategy for implementing big data analysis:

1. Set the plain goals what a company wants to achieve and put them in a concrete form. For example, decreasing the loss of customers by 2 percent.
2. Recognize the challenges of the flow of information and the culture of the decision making.
3. Describe the problems of the goals and set up the needed data together with the business operator and analysists.
4. Measure the results and implement proof of concept(POC) and analyze the results.
5. Close observation of the operations is very important. (Eficode 2015.)

   Also it is important to take little steps in the beginning and after succeeding, analysis can be extended by using more data sources or change the analyzed focus into different section (Eficode 2015).

6.2.1 Zalando Technology Office in Helsinki

Zalando is a giant e-commerce company that originates from Germany. Zalando e-commerce sells shoes, clothing and other fashion items (Wikipedia 2016). Zalando was founded in 2008, so it is a young company for its size. Zalando operates in 15 European countries and has about 19 million customers. (Zalando 2016.)

Zalando has had such a great success that it has contributed to establishing e-commerce as a relevant economic factor in Germany (Zalando 2016).

Zalando opened their second international technology hub, Zalando Technology Office in Helsinki on 2015. Finnish engineering know-how and the country's good geographical position were the critical factors why Zalando chose Finland. (Helsinki Business Hub 2015.)

Another basis why Zalando chose Finland for the location of their technology office was Finland's reputation as a high tech country. Zalando Head of Tech Expansion, Marc Lamic said that Helsinki was one of the top-of-mind tech destinations. He also says that the startup and mobile scene is thriving here and Zalando wants to be part of it. The Universities in Finland invest strongly on technology which Zalando sees as an advantage for them. Zalando sees local mobile and design expertise and the entrepreneurial spirit as a huge opportunity for e-commerce. (Zalando 2015.)

Zalando Helsinki-team is focusing on connecting people and fashion in many different ways, as well focusing on mobile developing and user experience design (Zalando 2015).

6.3 Small and medium size(SME) enterprises and digital orientation

Ministry of Economic Affairs and Employment of Finland with co-operation with Finnvera Oyj and The Federation of Finnish Enterprises, publishes the Indicator of Enterprises two times annually. This indicator is describing the functions and economic environment of small and medium size enterprises (SME). (Rikama 2015.)

Finnvera is a financing company owned by the State of Finland and it is the official Export Credit Agency of Finland (Finnvera 2015).

Indicator of spring 2015 is based on answers from 4404 representatives from Finnish small and medium size enterprises and is describing comprehensively

how SME perceive the changes of the economic environment where SME companies operate. The indicator describes also what factors are affecting the businesses and the future developments of businesses. (Rikama 2015, 3.)

In this report, a subset of companies that were strongly orientated to digitalization were selected out from the rest of the small and medium size companies. Subset of strongly digitalized companies were categorized in a way that those companies must have used at least five of the following digital tools:

1. Own webpages
2. Social media, for example Facebook
3. Cloud services, online service
4. e-commerce as a sales method (products and services)
5. Company's purchases online (products and services)
6. Usage of digital channels as a distribution of services and in marketing
7. Use of big data, for example in market area analysis
8. Industrial internet, new innovative business solutions in which manufacturing equipment can talk among themselves (Techopedia 2016). (Rikama 2015, 3.)

Companies that were strongly orientated to digitalization in this SME indicator were almost eight percent, which is approximate 18 000 – 19 000 companies in Finland (Rikama 2015, 4).

In this report turned out that usage of digital tools enables access to national and international markets more easily. From the strongly digitalized companies, about 13 percent were operating in international markets and over 50 percent operate in national markets. This points out clear deflection comparing to other small and medium size companies that are not strongly digitalized, from those

companies 60 percent operate mainly in local or regional markets. (Rikama 2015, 6.)

Strongly digitalized companies were also more willing to grow their operations and to increase innovations or the development of products and the production. (Rikama 2015, 7,8).

Report showed that companies that are digitally oriented have more export and are strongly presented in the international markets. SME´s that were strongly digitalized, entered the international markets mainly in European Union countries, other European countries and in Russia. Other international markets seem to have more challenges for small and medium size companies, who might have a lack of specialization of entering the wide international markets. Most of the international markets are highly competitive, and therefore the best possibilities to success in the international markets are for those high ranking Finnish companies that specialize in certain fields of know-how. (Rikama 2015, 11,12.)

Digitalization and the companies which have effective usage of digital tools, seem to be the divider for the Finnish companies. They are also very valuable for the Finnish economy and the leading edge for other companies. (Rikama 2015, 15.)

7 DISCUSSION

All new things naturally cause fear in people, people run businesses and businesses are the core of economics. Is the common fear of the big change slowing down the development and does the fear make stepping into the era of digitalization more slow and decreasing the utilization of big data in business? Although requiring enough of information in understandable form in a convenient period of time should ease out people's fears. And the big data phenomenon can bring welcoming changes to the world.

The big data phenomenon and digitalization has created also a negative aspect among nations, which is fear. The biggest threat is that people feel they are being observed and controlled by the government. It is the kind of perception that decreases the feeling of security and privacy among people. Big data is not actually made for controlling over a nation or as a tool for despotism, even though some believe that might have been the primary purpose of it. Instead it is supporting the democracy, increasing security and enabling problem solution in a variety of areas, from grocery stores up to science.

Information technology and big data has transformed the way of doing business. Data analysts and data scientists are very needed professions, and the need for those professionals in the near future will increase dramatically. In a light of information gathered for this thesis, it seemed like Finland woke up a little late to this new era of big data. This ongoing year 2016 has showed that Finland has sprinted up in this matter. The expertise needed in the future requires a large amount of education providers on this field of study. The whole working environment has changed, instead of individual know-how, we need to work as a team with the same goals. The working environments will need lots of guidance to be able to adapt to these new changes, which is setting new challenges for the management level.

Because information is everywhere these days and the flow of information is very fast, companies are vulnerable in front of all media channels, especially in social media. A good example of how social media affects businesses is when something goes viral on social media, it means that the particular news is everywhere in the world in matter of hours. It is especially harmful when the news is unfavorable for someone's business. Business environment is changing rapidly and it is exposed to different phenomena. To keep up in this rapidly changing business environment, companies need to allocate their recourses on their digital performance.

Examining big data effect on business and competition, has pointed out, that big data has and will distinctly change the traditional business concepts. The possibilities and the insights data analysis can bring seems endless. The development data analysis has brought for industries, like real-time tracking systems on production lines, is a huge development. The way data analysis can personalize customers is a remarkable advantage and gives huge possibilities for companies to improve their businesses. Improving the business environment leads into increase of economy. Big data and big data analysis brings huge development to the world.

What Finland and Finnish people need is a better self-esteem and trust for their own expertise. Finland is known as a high technology country and has excellent engineering skills and know-how which gives Finland a very good opportunity to present as a trustful, reliable and hardworking platform for this new era of big data.

8 CONCLUSIONS

As a conclusion, to be able to utilize big data, the main importance is to understand what data is relevant to be analyzed. This factor is relevant to the size of the company. Naturally big corporations have bigger resources to build up big data analysis departments and recruit the personnel needed. Small and medium sized companies should make big data analysis plans to see how much resources data analysis will take and to realize that it might be the investment needed to boost up the business. It is very important to have right technology and skilled human resources. It requires also the digital infrastructure to be developed by the Finnish government in order for digitalization and digital technology to function properly, it makes big data a part of governmental interference.

Nevertheless, digitalization is on its way and big data with it will chance something in people's everyday lives and when people's everyday life changes, naturally their purchasing behavior, consumption and needs change as well. Entrepreneurs must follow the times and keep up with them, even better to be a bit ahead. The old proverb that describes the core of business:" first to come, first to be served" applies in big data perfectly because analysis of big data gives possibility to predict the markets.

Essential also is that by the big data analysis the reacting and responding time is degreasing significantly which improves the functionality as a whole in business.

General knowledge of big data is not enough; entrepreneurs have to understand how big data will transform the business concepts. Before you can analyze collected data, you must have a good knowledge about the particular targeted area of business. Which creates new professional fields, the field of analytics, and analysts who are specialized on certain fields. It requires new fields of education which requires changes in the educational system in Finland. Big data is changing practically everything in our lives.

Even those who are seeing big data as a buzzword and just a phenomenon that will fade away, they can't deny the fact that digitalizing will not stop or go backwards and big data is the actual part of digitalization and development of civilization.

As a point of view of small and medium sized companies, for them to be able to fully utilize big data and big data analysis, requires big resources which small and medium sized companies might not have. In order to success companies must react immediately to the changing world. Business is in transformation and all the traditional business theories are on the line. Big data is available and it is everywhere for everyone, business wise, big data just needs to be properly analyzed and correctly utilized.

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