THE REPUBLIC OF TURKEY
BAHCESEHIR UNIVERSITY

BIG DATA ANALYSIS IN DIGITAL MARKETING

Master's Thesis

SERDA KASACI YILDIRIM

ISTANBUL, 2020

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ABSTRACT

BIG DATA ANALYSIS IN DIGITAL MARKETING

Serda Kasacı Yıldırım

Master's of Business Administration

Thesis Advisor: Prof. Dr. Figen Yıldırım

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Companies collect, organize, digitalize, segment data and then predict to understand customers' needs, wants and behaviors by using big data. Market segment is a group of personas or organizations, who have similiar interest, preferences, needs, wants and expectations. Organizations segment their customers in order to communicate in a correct way, build better relationship with customers, fulfill their requirements effectively, develop successful products and services, and increase the profitability.

In this study, big data usage in digital marketing is analyzed from the different industries points of view, including building automation, shoe manufacturer and photography. As data collection method, in-depth personal interview was selected and three interviews were conducted with three different companies. The results are analyzed from B2B and B2C marketing points of view and there were found similarities and differences in their marketing activities which were analyzed in detail. All companies use big data, investigate and collect customer data on their web sites by performing segmentation in order to communicate more effectively. Product development strategies of the companies, and also social media interactions are also different.

This thesis could be used as a reference to see how big data is integrated and used in different industries.

Keywords: Big Data, Digital Marketing, Customer Segmentation, B2B, B2C

ÖZET

BÜYÜK VERİNİN DİGİTAL PAZARLAMADA ANALİZİ

Serda Kasacı Yıldırım

İşletme Yüksek Lisans Programı

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Büyük veri sayesinde işletmeler çeşitli verileri toplayarak, bu verileri düzenleyerek ve dijitalleştirilerek, müşteri ihtiyaçlarını ve davranışlarını anlamada tahminler yapabilir ve bu verilerden yola çıkarak müşterileri farklı gruplara ayırarak, onlarla daha iyi bir iletişim kurup, ilişkilerini güçlendirerek, onların ihtiyaçlarını daha etkili bir şekilde karşılayarak, müşterilere bu veriler sayesinde daha başarılı ürün ve servisler sunup, organizasyonun verimliliğini arttırırlar.

Bu çalışmada büyük verinin dijital pazarlamada analizi farklı endüstriler açısıdan yapılarak, bina otomasyon sistemi, ayakkabı üreticisi ve fotoğraf endüstrilerinin gösterdikleri farklılıklar incelenmiştir. Veri toplama yöntemi olarak mülakat tekniği kullanılmış ve üç farklı firma ile görüşülmüştür. Mülakat verilerinin analizi ile "Firmadan Firmaya" ve "Firmadan Tüketiciye" pazarlama tekniklerinde benzerlikler ve farklılıklar görülmüş ve analiz edilmiştir. Firmalar büyük veriyi tutarak, web sitelerinden müşteri verileri toplayarak, tutulan veriyi kategorilere ayırarak, müşteri ile daha efektif iletişim kurmaktadırlar. Firmaların ürün geliştirme politikaları farklılık göstererek, sosyal medya iletişimleri de farklıdır.

Bu tez, büyük verinin dijital pazarlamada kullanılması için bir referans olup, büyük verinin dijital pazarlama ile farklı endüstrilerdeki kullanımı hakkında bilgi vermektedir.

Anahtar Kelimeler: Büyük Veri, Dijital Pazarlama, Kullanıcı Segmentasyonu, Firmadan Firmaya, Firmadan Tüketiciye

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ABBREVIATIONS

AMA   : American Marketing Association

AI   : Artifical Intelligence

AR   : Augmented reality

B2B   : Business to Business

B2C   : Business to Csutomer

CTR   : Click-through-rates

CRM   : Customer Relationship Management

EMR   : Ethnographic Market Research

GB   : Gigabytes

GPS   : Global Positioning System

IMC   : Integrated Marketing Communication

MDSS : Marketing Decision Support System

MIS   : Management Information System

MKIS   : Marketing Information System

MMS   : Multimedia Message Service

PPC   : Pay-Per-Click

SEO   : Search Engine Optimization

SERP   : Search Engine Results Page

SMART : Specific, Measurable, Actionable, Relevant, Timely

SMM   : Social Media Marketing

SMS   : Short Message Service

STP   : Segmentation, Targeting and Positioning

QR   : Quick Response

TB   : Terabytes

UGC   : User Generated Content

VR   : Virtual Reality

VOC   : Voice of Customers

1. INTRODUCTION

Digital marketing is the marketing of products and services over the digital media. The advantage of internet created new opportunities for marketing. With the rise of digital technologies, customers expect from the companies to create more relationship with them, by fulfilling their requirements. They also want companies to understand their needs and wants. (Kotler et al. 2012).

Big data is used for capturing, storing, managing, analyzing and processing the hugh amount of data which is too complex to be processed by any traditional database management system. Therefore, enterprises require big data platform to keep much more about the customers and segment them more wisely. Customer segmentation is dividing customers into groups who similar preferences, needs and wants. By using big data, companies can segment their customers more accurately and wisely and perform their digital marketing activities more efficiently.

The topic of this study is to analyze the big data usage in digital marketing, including from B2B and B2B markets and also a startup firm points of view. This study purposes to be a reference and inspiration for the companies, who want to perform digital marketing more wisely by using big data.

This study consists of four chapters. After the first chapter, which is introduction, literature is reviewed and marketing research process, digital marketing research process and big data concept are explained. In the research techniques and findings part; the aim and scope of research, type of data collection technique, the results of the in-depth personal interviews with limitations are explained. The similarities and differences of big data usage in their digital marketing activities are analyzed In the last chapter, the interview results are interpreted, the differences with other studies are mentioned and the recommendations for future are purposed.

2. LITERATUR REVIEW

In this study, a literature review regarding big data usage in digital marketing has been introduced and three interviews were conducted with different companies from different sectors.

In the first part of the literatur review, the conceptual framework of the marketing research is discussed. In the next section of literatur review, digital marketing concept is described. In the last part of literatur review, big data and the related terms are investigated.

2.1 A CONCEPTUAL FRAMEWORK of MARKETING RESEARCH

2.1.1 Marketing Research as a Concept

Marketing research is defined as the process or grouped of processes, which connect the producers, customers and end users with the marketers, includes the following steps such as, identifying marketing opportunities, generating and evaluating marketing action items, monitoring the performance of the marketing activities, and improving. (AMA.org 2017)

The marketing research is performed to learn the effects between the changing consumer behavior and the changing marketing mix. Marketing research provides to learn about customer needs and wants, to gain compatitive advantage by learning the competitors, to perform a proper planning, to reduce cost of marketing, to find and enter new markets, to select correct pricing policy.

2.1.2 The Process of Marketing Research

The marketing research process involves six-steps, and Sontakki explained the steps in 2009:

   i.   Define management problem.
   ii. Develop an approach.
   iii. Develop marketing research plan.
   iv. Collect data.

v. Analysis of the results.

vi. Develop the research report.

In the first step of marketing research, the management problem is defined. Researchers have to think about the aim of the study, all required data including the historical information and the way of gathering information, which is required for making decision. (Wikipedia n.d.) Management problem should be identified as a research problem. Once the problem is identified, an approach to the problem can be developed, which is the second of the process.

In the second step, research questions, hypotheses and all factors, which may effect the research, are identified. Discussions in this step should be performed with the managers and experts with case studies, simulations, qualitative analysis (Wikipedia n.d.)

In the third step, a research design plan is developed. A research design has the output of the whole plan which includes the ways of how the research questions will be answered and the hypotheses will be tested. (Silver 2012). To develop a research plan, six sub-steps are required (Sontakki 2009):

i. Definition of the objectives

ii. Plan the investigation

iii. Define the methods to collect and analyze data

iv. Time estimation

v. Plan resource management

vi. Plan the budget.

In the forth step, after the readiness and approval of the research design, the researcher starts the task of data collection. The reseracher should select the methodology of data collection which includes primary and secondary data. Primary data is the data which is collected for a specific reason to solve a problem whereas secondary data is collected for different purposes.

Primary data may be collected by interview, survey, observation or experimentation. Secondary data includes published and unpublished information which can be provided

frrom the external parties such as published survey results, reports, books, journals, magazines, online etc.

In the fifth step, collected data will be edited, verified, analysed and interpreted. In analysis of data, the researcher examines the tables so designed, compares them, computes, averages and percentages and applies refined technical and statistical techniques of correlation and regression to understand and explain the data behaviour (Sontakki 2009).

In the sixth step, the research report will be prepared. The presentation of the report should be simple and fulfill the requirements for the study. Charts, diagrams, graphs, photographs cab be used. The findings, conclusion and recommendation for the next steps should be explained clearly and precisely. A typical research report has a title, table of contents, the definition of the management problem, and research problem which is converted from the management problem, data collection procedures, data analysis with assumptions and limitations, conclusion including findings, recommendations. At the end of the report, appendices, glossary, tables, figures, charts, diagrams, photographs can be found (Sontakki 2019).

At the end, research report should be followed up. Research report is the basis for executive action to solve the problems encountered. Therefore the actions should be followed and findings or research should be implemented.

2.1.2.1 Research approaches

To collect primary data, researchers have to take actions by using the research techniques, such as observational research, ethnographic research, focus group research, survey research, behavioral data and experimental research.

Observational research is defined as a qualitative method and collects and analyzes through observing the environment (Chron Small Business n.d.)

By using ethnographic market research (EMR), the researchers evaluate the impact of the customer's lifestyle, behaviors, attitudes, culture to their product selection and usages. In other words, they observe how their customers use the product and services.

Focus group is another research approach and defined as a qualitative research which is popular in marketing research. A group of individuals, which includes 6 to 12 people, is selected as a focus group to discuss them about a specified research problem. (Thoughtco 2019)

Survey research is conducted to learn the customer's opinions, beliefs, feelings and thoughts about the research problem through the questionnaires or interviews.

The behavioral research analyses what the customers buy, how they choose the product and services. Compared to survey research, it provides more accurate data. (Businessjargons.com n.d.)

Experimental research is performed to analyze the relationship between cause and effect. Change in customer behavior is evaluated taking into consideration of the change in product attributes.

2.1.2.2 Marketing information system

Marketing information system (MKIS), which is a management information system (MIS), is used to get marketing decisions easily. In 2007, Jobber defined MKIS as a system, which collects, holds, analyses, reports the marketing data and provides outputs for the managers to help with their decisions.

Philipp Kotler identified the four components of the MKIS which are internal reporting system, marketing research system, marketing intelligence system and marketing decisions system. Figure 2.1 shows the components of MKIS. Internal reporting system includes all data available in the organization such as customer relations management (CRM) data, sales data, ordering, inventory, payables, costs, historical data of the marketing research activities, old reports. (Yourarticallibrary.com 2015). Marketing intelligence system provides information to the managers such as the external environment. Marketing research system collects primary and secondary data and provides the reports as output. Marketing decision support system finds out the possible scenarios by using the collected data. It predicts the outcomes of the scenarios.

Figure 2.1: Marketing information system
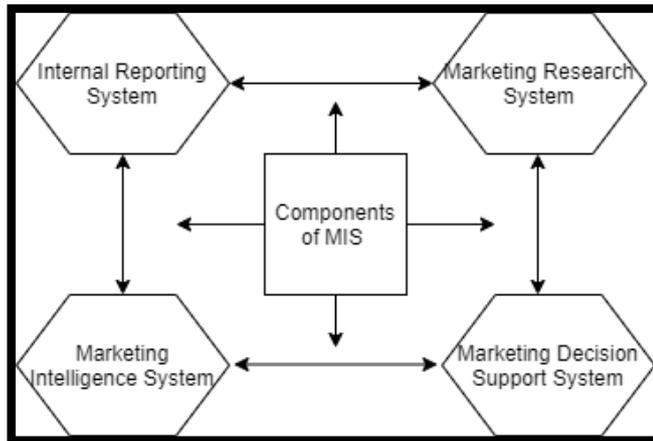
Source: yourarticallibrary.com, 2016

2.1.3 B2C and B2B Marketing

B2B stands for business to business, whereas B2C is business to customer. The main focus of B2B sector is the product and its features. Customers are enterprise and also investigate alternative solutions. At the same time, B2C marketing is dealing with end users. Saha et al. (2014) explained the differences between B2B and B2C markets as in Table 2.1.

Reklatis et al. (2019) define the differences between B2B and B2B as evident and indicated that the organizations should plan and realize the marketing communications according to these differences. From marketing point of view, the most important difference is emotional relationships is used in B2C marketing with the consumers.

Table 2.1: The differences between B2B and B2C markets

	B2C	B2B
Focused Customers	Consumers / End users	Enterprises
The size of the market	Big	Small
Sales	Low	High

Risk	Low	High
Time to Purchase	In a short period	Long period
The type of payment	Cash or with credit cards/bank cards	Longer and complexer procedure
Buyer decision	Emotional relationship	Rational relationship

2.1.4 New Trends in Marketing Research

Over the past years, artificial intelligence (AI) has gained more popularity and are known as new trends in marketing. AI introduces new and exciting types of voice of customers (VOC) data which can be used by decision makers. By using machine learning, organizations can evaluate the collected data continously and understand their customers deeper including voice and face recognotions. Chatbot technology powered by AI, which conducts a conversation using texts or audios, is trending in marketing area as well. (focuspointeglobal.com 2019)

Social media polling tools, which helps to find out to get the opinions of the customers, are on the rise as a trending marketing research tool. Advanced social listening tools, which allow businesses to analyze and respond to the conversations on social media about their brands, provide the chance to collect data without disturbing the customers.

Webcam eye tracking, which already exits, will be more popular and be used for marketing research activities to gain deep customer insights.

Big data is a trending and powerful technology which can be used in marketing research as a complementary and is explained deeply in section 2.3. It provides purchasing patterns of the consumers, the ability to analyze and track behaviors in real-time and allows organizations to make decisions and predict future behaviors.

Small data is as enough small as to be interpreted by humans whereas big data is complex and requires complex systems to be interpreted. The differences between small data and

big data are; volume sizes, data sources, speed, format and data location which are explained in below table (EDUCBA n.d):

Table 2.2: The differences between small data and big data

Criterion	Big Data	Small Data
Example of the data source	Web site user journeys, social media inputs	CRM data
The size of data volume	Terabytes (TB) and much more	Gigabytes (GB)
Data speed / velocity	Fast	Slow
Data format / variety	Text, images, video, audio, JSON, logs, XML, sensor datas	Excel, XML, JSON
Data quality / veracity	low	high
Location of data	Cloud and external file systems, distributed file systems	Local servers, traditional databases (RDBMS)

2.2 DIGITAL MARKETING RESEARCH

2.2.1 Digitalization as a Concept

The American Marketing Association (AMA) Board defined the marketing as an activity which includes the processes to create, communicate, provide the offers which have high value on the customers. (Ama.org 2017) Marketing creates customer satisfaction while gaining profit.

Digital marketing is the marketing of the product and services over the digital channels by using digital technologies to aquire, retain, satisfy customers, to increase brand awareness, customer loyalty and sales. (Simões et al. 2019)

Digital marketing uses not only internet marketing but also all other communication channels which do not require and internet connectivity, such as short message service (SMS), multimedia message service (MMS), electonic and interactive billboards.

2.2.2 Types of Digital Marketing

Some types of digital marketing are social media marketing (SMM), content marketing, E-mail, search engine optimization (SEO) and search engine marketing (SEM), mobile marketing, short messaging service (SMS), multimedia messaging service (MMS), display advertising, digital video marketing, pay-per-click (PPC), blogs, influential marketing, affiliate marketing.

2.2.2.1 Social media marketing

Social media marketing is used to communicate or promote products and services and also to enhance customer relations by using social media platforms such as Facebook, Twitter, Instagram, Pinterest, Snapchat, LinkedIn and Youtube. It might be a post, an advertisement on social media and also even a tweet. For instance, by writing a website's URL in a tweet will increase the inbound traffic of the corresponding web site.

2.2.2.2 Content marketing

Content marketing provides a relevant and valuable content for the customers. As an example, blog posts, videos, white papers, articles, ebooks can be given.

2.2.2.3 E-Mail marketing

E-Mail marketing is mostly used as a digital marketing channel for reaching the customers directly via electronic mail. It is fast, cheap and easy for the marketers to reach to their customers. Additionally, companies send out newsletters, which are relevant for the customer. Email newsletters are a cost effective way of reaching the customers. Email personalization is a way for sending targeted message to the customer and by this means creating more engaging email experiences to the customers. An example would be Amazon.com. The company sends personalized emails suggesting products similar to your last search items. This email is a strong example of how to use a contact's search behaviour to re-engage them with the company.

2.2.2.4 Search engine optimization marketing

Ledford (2007) defined that SEO is used to increase the search engine ranking by customizing elements such as keywords in the web site. This process increases the visibility of a web site in the results of search engine, including Google, Yandex, Yahoo, Bing etc., as free of charge. The keywords and phrases, which are included in the content of the web sites, are used to increase the visibility and they should be selected wisely to implement a successful SEO. The page which is ranked higher than the others, would have more chance to be visited.

2.2.2.5 Search engine marketing

Search Engine Marketing (SEM) is used to increase the visibility of the web sites on the Search Engine Result Pages (SERPs) through SEO. SEM includes both paid search results and organic search results, which is SEO.

2.2.2.6 Mobile marketing

Mobile marketing reachs customers through their mobile devices including mobile phones, tablets, applications. The increase in the usage of mobile devices encourage the companies to use mobile marketing. Mobile marketing categories are SMS and MMS marketing, mobile applications based marketing, in-game mobile marketing, location based services, quick response (QR), push notifications.

2.2.2.7 Display advertising

Display advertising, or banner advertising, is displaying the advertisements on web sites, mobile applications, social media by using banners, texts, images, logos, videos, audios, or gifs.

2.2.2.8 Affiliate marketing

Affiliate marketing is a referral marketing model, which is a cost effective solution and decreases online marketing costs. Basically, web sites pay commissions to the other web pages, which sends traffic to them.

2.2.3 The Process of Digital Marketing Management

Philip Kotler explained the process of marketing management; "marketing activity is to analyze market opportunities that arise, studying and choosing target markets, developing marketing strategies, marketing programs, organisation, implementation and control of marketing efforts". Zait (2009) defined the steps of the process:

i. Define market opportunities

ii. Identify target markets

iii. Develop marketing strategies

iv. Develop marketing plan/programs

v. Implement and control marketing activities.

In the first step the marketing objectives of the organisation should be set by considering organisation's goals and missions. Then marketing opportunies needs to be analyzed by considering the organisation's resources. These marketing opportunities are the gaps in the market, such as not fulfilled customer needs and wants. The company conducts effective market research which provides needs and wants of the customer, information about the competitors, and market trends. This information helps to define the target markets, investigate them and select by using segmentation. For the target market, marketing strategies is developed. Segmentation, targeting and positioning are used to define a marketing strategy. After creating marketing strategy, a suitable marketing mix decisions are taken and marketing plan is created. At the end, marketing plan is implemented and controlled.

Ajayi (2017) indicated that the first thing to develop a digital marketing plan in the digital marketing strategy is to know the current situation of the company. Companies should perform SWOT analysis to know theit strenghts, weaknesses, threats and opportunities. Then the company should set objectives as in the section process of marketing management. After analysing the market, the company should set SMART (Specific, Measurable, Actionable, Relevant and Timely) goals to develop their digital marketing plan. Afterwards the company uses digital targeting to create digital marketing strategy. Personalization and selecting target market segments are quite important in digital

marketing. Company must express clearly the offers, which are presented over digital channels to the customers, in this strategy. Marketing mix should be reviewed for digital channels. Then the strategy is implemented and controlled by measuring the effectiveness.

2.2.3.1 Digital targeting strategy

Segmentation, targeting and positioning (STP) helps to get understanding of the market and direct the marketing activities efficiently. Camilleri (2018) defined market segment; a group of personas or organizations, who have similiar interest, preferences, needs, wants and expectations. Market segmentation is the process of defining these segments and groups the customers into segments.

In the traditional segmentation, there are four types including demographic, psychographic, geographic, behavioral. Demographic segmentation includes the demographic factors including gender, age, income, education, maritial status, ethnicity, nationality etc. Psychographic segmentation is used to increase the relationship with the brands and uses values, lifestyles, opinions, activities and interests. Geographic segmentation segments the customers according to their geographical conditions, and provides variables which needs to be considered by the companies, such as climate, population denstity etc. Camilleri (2018) indicated that market segmentation is required based on the regions because the needs, wants and preferences may differ from one region to another. Behavioral segments the market according to customer behaviors such as purchasing, consumption or usage behavior.

After identifying customer segments, the marketer selects the most profitable segment which would be served using differentiated marketing strategies. The most profitable market segment can be chosen through the criterias such as; profit, making difference from competitors, increase in sales, increase in customer loyalty.

Positioning corresponds the wish of the companies how they want to exist in the target customers' mind. Marketers should define their positioning strategies to increase the customers' perception of the products (Camilleri 2018)

2.2.3.2 Segmentation in digital marketing

According to traditional segmentation, customers are grouped by demographic, psychograpic, geographic, behavioral. However in digital marketing, additional segmentation types could be used to access the right group of people. "Social Technographic" has been used for digital marketing to group customer segments. The organizations can develop a lot of categories to support the marketers. Social technographic classifies the people according to how they use the social media by using likes, reactions, following pages and accounts, posts, reviews, shares, comments, polls, quizzes.

Another way to segment customer in a digital marketing is to find out customer's way of technological access capability for which the term "Technographic Profile" can be used. Technographic profile can be created through traffic sources (web site, ad network), device categories (desktop, mobile, tablet or any other smart devices), browsers (Chrome, Firefox, Safari etc.), operating systems (Windows, Apple, Android, Linux), connected networks (3G, 4G, LTE or cable)

SEO provides additional inputs for segmentation as well. In SEO, keywords which are used in ranking can be segmented and the results will be used accordingly. In other words customized keywords can help to reach the segmented customers.

In addition, conducting a survey on web site can support to collect more information on your customer. These inputs would be useful for segmentation as well.

Organization can use its own data sources such as CRM which includes online behaviors as past purchasing behavior, recently viewed item analysis, visited pages, clicks. All of them could be useful inputs for segmentation.

Cookie segmentation is a marketing technique based on segmentation. Basically when a potential customer visits a website, their journey is saved by cookies on the web site. This information can be used for segmenting the visitors according to their interests.

2.2.3.3 Digital marketing mix

The digital marketing mix is the adaptation of the marketing mix to the digital marketing. Therefore the components of marketing mix which is product, place, price and promotion, should be designed in order to fulfill digital marketing requirements.

Product can be tangible or intangible, as an example a digital product located in cloud. Online audience can easily research and compare the products online and it provides more flexibility for the customers. Digital media could be effectively used to showcase the products so that people can engage with it videos, photos, reviews etc.

Price could be used in digital marketing as dynamic pricing based on location or time. As an example online pricing offers low pricing strategy over digital channels or people can use vouchers, coupons over digital platforms. On digital platforms, customers are able to compare the prices online. By using e-commerce web sites and online suppliers, the operational costs can be decreased and the companies can offer more competitive prices.

Place could be web pages, online shops, social media in digital marketing. Company's website can show off the products and communicates the style and brand image. Digital marketing strategies could be diversified with geo-targeting, geo-fencing, affiliate and co-marketing. Geo-targeting has the capability of delivering different contents or advertisements based on consumer's geographic locations. Geo-fencing has the ability to advertise customers within a certain geographic radius by using GPS or RFID technologies. Another advantage of being on a digital platform is to interact to the customers quickly over social media or chatbots by answering their questions online. The customers can use e-commerce sites 7/24 and there is not any time restrictions like retails.

Apart from traditional advertising ways such as Radio, TV, and newspaper; promotion could be implemented by using the social media platforms. In addition, SEO will increase the visibility of the company website so that it helps to promote the business. E-mail marketing, content marketing, paid ads support to promotion activities as well. Social media marketing, displaying ads on internet and also digital world of mouth which are forums, reviews, influencers, are the most popular promotion activities.

2.2.3.4 Digital marketing tools

Digital marketing tools are categorized into analytics, SEO, PPC, social media tools, e-mail marketing, push notification, digital surveys tools, content marketing, affiliate marketing, A/B testing, e-commerce, marketing cloud, cookies, webinars, online PR, inbound marketing, blogs, e-newsletters, SMS, MMS, online videos etc. Examples of some of them are provided in Table 2.3:

Table 2.3: Digital marketing tools

Category	Example of the tool
Analytics & Trackings	Google Analytics
SEO	Moz, Google Analytics
Pay-Per-Click	Google Adwords
Social Media Tools	Sprout Social
E-Mail Marketing Tools	GetResponse, iContact, Mailchimp, Constant Contact, Infusionsoft, Aweber, Emma
Push Notification	Urban Airship, etc.
Digital Survey Tools	Surveys
Content Marketing	Blog posts, videos, white papers, articles, e-books
Affiliate Marketing	Commision based advertisement
A/B Testing	Comparable promotions on web sites
E-Commerce Marketing	Shopify
Marketing Cloud	Salesforce, Pega, Adobe
Cookies	Web cookies

2.2.4 New Trends in Digital Marketing

The world is changing through modern technologies. New trends prove technologization of marketing communication in various aspects and various ways of entering into relations with consumer. The most interesting with respect to marketing activities are: AR, QR codes, chatbots, and infographics. (Dejnaka 2017)

Augmented Reality adds virtual information on top of the real world innovatively. (Rauschnabel et al. 2019) It connects the real world with virtual elements using computer graphics. With the AR technology, the software scans the real image by linking with the products offered by the company so the consumer sees the combined picture or they can try before buying it. In addition, the user can see a three-dimensional product. AR could be used in touring and assistance. (Rauschnabel et al. 2019)

QR Codes can be read by mobile devices. Marketers uses them in billboards, magazines, web pages, products, and campaign materials. With scanning QR codes, customers load the landing page of the company or dial company business, send a message or e-mail, download application, view business location, direct to social media pages or shopping and e-commerce.

Chatbots are a software, which uses Artificial Intelligence, and can be programmed to facilitate conversations with your customers. They increase the quality of the customer services, decreases cost and time and accessible 7/24 over internet.

VR helps people to experience the real world with the sense organs eyes, ears, nose and hands by adding real images, sound with a computer (Brkljac 2012). By using VR, companies can create 360-degree multimedia and it allows users to see all dimensions from any angle of the view. It is used for the existing and also planned (not existing) products. VR provides the chances to the customer to experience the products before they buy.

Omni-channel marketing provides to customers smooth and seamless journey independent from the channels used. Omni-channel marketing has two diciplines; multi-channel marketing and IMC. (Cummins et al. 2016). Multi-channel marketing is defined

as "the design, deployment, coordination, and evaluation of channels to enhance customer value through effective customer acquisition, retention, and development" (Neslin et al. 2006). IMC is defined as "an audience-driven business process of strategically managing stakeholders, content, channels, and results of brand communication programs" (Kliatchko 2008).

In addition, stories, live videos on Instagram, Facebook are changing into an effective digital communication channel for the marketers.

2.3 A CONCEPTUAL FRAMEWORK of BIG DATA

American Assosiation of Public Opinion Research defined big data is an "imprecise description of a rich and complicated set of characteristics, practices, techniques, ethical issues, and outcomes all associated with data" (Japec et al. 2015).

2.3.1 Big Data as a Concept and Related Terms

Chen et al. (2014) added a more technical definition to big data; "big data processes the datasets which cannot be interpreted, stored, managed, and processes by traditional software or hardware tools". In other words, this term is used for capturing, storing, managing, analyzing and processing a hugh amount of data which cannot be managed by any traditional database management system such as RDBMS. With the increase in data sizes, the complexity gets more and it causes difficulties in interpreting and managing of data. Consequently, nowadays enterprises require big data analytics tools with real-time or near real-time capabilities to process this kind of complex data sets.

2.3.1.1 Characteristics of big data

Zikopoulos and Eaton (2011) identified the characteristics of big data in 3Vs, volume, variety and velocity. "In Lomotey and Deters (2014), this model has been extended into 5V, by adding: Value for understanding the cost and value of data and Veracity to check the accuracy of the data and data cleaning" (Koskinen et al. 2015, p. 166).

The primary attribute of big data is definitely volume and corresponds how big the data is. The volume of big data could be in TBs or PBs because of coming from lots of different sources including logs, clickstreams, social media, sensor data (Elgendy et al. 2014)

Therefore storing and processing of this amount of data sets would not be possible with traditional storage systems.

Variety corresponds the types of data and big data has unstructured data and has different types whereas the traditional data types can be stored in the relational databases as they are structured. With the changing technology big data comes from lot's of different sources with different data types such structured, unstructured, geographic, real-time media, natural language, time series, event, network and linked. (Tai 2016).

    i.   Unstructured Data: audios, videos, emails, social media , logs, IoT, clickstreams

    ii.   Semi-structured Data: JSON, XML

    iii.   Structured Data: Excel, TXT, relational databases, RDBMS

Velocity corresponds to the speed of the arriving data and the speed of the change in data. High velocity data is requires distributed processing techniques with real-time and non-real-time capabilities. Veracity is the quality of the data and deals with the correctness of data. (Agarwal 2016). Value provides the ability to turn huge amount of data into valuable resources. It helps to improve the efficiency of the organisation, effectiveness in maintenance. "It is all well and good having access to big data but unless we can turn into value it is become useless. It becomes very costly to implement IT infrastructure systems to store big data, and business are going to require a return on investment." (Ishwarappa et al. 2015)

2.3.1.2 Advantages and disadvantages of big data

Ciklum (2019) explains the advantages of big data which are; easy and quickly identification of the root causes of the failures, fraud detection, catching errors quickly and responding to the upcoming failures, supporting innovation, increasing revenue, defining the pain points, learning the customer needs, creating customer value, increasing customer satisfaction and loyalty, tracking the movements of the customers, knowing

better about the customers, predicting the customer trends, increasing operational effectiveness like customer services. (Ciklum 2019).

Unstructured data is captured from IoT, human and online machines which provide rich, varied data which can be used to understand user requirements. The examples of unstructured data are social media, keyword searches, clickstreams, YouTube videos and this kind of real-time data provides to the companies to create real-time advertisements. (Jabbar et al. 2019)

Besides the advantages, the disadvantages are cost of deploying and managing of big data platform, complexity and requiring proper training and to hire experienced employees, difficult to decide the correct platform, possibility of misusage of the collected data by sharing private data between the organisations. Regulations tries to protect the customers from misusage but organisations must be more careful on this topic.

2.3.2 Big Data Tools

Big data can be integrated and implemented by using different tools such as Hadoop, Spark, MapReduce, Pig, Hiv, Cassandra and Kafka (Towards Data Science 2019). Based on the special requirements of companies, the most effective tool is chosen by the companies after evaluating advantages and disadvantages of them. In Figure 2.2, Towards Data Science presents big data tools:

Figure 2.2: Big data tools
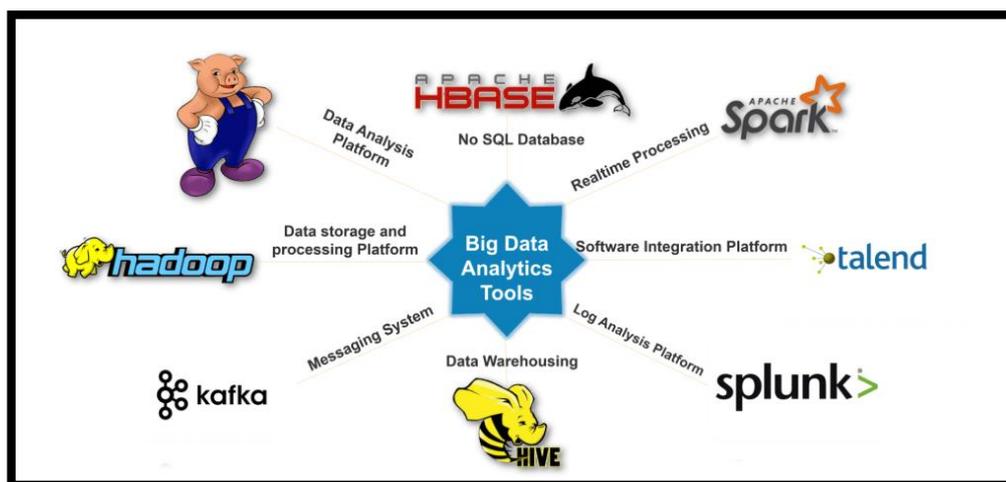
Source: Data Science, 2019

Hadoop is mostly used and very popular in big data implementation and has the capability to handle with hugh data including both structured and unstructured data formats (Gavali et al 2018).

Apache Spark is a computung engine and processes data on computer clusters with parallel processing. (Databriks n.d.)

Apache Cassandra is a database with the capabilities such scalability and high availability and is a good choice for web and mobile applications. (Apache n.d.)

Kafka is another successsful tool with low-latency and real-time processsing functionalities. (Yadranjiaghdam et al. 2016)

Apache Storm is free-of-charge and open source real-time processor and has complex event processing capabilities.

2.3.3 The Implementation of Big Data in Digital Marketing

The most popular approaches of big data processing are batch processing and real-time processing.

2.3.3.1 Batch processing

Batch processing can be used in the solutions, which requires data in a specific time window. Mostly it is being used with Hadoop and MapReduce, which are used for keeping and analyzing structured and unstructured data to identify historical patterns and trends. MapReduce programming model, which is presented in Figure 2.3, creates big data sets on a cluster which filters, sorts and reduces. As this solution is applicable for creating historical data decision, it is not suitable for real-time solutions.

Figure 2.3: Batch data processing for historical data
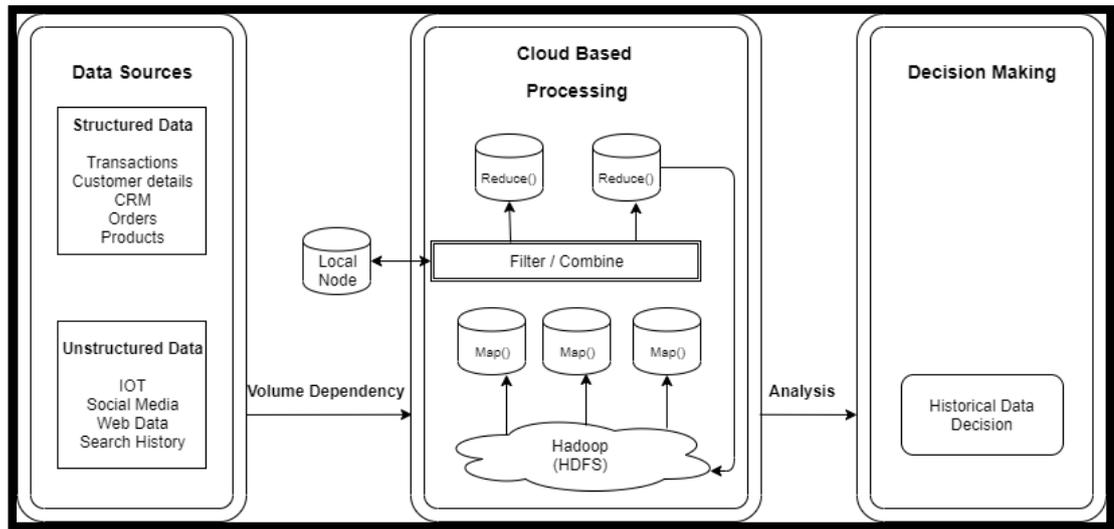
Source: Jabbar, et al., 2019

2.3.3.2 Real-time processing

Input data arrives to the system as continuous streaming and can be processed in real-time. With the help of real-time processing, organizations can react very fast to the changes in consumer behaviors or any change in the market. Consequently it has continuously updated data sets for the decision making. Figure 2.4 provides an example of real-time data processing with Apache Storm which is cloud based system:

Figure 2.4: Real-time data processing
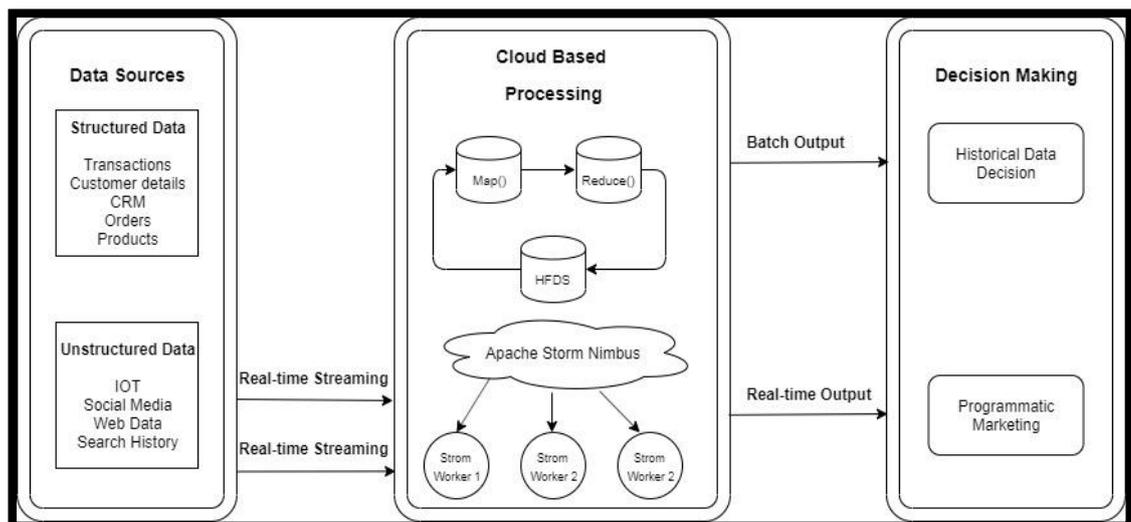
Source: Jabbar, et al., 2019

2.3.4 The Role of Big Data in Digital Marketing

Digital marketing collects and processes big data coming from different sources. Through proper data processing, customers are reached out more accurately with low costs. Data-driven marketing is becoming a significant part of digital marketing, while big data in the marketing context is termed data management platform (DMP). Customer's data from various online and offline sources are aggregated from web analytics tools, mobile web, mobile apps, e-commerce portals, behavioural and demographic data, CRM data, POS data, social networks, online video, Smart TV data etc. (Jacuński 2018)

Basically, the main advantage of big data is to learn much more about the customers. In addition to the standard demographic information, companies are able to track customers' digital behavior. With the help of big data, customers's lifecycle and behavior are understood. "Customers voluntarily generate a huge amount of data daily by detailing their interest and preference about products or services to the public through various channels."(Anshari et al 2018) For the business, to profile customers is very important and they are trying to offer personalized and customized product and services to the customers through their CRM platforms (Lies 2019)

Product Development is a use case that big data is involved in predicting for new products and services after analyzing past and current situation by defining the relationship.

Customer Experiences is another important use case in big data. It provides personalized, consistent, omni-channel customer experiences and better capability to offer next-best-actions in real-time.

Real-time data provides to the companies to create real-time advertisements. Consequently, the organizations can react the changes in the market fastly and keeps the data continously up-to-date.

Fraud and compliance is another use case in big data to identify fraud issues quickly to save money and reputation.

The term "Machine Learning" is defined automated data processing system and decision-making algorithms and it can work with big data efficiently. Machine Learning algorithms

provide effective automated tools for data collection, analysis, and integration. Some of the common applications are web search, recommender systems, ad placer.

3. RESEARCH TECHNIQUES AND FINDINGS

The research has been conducted to analyse how big data usage affects digital marketing management activities. In the research section of this thesis, aim of the research, scope of the research, methodology, data collection and findings are discussed as subtitles.

In-depth interview is the methodology of the research. Interviews have been performed with the people from different sectors to analyse the effects of big data usage in different industries.

3.1 AIM OF THE RESEARCH

The aim of the research is to show that there are lot's of opportunities to perform a 1-1 marketing by using big data in digital era. In addition, to explore the correct customer needs on right time with a right attidute can be performed by using big data and the right decisions can be taken.

This thesis will provide knowledge sharing between the industries by studying the different examples from different sectors. Consequently, this thesis could be used as a reference to see how big data is integrated and used in different industries. Thus, following objectives have been set to follow up through the research:

i. Analyze the integration of big data in digital marketing from different industries points of view.

ii. Analyze the differences of big data implementation in digital marketing from B2B and B2C points of view.

3.2 SCOPE OF THE RESEARCH

This research has been applied in Turkey but interviewees have been selected from global companies serving B2B and/or B2C markets. While defining the people to participate in the in-depth interview, they are considered to be people who are working in marketing departments and use big data in their digital marketing activities. Interviewees are selected from different sectors; building automation technology (Siemens), shoe manufacturer and seller (INUOVO) and camera and flash trigger producer (MIOPS).

3.3 METHODOLOGY

The method used in this thesis is in-depth personal interview, which is a qualitative research technique that is personal discussion and includes a few interviewees to discuss their thoughts, feelings, behaviours, knowledges, and awarenesses on a particular idea.

Figure 3.1 explains which steps are in conduction in-depth nterviews involved. The first step is to develop a sampling strategy. At the beginning, interviewer should be well prepared. The following steps should be performed: reading, planning the interview, select and contact interviewees, preparing a set of interview questions, making contact and planning meetings. (Brounéus 2011) Secondary sources would be reading a variety of different sources such as articles, books, papers etc. And then interviewees should be defined according to required information. At the second step, interview questions will be prepared with simple language, like normal conversation. At the third step, the interviews will be scheduled according to the interviewee's schedule which is quite hard because of their busy schedule. In the last step the collected data will be analyzed with an output report.

Figure 3.1: Steps involved in conduction in-depth interview

Steps Involved in Conducting In-depth Interviews

1. Developing a sampling strategy
(Whose attitudes and beliefs matter to your research, and how will you find these people?)

2. Writing an in-depth interview guide
(An in-depth interview guide contains the questions that will be asked during the interview.)

3. Conducting the interviews
(Contact potential respondents to complete an interview.)

4. Analyzing the data
(Making sense of the findings.)

Source: The Wallace Foundation, 2016

3.4 DATA COLLECTION

Three in-depth interviews were conducted with 3 people from different companies and also different sectors by asking 8 questions. After getting responses from the interviewees, the analysis were performed.

i. The first in-depth interview was performed with the Global Marketing Manager of Siemens, Pinar Celik, on 03.12.2019 over a Skype video call.

ii. The second interview was conducted with the Marketing Manager von INUOVO, Hayriye Selekler on 05.12.2019 over Whatsapp group call. Bugra Gencgiyen from Kreabird Agency attended to the call as well to provide input from agency point of view.

iii. The third in-depth interview was performed with the CMO of MIOPS, Ibrahim Can Koc, on 09.12.2019 over Whatsapp call.

People have been selected from different sectors and organizations to collect information from different points of view. As an example, when Siemens is a global campany, INUOVA is a shoe manufacturer, and also MIOPS is a startup company in photography industry. Consequently the different big data usages in digital marketing could have been analyzed.

In order to perform analysis for this study, the open-ended questions have been asked to the interviewees. (see Appendix A: Interview Questions). The first question of the in-depth interview was asked to explore the digitalization strategy of the companies and how they include big data in this direction. Then the company's marketing research activities have been asked to explore how the company use big data and how they perform marketing research. After diving into the digital marketing activities, then some strategic questions have been asked to explore company's position and segmentation strategies. At this point big data has a quite big role to select the target segment. Communication to the customers, performance measurement of the marketing activities and new trends have been also asked from big data point of view.

3.4.1 In-Depth Personal Interview with Siemens

Siemens AG is the largest industrial manufacturing company in Europe with branch offices and serving as a global company. The departmants of the company are Building Technology, Energy, Healthcare, Financing, Industrial Automation and Mobility. Siemens explains their vision, positioning in their global web page as below (Siemens.com n.d.):

> *Vision 2020+ is our strategy to shape the next generation Siemens. With Vision 2020+ we are setting the course for long term value creation through accelerated growth and stronger profitability with a simplified and leaner company. The main aim is to give Siemens' individual businesses significantly more entrepreneurial freedom under the strong Siemens brand in order to sharpen their focus on their respective markets. Our purpose: we serve society, we create value for all stakeholders, we make real what matters.*
>
> *Global megatrends are changing our world. Digital transformation, globalization, urbanization, demographic change and climate change are the greate challenges of our time. As a leading global technology company that stands for the engineering êxcellence, innovation, quality, reliability and internationality, we provide answers in the area of electrification, automation and digitalization.*

1 The interview from Siemens was conducted with the Global Marketing Manager Pinar Celik and she stated the following on their digitalization strategy and the contributions of big data to their strategy:

> *For many years Siemens has been working on the digitalization strategy, and especially we call it "digital transformation". Our aim is to digitilize the systems and products firstly, so that we could use digital systems and offer digital products to our customers. Secondly, the processes that we used within the company is our main focus. The way of working should be digital to sell digital offers or to use digital systems. Thirdly, our focus is to digitilize our whole Siemens organization and the way of working with our all stakeholders including customers as well. The main work of Siemens is the collection of data from site processing and then interpreting. Therefore data is our significant source to create more comfortable, secure, efficient infrastructures or products and services to our customers.*

2 Celik explained their marketing research activities as below:

> *We are selling building automation systems to our customers in B2B market. Therefore our customers are solution partners, and in some cases resellers. They sell our products to the building constructors.*
>
> *Our most powerful channel is our web sites including our company web page and Siemens Hit, which is used by our partners. We use cookies to retrieve most of data from customers as anonymous if they are not logged in. Figure 3.2 represents to an example of the cookies:*

Figure 3.2: Cookie acceptance in Siemens website
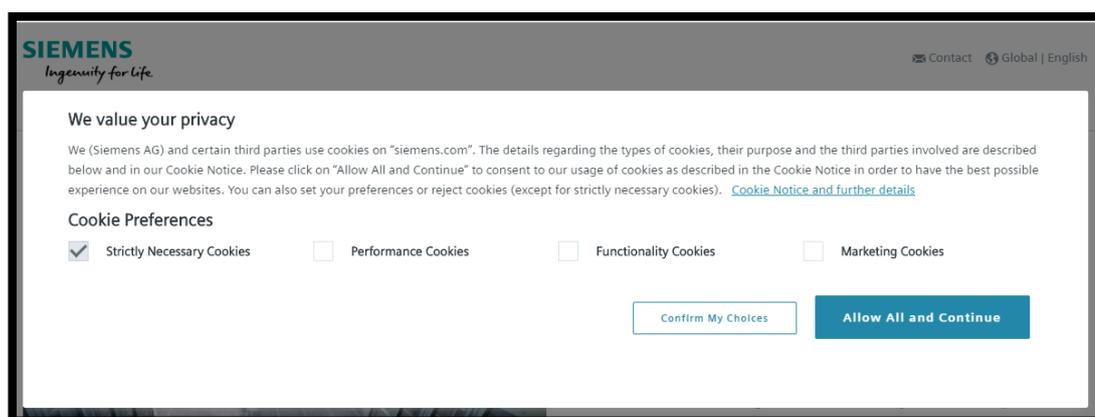
Source: Siemens.com, 2019

> *Of course at the beginning we have to get consent from the customer over different channels. The data is collectable from the customers whose consents are existent. After getting their approval, then we can communicate our offers.*
>
> *In addition, if we want to collect data about a specific content, then we share it on social media to collect the feedbacks of the customers. And also we are creating campaigns over LinkedIn. Our agents perform our marketing activities through LinkedIn, as LinkedIn holds a huge database to reach new or potential customers. Surveys are the most powerful tools to get our customers interests, needs and feelings, which we use sometimes on social media.*

3 Digital Marketing process has been explained by Celik as below:

> *We are using Oracle Eloqua and this is a marketing platform offered by Oracle. We are managing our marketing campaigns, sales and lead generation. As we mentioned, we are using web sites, cookies, Google Analytics, social media, surveys, search engine optimizations and search engine marketing.*
>
> *An example would be, if we would like to promote a sensor, firstly we define geographic (country, region) let's say "Germany Market" then we analyze our internal data of German market and define the target segment by using product specification. Then communicate to the customers who has interest or who could be potential buyer, then we advertise them through our tools, such as Google Marketing or through our agencies over digital channels. Our agencies or marketing platforms (LinkedIn, Google) keep also a lot of data regarding our business, which is quite useful for our campaigns.*
>
> *Another example would be, we are making an awareness on social media to increase the traffic into our web site, then we show up a form to the users to collect information about their interest. In case of an advertisement, we could reach them by retargetting. We are also using Youtube videos to increase the awareness of our products.*

4 The position of Siemens has been indicated by Celik:

Siemens is driving digitalization, a rapidly growing market with a transformative impact on all businesses. We have our world-leading position in industrial digitalization through our software, platforms and services along the whole value chain. Our main focus is to fulfill the needs of our customers.

5 Product development policy and segmentation by using big data has been explained by Celik:

We are providing B2B services and therefore for the new products, we can not use the end users' own usage data. In the idea phase we are not using customer behaviour from big data. We are performing our general marketing research activities and try to find a need in the market.

As I indicated in the previous questions, we are collecting data from our customers over lots of channels such as websites, social media, emails and then we can segment them according to their needs. Then we could communicate them through their needs and interests.

6 Celik states their communication activities in digital marketing as below:

We are creating surveys, posting on social media, sending emails, but above all using our web site as a communication tool. Online demos are communicated on our web site to announce our new products. Digital advertisement banners are used to advertise our product and services in the other web sites. And of course we use Google Search Engine by defining keywords to increase our ranking including with paid services, Search Engine Marketing. We do not use SMS channel at all.

7 The measurement of the performance of the campaigns were explained by Celik:

We are using Adobe Analytics and Google Marketing to retrieve reports of our campaigns. We are defining our KPIs such as conversion rates, click-through-rates (CTR), how many customers do we engage with this campaign, how many out of them are new customers, how many customers did we reach with this campaign, how many of them responded and can be considered as a lead, how much time spent on page etc.

8 "Which strategy follow your company to adapt itself to the new trends in digital marketing" were explained by Celik:

Siemens performs personal developments of the employees and also the customers. We are teaching them digital transformation at first. As we are working on data, company teaches security and privacy to all employees. We are working on the easiness of the tools which are used by the employees and also customers and adapt them to the digital world to increase the efficiency. Our company provides challenges to the employees by giving gifts to the people, who are mostly active on social media with their posts. The leaders's aim is to be a role model for the employees to use digital media.

3.4.2 In-Depth Personal Interview with INUOVO

Inuovo is a well know worldwide brand with its headquarters in Istanbul Turkey and branch in Waalwijk Holland. The collection is made in China, India and Turkey, after launch, shoes are produced in factories. Inuovo is not a manufacturer it is a brand working with factories all around the world. Approximately 1 million sandals are sold just in one season in the Europe. Sales channels are resellers and online web site. The keys to success of a Turkish brand becoming that famous in the world, can be explained in 3 approaches: a) Has an outstanding vision of a fast fashion and trends, b) Can understand and serve to a wide range of customers, c) Ability to manage complicated logistics.

1 The interview was conducted with the Marketing Manager Hayriye Selekler, and she explained the digitalization strategy of INUOVO and the contributions of big data:

At the beginning was Inuovo serving only B2B Market, consequently we did not have any data about our customers. Afterwards we decided to change our strategy involving B2C market. At that point, we decided to have a big data platform to serve our customers better, to offer them smart over digital media. As Inuovo, we have been using big data technology and we are using mostly Facebook and Google Analytics. Our company is a very strong brand in the global market and sells the products all over the europe. Therefore we could collect lot's of data from different countries.

2 Selekler stated their marketing research activities:

There was a need of data and we decided to have big data for our marketing research activities. Firstly, we made only mass marketing and did not perform segmentation. We presented several campaigns of our portfolio and advertisements to collect their attitudes, preferences and choices. Our first aim was to collect data about our customers. This provided and also provides metrics to segment our customers, such as; according to their economic status, demographic info, education, age, gender, payment type preference, geographic info, culture of living country, even the weather conditions in the living country. After segmenting our customers, we can retarget them. As we indicated we are serving lot's of countries and each country has its own dynamic. Therefore we cannot sell the same products all over the world and we need to differentiate products according to customer needs and preferences.

3 INUOVO has the following Digital Marketing process:

In the digital marketing area, we are trying to use all possible platforms such as Facebook, Twitter, Pinterest, Instagram, Messenger, Blogs. We are using Google Analytics, digital advertisement banners, Facebook integration and use the power of artifical intelligence. Our main digital platform is our web site and from our web site we announce our new models and sell our products. We are using A/B Testing to decide which models are trending and to see who prefers which products. Cookies provide to collect data about the customer jouney and how customers interact with our website.

4 The position of INUOVO was explained:

We are powerful in summer season and our position is to be the strongest firm within europe for flip-flops. We are trying to be the market leader in the central european. In order to gain this position, we need to continue on collecting data from our customers and manufacture and design shoes which our customers need and want. We will continue on focusing on B2C Market.

5 Product development policy and segmentation by using big data:

We are creating several campaigns four our portfolio and present them to all customers on our web page. In addition, about the new potential products, we are presenting them in our web page as limited-edition, then we analyze if it could be sold much more or not. Then we decide to manufacture hugh amounts.

We mentioned segmentations steps in the previous question. In addition, customer logs in, clicks on the product and then views, adds favourites or into the shopping cart, pays. Every action provides us their needs and wants, which can be used in our segmentation and communication. Criteria regarding behavioral segmentation, that we used, are page views, previous purchases, used product benefits, bought product attributes, shipping and payment methods used, or reward program participation.

6 Selekler introduced their communication activities in digital marketing:

Or first communication channel is our web site and the customers gains discounts after they subscribe our web site. Consequently, we are retrieving customer data including e-mail addresses. After getting their consent, we are reaching them over e-mails. Another powerful communcation channel is social media and with the power of social media, we are trying to gain customer traffic towards our web site. We do not prefer to use SMS as a communication channel.

7 The measurement of the performance of the digital campaigns were explained:

As we are e-commerce company, conversion rate is the most important metric for us. How many times the product is sold, added into the shopping cart, added into the favourites, click rates, revenues, time on page are our basic metrics.
Mainly, our company focuses on the report that compares customer aquisition costs vs. advertisement costs.

8 "Which strategy follow your company to adapt itself to the new trends in digital marketing" were explained by Selekler:

Transformation of being only B2B company into a B2B and also B2C company. In order to perform this transformation, we have to adapt to new technologies, we have to collect more data on our customers and segment them and take actions by using more artificial intelligence in predicting the behaviour of the customers. This is our strategy to adapt the new trends.

3.4.3 In-Depth Personal Interview with MIOPS

MIOPS, which entered into this sector as a startup company in 2014, is the manufacturer of products for photographers and video producers and produces camera trigger system. The company has a marketplace presence in more than 20 countries. The company participates in major photography events around the world and increases its brand awareness. MIOPS always pays attention to the quality and customer satisfaction first. (MIOPS.com n.d.)

1 The interview was conducted with the CMO, Ibrahim Can Koc, and he explained their digitalization strategy and the contributions of big data:

> *MIOPS is a brand and sells the products online. Therefore it is essential for us to build and run a digitalization strategy. As MIOPS we position the digital tools in the heart of our communication strategy whereby we reach our consumers in a very targeted way.*

2 Koc stated their marketing research activities:

> *By doing research, we focus on the right questions to be asked. With the help of the right questions, you get the right answer for your business. We do not ask questions just to people around while we are doing researches. Especially, we ask the questions ourselves how to find the right content from big data. For us, a big data is content and data that we get from our consumers. More in detail; big data comes from consumer footprint in our web site, consumer pattern from social media accounts, search metrics, social media comments and feedbacks, our surveys and newsletters, etc. In our web site, signing up helps to collect more information on our customers. That's why we display a pop-up massage and ask our customers for signing up to subscribe newsletters and to get the exclusive offers:*

Figure 3.3: Sign up request in MIOPS website
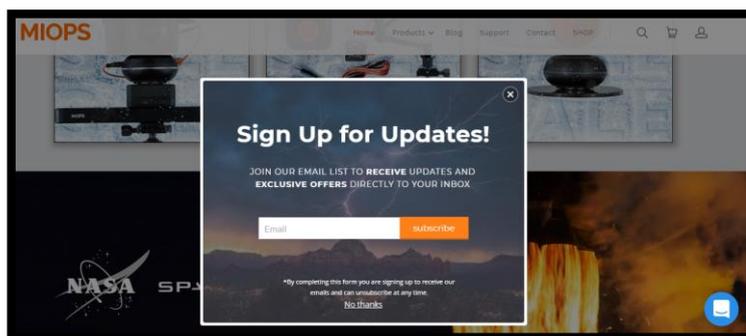
Source: Miops.com, 2019

3 MIOPS has the following Digital Marketing process:

Our main goal is to drive the customers into our web site. Therefore we use social media very effectively and do at the same time very targeted media buying. The success of our marketing management is to create the right content for the right targeted consumer and reaching them over the right channels. Just because our products let the photographers to create a genius content, we are lucky that, as a brand, we do not have to generate a content. We use UGC, which is user generated content, in our digital assets.

We also use the affiliate marketing and give to the companies 15 percentage of commision for each successful referral. Who wants to advertise our products; like the organizations with a large network, social media influencers, or bloggers; can join our affiliate marketing system over our web site and choose the products which they want to advertise.

4 The position of MIOPS was explained:

We are the market leader in camera trigger world. Our goal is to keep our position at first and keep being trendsetter with launching new products into the market.

5 Product development policy and segmentation by using big data:

We are an agile team with a great R&D background and focusing on insights that we get from our big data. Insight which comes out from big data drives us for thinking new products. Our target customers are the photographers and video producers.

6 Koc introduced their communication activities in digital marketing:

We use social media channels as our communication tools such as Facebook, Instagram, Youtube, Twitter, Vimeo. With the help of these channels, we can stay in touch with our consumers 7/24. By listenig their activities in our social media tools we can analyse what they really want. Briefly, their behaviours and their digital footprints determine, how we should communicate with them.

7 The measurement of the performance of the digital campaigns were explained by Koc:

All social media tools have its own reporting parameters. As we use more than 10 different social media channels to communicate, we have lots of different types of reporting with different parameters. We sum up all these reports in our internal reporting system and has one customized report at the end. We touch more than one million people per month. After tracking their pattern and digital footprints in our social media channels, we come to a decision if our communication goes well or not. Regarding our decision, we can change or fix our way of communication in our marketing plan.

8 "Which strategy follow your company to adapt itself to the new trends in digital marketing" were explained by Koc:

Trendsetter, team work and open minded are our keywords. With the help of this strategy we are one step ahead of conventional structured companies and our competitors.

3.5 LIMITATIONS

First of all the interviewer–interviewee relationship can effectively limit the effectiveness of an in-depth interview. As in this study we tried to reach senior level managers, to convince them to attend to an interview in their busy schedule was quite difficult. After many trials, some of the managers have been convinced.

Another major limitation was to dive as deep as into the boundaries of their confidential zone. Most of the managers would not attend to the interview because of the strict company policies and they did not want to provide strategic information even if we promised not to publish this study within 5 years.

In addition, the locations and time zones of the interviewees and researcher were different. Consequently lots of interviews were performed via digital communication channels.

Research has been performed by using the interview responses from shoe manufacturer, building automation system manufacturer and a startup company and the analysis is limited with their responses.

3.6 FINDINGS

In this study, three in-depth interviews with the managers from different sectors were conducted. The aim was to analyze big data effect in digital marketing activities among the different industries. The study gave a clear understanding that each industry has own requirements but at the end their implementations and techniques resembles quite a lot.

Firstly, the companies use their web site as the main channel. In their web sites, they insert cookies to collect data, activate retargeting ads and record user activity. Sign up of the web site will provide exact data about the customer and it is definitely used for segmenting. After signing in, companies specify the customer deeply and reach over e-mail as well.

In addition, all companies use Google Analytics as it is provided by Google as free of charge. With the help of Google Analytics they can measure and report page views, visit time, unique visitors, new users, returning users, segmentation, traffic sources including direct or referral traffic, visitor flow, bounce rate, search traffic type including organic or paid.

Search Engine Optimization is being used by all companies to increase the visibility of the company web page in the search engine organic results. The reason of preferring this tool is being a free of charge service. Siemens and MIOPS also uses Search Engine Marketing which is a paid service but has a significant role in increasing ranking whereas INUOVO does not use Search Engine Marketing.

Siemens and INUOVO use digital advertisement banner to increase the incoming traffic of their web sites. This banners are displayed over Google AdWords. They are using banners for retargeting, acquisition and brand awareness. MIOPS uses affiliate marketing and gives commissions for each successful referral.

Big data is implemented by all companies to store customer data and used for segmentation as the most important purpose. INUOVO can segment by using economic status, demographic info, education, age, gender, payment type preference, culture of living country, however Siemens segment by using general criteria such as country, region, type of partner, interested products etc. All companies uses this data for retargeting of the customers and do not buy any paid data from external sources. They prefer to use data from their internal tools such as CRM, web site etc. But they work with agencies to perform better while advertising to the target customers. Surveys, used by Siemens and MIOPS, are the most powerful tool to get our customers interests and needs. On the other hand, INUOVO does not use surveys.

Siemens does not use big data in order to decide what products will be manufactured, whereas INUOVO decides the production of some products by analyzing data on their web site by selling them limited-edition. MIOPS performs analysis on their big data to decide new features or products according to the customer needs.

As a communication channel, all companies chose their web page as primary channel. They announce the news, products and advertisements. Besides web site, all companies use social media strongly to send personalized advertisements. A difference would be, Siemens chose additionally LinkedIn as a communication channel. The Marketing developer platform of LinkedIn provides businesses to communicate their customers on LinkedIn by having list of APIs to manage advertisements, shares, social streams. With LinkedIn they increase brand awareness and leads, creates strong relationships (Microsoft 2019). On the other hand, INUOVO uses Interest, Instagram and Messenger as

communication tool, because of serving B2C market. INUOVA combines online and offline capabilities to provide improve customer experience. They are sending discounts as a gift by putting them in to the post package, which are ordered from web sites. MIOPS uses social media as the main communication channel and they also send newsletters and exclusive offers to the customers, who are registered.

For B2C Market, INUOVO has a mobile application which requires to read bookmarks and history of web browser. However, they are not using their mobile application as a digital marketing channel.

The metrics on web site, which are used for performance measurement, are quite the same and listed such as; click-trough-rates, the rate of the engaged customer, customer aqusition rate, reached customer rate, customer lead rate.

All companies takes advantage of artificial intelligence to predict the behavior of the customers and started working on this area. Digitalization is the mail goal of the companies within their economic potential. With Artificial Intelligence, analysis of data points become easier and organizations can display personalized content and offers to each and every individual prospect by analyzing their location, device, past interaction, demographics, etc. (Medium.com 2019) The companies use tools which perform analysis by using artificial intelligence, such as Google Analytics. AI helps with predictions based on data sources, helping for getting more value. All findings are summarized in a table which is shown in Appendix E: Table 3.1 In-depth Personal Interview Findings.

4. CONCLUSION AND DISCUSSION

Big data is used for capturing, storing, managing, analyzing and processing large amount of data which cannot be processed by any traditional database management system. Therefore, enterprises require big data platform to keep much more data of customers, process and segment them more wisely. Customer segmentation divides customers into groups who have similar preferences. With the help of big data and segmentation, companies perform their digital marketing activities more efficiently.

A study was perfromed by Tykheev in 2018 on the same topic by analyzing two clothing retail companies. However in that study, big data implementation in digital marketing is compared between online and traditional marketing which is different topic.

To gain different experiences and views, especially from B2C and B2B Market point of view, in-depth personal interviews were conducted with the companies, Siemens, INUOVO and MIOPS, from different sectors. Interview questions were prepared about the strategy of big data usage in digital marketing. Companies are from the industries; building technology, shoe manufacturer and photography, which are the examples of B2B and B2C marketing including a startup firm. Interviews were conducted with the marketing managers to understand their digitilisation strategy, big data usage, their marketing research activities, digital marketing process, product development and segmentation strategies including big data usage, marketing communication and adaptation of future trends in digital marketing.

According to interview results, it was seen that, all companies use their web site as the main marketing channel, regardless being B2B and B2C. They present the products and offers to the customers, and with subscribe option, they can collect and store more data of the digital footprint in their web sites. They use cookies and track the customer journey.

Another similarity between these companies is to have tendency to use free of charge services, such as Google Analytics, SEO, cookies firstly.

All companies use social media to collect feedbacks from customer and also to advertise. Siemens use mostly LinkedIn marketing for business customers, whereas INUOVO uses Facebook, Messenger, Pinterest, Instagram and MIOPS uses Facebook, Instagram,

Youtube, Twitter, Vimeo. LinkedIn has a wide range of business network and therefore has a big connection database and is a place for engagement and building connections. LinkedIn is responsible for 97 percentage of a business's social media leads. Therefore all B2B companies should use LinkedIn for a successful B2B Marketing. INUOVO does not use Youtube as a marketing channel whereas SIEMENS and MIOPS present their products over it as they are selling the products which have functionalities and can be presented via demos. Therefore for Siemens and MIOPS, video marketing is more important than INUOVO.

INUOVO presents limited-edition for B2C customers and decides to go on with the product or not. However SIEMENS does not decide to develop their products in the same manner. On the other hand, MIOPS analyses the customer feedbacks and behaviors to find out new product ideas. Consequently, in B2C market, there are data of end users which can be used in segmentation, market research activities and also product development. The customers share their reviews on social media and B2C companies should collect, analyse and interpret this data more then B2B companies, which is based on direct relationship between the companies.

MIOPS uses affiliate marketing which fits well to a startup company, to operate at low cost. The products are bought by the niche market, which has mostly social media influencers, or blog owners. Consequently, affiliate marketing passes into their situation well. On the other hand Siemens and INUOVO do not use affiliate marketing as they perform their own advertisements via digital advertisement banners. In addition, MIOPS could reach the targeted customers more easily and they use paid media effectively.

Same digital communication channels were explaied by the companies, including web site, e-mail, social media, digital banner advertisement. B2B Marketing is focused on business relationships, whereas B2C Marketing focuses on transactions. Consequently, differently, B2B companies advertise mostly on LinkedIn.

B2B companies perform segmentation according to the customer needs, company size or the economic value of the customers to define high value customers. As an example, Siemens uses the segmentation parameter, which is type of partner, for this purposes. However in B2C, segmentation could be demographic, geographic, behavioral or

psychographic. In addition, machine learning and continuous customer segmentation can take place in all companies.

Recommendation for future studies would be the usage of continuous customer segmentation with AI which is trending and provides higher level of segmentation. Traditional segmentation methods does not take into account of the changing world. Traditional segmentation uses the data of a spefic time, but the needs and behaviours of the customers are changing. By using this technology, new segments may be exposed, the segments may be obsolated and changed so that the marketers can adapt to the changing word quickly.

In addition to above recommendations, B2C companies can segment the customers in real-time by using their emotional situations, which can be found from their social media or any external sources in order to increase the sales. As an example, womens prefer to shop when they don't feel good and the emotional analysis could be done by using external data.

Another recommendation would be that, the B2C companies can use more location based digital marketing including augmented reality, gamification, which entertains the users more.

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APPENDICES

A: INTERVIEW QUESTIONS

1. How is the digitalization strategy of your company? What are the contributions of big data to your company's digitalization strategy?

2. What is important for your company when performing marketing research? How do you use big data in your marketing research activities?

3. How is your process of digital marketing management?

4. How do you position your company in the market?

5. How do you select your target segment for digital marketing and what is the role of big data by defining it?

6. In digital marketing, how does your company perform the communication activities?

7. How do you measure the performance of your digital campaigns and how do you use big data in this activity?

8. Which strategy do you follow to prepare your company to adapt to the new trends in digital marketing?

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Siemens Turkey 2013 – 2016, Group Manager

Siemens Turkey 2010 – 2013, Marketing Manager

Siemens Turkey 2008 – 2010, Reseller Channel Sales Manager

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INUOVO 2016 – Present, Marketing Manager, Business Development

Chicco 2013 – 2016, Category and Sales Manager

Mavi – 2018, Sales Development Manager

Adidas 2007 – 2010, Product Manager

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MIOPS 2019 – Present, CMO, Chief Marketing Officier

Kale Endustri Holding 2018 – 2019, Brand Development & Digital Transformation Manager

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LTB 2010 – 2014, E-Commerce Digital Marketing Manager

Yemeksepeti 2010 – 2006, Intern

E: Table 3.1 In-depth Personal Interview Findings

	Siemens (B2B)	Inuovo (B2C & B2B)	Miops (B2C & B2B - Startup)
Segmentation Criteria	Geographic (Region, country) Type of partner, Digital footprints in web site and social media Customers' need & interest	Geographic (Region, country) Demographic info Behavioral (payment preference, reward program participation, shipping) Cultural Digital footprints in web site Social media	Digital footprints in web site Social media

Target market & Audience	Niche market
	
	   i. Solution partners
	  ii. Resellers
		Large scale market
		
		   i. Women
		  ii. Resellers
			Niche market
			
			   i. Photographers
			  ii. Video producers
			 iii. Resellers

First Priority	Customer satisfaction Lead generation	Brand awareness Increase sales	Brand awareness Increase sales

Digital Marketing Activities	Web Site Social Media especially LinkedIn SEO & SEM E-Mail Marketing Digital advertisement banners Video Marketing	Web Site Social Media SEO E-Mail Marketing Digital advertisement banners A/B Testing	Web Site Social Media SEO & SEM Targeted Media Buying E-Mail Marketing Video Marketing Affiliate Marketing
Big Data Sources	Website (subscription, cookies) Social Media Search Metrics Surveys External Sources (Agencies, Google, LinkedIn)	Website (subscription, cookies) Social Media Search Metrics External Sources (Agencies, Google, Facebook)	Website (subscription, cookies) Social Media Search Metrics Surveys External Sources (Google, Facebook)
Performance Measurement KPIs	Revenues Conversion rates Click-through-rates, spent time	Conversion rates Click-through-rates, spent time # of sold single products	Revenues Conversion rates Click-through-rates, spent time

	# of reached or engaged customers # of new customers # of leads	# of adding a single product into shopping cart /favourites Customer aquisition costs vs. Advertisement costs	# of sold single products # of adding a single product into shopping cart /favourites Customer aquisition costs vs. Advertisement costs
Adaptation of Future Trends	Development of the employees and the customers Digital transformation of the internal & external tools Being role model & challenge digitalization	More intelligent system	Use digital marketing effectively

CIRRICULUM VITAE

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     Vodafone Turkey 2013 – 2016, Consumer Solutions Expert
     Ericsson Turkey 2010-2013, Solution Architect
     Nortel Netas 2006 – 2010, Software Developer