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Effectiveness, Efficiency, and Ethics of Marketing Analytics

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Effectiveness, Efficiency, and Ethics of Marketing Analytics

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Abstract

The concept of big data has influenced the marketing field in numerous ways. By having access to more information about their consumers than ever before, marketers are presented with a unique opportunity to make the marketing process more streamlined and effective than ever; however, this also creates a challenge in understanding how this targeted advertising affects the brand's perception by consumers. This study looks at the concepts of data marketing and re-targeted ads from three aspects. First, are marketers being as effective as possible to ensure they are sending the right advertisement, to the right customer, at the right time? Second, are marketers being as efficient as possible when choosing the correct platform to reach their target customers? Third, are companies remembering the ethical components of collecting this information on consumers, and ensuring they understand when consumers feel specialized advertising becomes an invasion of their privacy? To answer these questions, I first performed secondary research in the form of a literature review. From surveying the scope of the subject, I then performed primary research by conducting in-depth interviews and a survey. The results show that there are two distinct type of consumers: one group who is accepting of these re-targeted advertisements and welcoming of the specialized marketing, and a second group who is skeptical of this form of marketing and concerned over privacy issues. Marketers must be aware of these two distinct types of consumers and ensure they are choosing their advertising methods carefully to ensure an efficient utilization of resources and to make sure they are not presenting a detriment to their brand for the consumers who do not want catered advertisements.

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Introduction

With the constant innovation in the technological industry, the world is changing quickly. New products and services are being created at a faster rate than ever before, and the way that business is conducted is changing along with it. Businesses are being challenged to keep up with the ever-quickenning pace of technological advancements in order to maintain a competitive advantage in their respective industries. For marketers, this presents a unique challenge in the best way to reach their customers. Over the past decade, one of the most important and popular trends for businesses to keep tabs on their customers is the utilization of big data.

Literature Review

The concept of big data has really only become popular in the 21st century, but its roots began many years before that. In the 1960's, most customer and market information was kept in flat files with little structure. In the 1970's, data collection methods improved slightly with the introduction of the relational data model and the relational database management system. These created a structure for improving performance by creating a program that began extracting value from collected data. However, storage was extremely expensive and accessing the data was a slow process (Hurwitz, Nugent, 2013). A big milestone for the beginnings of big data came in the 1980's with the popularization of scanner data. The use of electronic scanners was originally implemented to reduce costs by the elimination of pricing each individual item and instead storing the price in the barcode. It was not until after the implementation that marketers began to see the value in the data that was being collected. For instance, they were able to track that

customers were more likely to purchase a product when its price was discounted than as an effect of responding to an advertisement. This began a shift from push-marketing to choosing a marketing strategy based off of the consumer's preferences, and created an important stepping stone in realizing the value in utilizing customer data (Fulgoni, 2013).

With the realization of the importance of utilizing data, combined with technological advances in the form of computer software and the Internet in the 1990's and early 2000's, the concept of big data began to be defined. Companies began using data warehouses to store information and integrate their hardware and software systems. They began tracking consumer behavior in real-time, rather than on a monthly or weekly basis. In recent years, companies have been able to use innovations such as cloud-based storage, social media, and others platforms to both track customer behavior and also create marketing campaigns to reach their customer more accurately and effectively than ever before (Hurwitz, Nugent, 2013).

Frampton (2014) explains that today, big data is often defined as extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions. It can also be described in terms of "the 3Vs:" Volume, or overall size of data set, velocity, meaning the rate at which the data is being produced and how fast it can be processed, and variety, which describes how wide the range of data that the set may contain. In looking at these three attributes, it is important to understand what is required to manipulate this data. A system requires a method of collecting and organizing the data, a storage system that will be scalable and distributable while being cost-effective and reliable, and reporting and monitoring tools.

From the requirements stated above, it is clear that effectively utilizing big data can be a daunting task. The reality that so many companies are pouring a large amount of their resources into this industry is a testament to the power that this data holds. It enables organizations to relate to their customers in real time, creating a customized product that specifically aligns with their interests. Arthur (2013) explains that companies can place trackers on the websites that a consumer is visiting, the products they are viewing, how long they spend reading about each product, and how many times they return to the site. From this, companies can determine what products this consumer is interested in, what price points they are willing to pay, what brands they have a preference for, and many more valuable insights. Then, by using emails, social media, mobile notifications, and other forms of advertising, they can create a customized experience for the consumer. Their advertisements become more and more personalized, timely, and relevant. By combining people, processes, and technology, they can drive sales and value, ultimately contributing to the success of their business.

When studying big data, it is important to look at which sectors are utilizing the data most effectively to market their products or services. It seems that one sector that has had great success in taking advantage of big data is retailers. Meiser (2015) describes big data as “a term that refers to the trail of information we leave each time we make a purchase online, ‘like’ a retailer’s Facebook post or allow our phone to track where we go.” He then goes on to describe how retailers can use this information to directly market their customer. For instance, if a consumer clicks on a picture of a retailer’s product, the retailer receives that information and will then place an advertisement for that product on the consumer’s Facebook feed. This also allows them to look at the success of their

products from a wider lens, which is vital when looking at which products to discontinue or to buy in greater quantities for the next season or year.

One of the first companies to utilize collection of big data was Walmart. In 2011 Walmart launched Social Genome, a tool that suggests purchases to customers by combining a customer's social media posts with information about this customer that has already been collected in-house. Walmart would then send coupons to this customer for products that align with this information. Another top retailer who has effectively used big data is Amazon. When a consumer is on Amazon's website and looks at a product, the website will then automatically suggest other similar products to this consumer, based on the buying patterns of other customers who viewed this product. It is believed that these suggestions have contributed to as much as 20% of Amazon's sales (Meiser, 2015).

One specific industry that has taken a creative approach to utilizing technology to create a customized product is the cosmetics industry. With the app ModiFace, consumers are able to receive recommendations for makeup products that are perfectly matched to their skin tone after the app scans around 500 of the consumer's facebook photos to average his or her skin tone. Other companies are using big data collection in different ways. Instead of direct, personalized advertising on social media, they may be tracking how many times a customer calls their customer service hotline or when they are redeeming coupons (Meiser, 2015).

Gudivada et al. (2015) explain that it is also important to note that not only businesses are using big data to increase sales; it can also have other applications such as scientific research. For example, NASA uses four telescopes to take pictures of the sun every twelve seconds and in January 2015 they captured their 100 millionth image. Also,

the 2013 Nobel Prize was awarded for measuring the behavior of over 50,000 atoms over the course of a fraction of a millisecond. This was made possible by the ever-advancing precision of sensors. With the utilization from businesses and scientists alike, there is currently one petabyte of data that can be accessed by the public online, and this figure is growing at a rate of 0.5 petabytes per year.

Another big player in the utilization of big data are governments. In the United Kingdom, citizens and tourists are tracked by digital video technology. Someone walking around London may be recorded by hundreds of different cameras in a day. In the United States, cameras are installed on highways to monitor traffic patterns. They can also record traffic violations, and then send a traffic citation to the violator without ever even having a physical confrontation (Craig, Ludloff, 2011). The use of cameras and tracking devices by the government starts to raise a concern as to what amount of intrusiveness is worth the advantages of combatting crime or threats to security.

With all the power and potential of utilizing big data in marketing campaigns, it is also important to consider some of the risks. Fulgoni (2013), Founder of comScore's Media Metrix, a company that uses online measuring tools, describes how big data must be used correctly in order to have a positive impact on brand health and ultimately improve return on investment. He cites the introduction of scanner data and how although it revealed the trend in preference for price discounts, it also had the danger of threatening brand equity if companies were too quick to lower their prices based off of short-term decision-making and potentially cheapening their brand image. He offers advice for avoiding this risk to brand equity. First, he says instead of responding to price sensitivity alone, brands must establish differentiation in the strength of their product or

service. Next, companies should weigh less importance on measuring click-through rates on online display advertisements, as there is no statistical relationship between clicks on the display advertisement and effectiveness of the ad, or likeliness of it leading to a purchase. He also urges understanding the limitations of putting a cookie on an ad to track its success, as cookies frequently get deleted, and it is difficult to target a specific demographic on a computer that has multiple users, which are used by 60% of computer users. Finally, he warns against ignoring potential customers by over-targeting, and being cautious before giving all credit to a paid search ad for leading to a sale, when it could have been many other factors that led to the purchase, including brand equity.

Along with the potential danger to brand equity, there is a further challenge of quantifying big data results in order to form statistical relationships. Gudivada et al. (2015) explain that the amount and variety of big data being collected is growing more quickly than ever. One staggering statistic on the exponential growth of big data is that over 90% of the world's data was produced in the past two years. This may have been from smartphones, social media, satellites, or various other technological instruments that contain automatic sensors to record and store data. This is presenting a great challenge to companies to be able to store, manage, and utilize all this information. It is important to note, however, that not all of this data is considered useful. In 2013, only 22% of big data was considered useful and only 5% was actually analyzed. As companies begin to further realize the power of this data, however, and as there are more successes in production of sensors and analytic devices, some suggest this figure may rise in 2020 to 35% of data being deemed as useful.

Tirunillai and Tellis (2014) describe the process of making valuable insights from this data. After collecting the user-generated content, the content must be prepared for statistical analysis. Many of the collected data is not inherently quantifiable, as it comes in the form of words and product reviews. Therefore, it must be converted to be able to be used in a numerical manner. This process involves removing non-English words, turning pronouns into the name of the product, and performing further adjustments in order to run statistics on this data to search for the frequency of key words used. They are then able to use these frequency results to perform statistical analysis. Even with this process in place, there is a further challenge in finding enough experts who can create this software or understand how to use it effectively.

Along with the challenge of storing and analyzing this overwhelming amount of data, some are also concerned with the privacy component. Some concerns with privacy include whether the data needs to be kept anonymous, and when the collection methods may become too intrusive to the point of being unethical. For example, Craig and Ludloff (2011) explain that parents may upload a picture of their children at school without realizing that the picture contains the GPS tracker for where the picture was taken. For another example, many were concerned when Google Maps released their latest street view feature, which allows anyone on the Internet to search an address and see an extremely detailed, panoramic view of houses, buildings, and cars on the street. Many, however, found that the advantages of having such a detailed view of places they needed to go, or even the amusement of looking at famous landmarks that they would never be able to see otherwise, outweighed what some may deem as an unnerving feature of the program. Throughout the controversial idea of privacy in the digital age, this theme

becomes common – looking at whether the benefits of the technology outweigh the not-so-private aspects of it.

Tene and Polonetsky (2012) describe some of the dangers that could arise if the invasion of privacy goes too far. It describes how privacy concerns over the ever-expanding amount of big data could stir a “regulatory backlash” which could negatively impact the data economy and potentially delay innovation. It also describes how the more data there is available, the harder it becomes to ensure data security and privacy protection. Some of the privacy concerns of higher importance involve those of health information and Internet services used. Many organizations claim to use a process of de-identification, where they disassociate the data with the identity of the one who created it, but this has been ineffective mainly because it has been proven that it can be re-associated with its origin.

Meiser (2015) suggests that the level of desired privacy is higher or lower among different generations. His article describes that “Only people over age 50 care about protecting their privacy,” according to a futurist named Sanderson. He went on to provide an example, saying, “I’m a vegetarian, ... In 10 years I’ve never bought a single meat item. Yet [the grocery store I shop in] still hasn’t gotten the fact that I am not likely to be tempted by ham or sausage or salami, and is always sending me coupons for these things. It’s annoying and makes me think they don’t care to learn anything about me.”

So where is big data going and what are some challenges it may face? Big data is expanding its volume, velocity and variety more quickly than ever. Companies are being challenged to keep up with this seemingly infinite expansion and how to supply the infrastructure, technology, and skilled labor that it demands. Along with these physical

constraints, they also must be aware of the backlash that could occur over privacy concerns. They need to gauge consumer satisfaction over the amount of data collected, and the methods by which it is collected (Nagod, Mantha, Licht, Stackowiak, 2015).

Interviews

Methodology

After delving into the current research on big data and its implications on marketing, the next step was to formulate research questions to explore. From a management perspective, the question is how to effectively use big data to target consumers in an ethical way. To answer this, some marketing research questions must be asked. First, what are consumers' current perceptions of big data? Are they aware it exists? If so, how do they feel about it? Next, which channels can most effectively use big data? Currently, it seems to be primarily social media and push notifications from applications. It is also worthwhile to explore if consumers have a positive reaction to companies tracking their search and purchase history to then recommend catered products. Stemming off of this, it is important to understand if there is a point that marketers cross that becomes too intrusive in the consumer's mind. Finally, ad blockers should be explored – if ads become more intrusive in the future, will consumers look for ways to block the ads?

To answer these questions six depth-interviews were conducted. Four of the respondents consisted of those in the Millennial generation, aged 20-30 (two males and two females) because the researcher wanted to focus on marketing efforts toward Millennials; however, one respondent was a 61-year-old male and another a 61-year-old female to see if there was an obvious difference in perceptions among this generation.

Each respondent was asked the same questions regardless of his or her demographics or knowledge on the subject. The subjects were obtained through friends and family; therefore, there were many similarities in responses as many had similar life experiences, as well as race, education, and socio-economic demographics.

Findings

The first two interview questions aimed to address the first research question about consumers' current perceptions of big data. The first question asked was, "Do you know what big data is? If so, how would you define or describe it?" For this question, two of the respondents said they did not know what it was. The others provided their perception of it, but seemed unsure about whether their assumption was correct. For example, one respondent answered, "I would say that I have at least a shaky outline of what it is and it's the collection of large and broad-reaching amounts of data about both specific people as well as the general population as a whole." Another respondent replied, "I'm just taking a semi-educated guess here. It's that somewhere somebody is keeping track of my online activity somehow." These responses show that consumers understand that data is being collected on them, but are not confident on the specifics on the concept.

The next question also goes along with the first research question by asking, "Have you ever been scrolling through social media and seen an ad for a product that you had just been looking at on a different website? If so, what did you think about this?" All of the respondents said they had experienced this, but all had varied responses on how they felt about it. For the younger respondents, the male respondents seemed more favorable to the idea. Their responses included, "Yes. Initially I thought it was creepy, but really I think it's genius. I'd much rather see things that I'm interested in and pertain

to me, as opposed to random junk that I don't give a damn about." and, "Yes.

Ingenuitive. I thought it was ingenuitive. And smart. " Some of the females seemed a little less favorable to the idea, with responses such as, "Yes. I thought like, oh that's a little creepy, but then thought about how easy it was to track and realized it was just the way the world is." And "Yes I have. I kind of felt the same way that we felt when we found out the NSA was spying on us, which was like we all knew it, but seeing confirmation of it was just a real bummer. It makes me not want to buy that product."

Both of the responses from the older interviewees were much more negative. For example, the male responded, "Yes. I think it's totally invasive of my privacy. It's annoying and it specifically makes me not want to buy that product at that place." And the female said, "Yes I think it's creepy and I shut down my email and hope it doesn't come back when I reopen my email. It's enough to make me not want to be a part of email. It seems like online stalking, it's so creepy. I might make a goal to never buy online." It is very important to note here that many of the respondents used the word "creepy" when answering this question. Also, a few found it so upsetting that they said it would actually convince them not to buy a particular product.

The next research question to address is which channels will be most effective in utilizing big data. The first interview question asked to address this was, "What are the ways you primarily consume media? Television, radio, social media, etc.?" For the younger demographic, many cited social media, most commonly Facebook, and other websites. They all said they prefer watching television by streaming it online, but try to use services that do not have advertisements such as Netflix or Hulu. Some respondents also mentioned using Pandora and Spotify to stream music. The older respondents

answered with public radio, local newspapers, and television. To explore this research question further, the next question asked was, “Can you think of a time that a website or app suggested a product or provided a coupon for you that you then used without previously planning this purchase?” The older male respondent replied with, “never,” and the older female said, “I always look for something I want to buy, I never look for anything just to look. I’ve only bought online twice. I bought futon covers and a carpet and it was such a horrible experience that I’m veering away from the online shopping experience, going back to local.” Again, the responses from the younger demographic were a bit mixed, with some of them saying no, and others saying that they have spontaneously bought something based off of an advertisement that they saw.

The next research question asks if consumers have an overall positive perception of marketers using collected data to create more catered and specific advertising. The first question asked to explore this was, “Can you think of some other times that apps or websites have changed lately to cater specifically to you?” The older male said no as he is not a big online shopper, and the older female responded, “So I’ll be reading the newspaper online, right? And ads will come up for like my aged people, how do they know that?” Some of the younger respondents answered no, but some others did have examples. These included, “Amazon does other recommendations based on things I’ve looked at and I find that super helpful, especially when I’m looking at gifts for people. I may not have considered it before, but then I see it and think that could be cool. I find that really helpful.” Another male respondent said, “Yeah I noticed based on my age and gender, ads are specifically targeted towards what they think I’m interested in, which is usually pretty miscalculated. I don’t want axe and I don’t want red bull and I don’t have

an Xbox. I do own a PlayStation though, so if there's good deals I'd like to get those."

Another interesting response was, "When I was re-buying my shoes from LL Bean I did it online, and I'm pretty sure Facebook advertised LL Bean boots for awhile. I didn't understand because I had already bought them, so I wasn't going to buy anymore." These last two responses open a question into the success of marketers truly offering relevant ads. The ads were clearly created based off of data about the consumers, but they are not successful at offering products that the consumer would be interested in buying.

I also asked, "Do you think it is good that marketers are creating customized advertisements based on data about you?" The responses from the younger demographic were very mixed, including "Oh sure, yeah," "I am indifferent," and "No." One respondent offered an interesting insight by saying, "I think what's worse is the data collection about me; I'm not as concerned about the ads. The ads are just a visual representation of what's going on, and therefore it creeps us out." The responses from the two older respondents were a little less mixed, including, "No. They don't know anything about me. And it takes the serendipity out of life, and the opportunity for growth and enjoyment." and "I do not like it, I think it's invasive, it's as if they are spying on me illegally. Because they are spying on me illegally." Again, these responses suggest that the older demographic is not too pleased with the data collection. The younger generation has mixed feelings, but also seems to understand that the collection of data is separate from Marketers using it to create advertisements, and some seem to feel the benefits outweigh the concerns.

To delve deeper into concerns of privacy and crossing the line of intrusiveness, the next questions asked were, "Do you currently have any reservations about big data

concerning privacy or otherwise?” and “What are some concerns you have about privacy and technology in the future?” For the responses, many had concerns, but it was more with the data collection itself than its use by marketers. Many also cited the risk of identity fraud and theft. For example, one respondent said, “Not really. I mean obviously with the amount of identity theft and things like that you worry about them collecting the data that could put you at risk, but if they’re collecting the things I’m looking at on Amazon God bless them. Only the sensitive information I’m hoping they’re not collecting, saving or storing.” Another respondent replied with, “The bigger issue isn’t the advertising, it’s the collection of big data. It’s a complete violation of your privacy...It’s almost like putting a camera in someone’s house 24/7 and accepting that we are gonna be filmed, archived, and anything that we do can be brought up in case they wanna destroy us. And that’s a scary implication. So the advertising in a way is good because it makes the world aware of how creepy this collection is. Also, do people ever discuss the danger of playing into people’s vulnerabilities? For example, if someone has a gambling problem and they get gambling ads, is that an issue? An ethical issue?” These responses raised many concerns over data collection and privacy, but were not necessarily always connected specifically to marketing.

The last research question aims to explore ad blocking and if this will have an effect on companies using online advertising. When asked, “Do you currently use any ad blockers on your browser?” most said they only use whichever ones came with their Internet browser. Only one respondent said he actually sought out the most effective ad blockers and downloaded them. The older female respondent replied, “Not that I know of, but I’m going to after this.” The final question to the respondents was, “If

advertisements on websites/apps become more common in the future, will you look for ways to block these ads?” All of the respondents answered yes, but some also noted that it would depend on how distracting they are, as some found the small advertisements as they are scrolling through their Facebook feed interesting and helpful. Going off the fact that each respondent expressed interest in having stronger ad blockers, this is definitely a challenge that Marketers will face in the future, and something they will need to address to be successful.

Survey

Methodology

After conducting the in-depth interviews to gain insight into consumer perception of the practices of using collected big data to create customized re-targeted ads, a survey was developed to gain more feedback on a larger scale. The survey contained 13 questions, including some branching questions; if the respondent answered “yes” to certain questions, it would bring them to another question that asked more information about the topic, and if he or she answered “no” it would skip to the next question on a new topic. The survey was administered through Qualtrics online software.

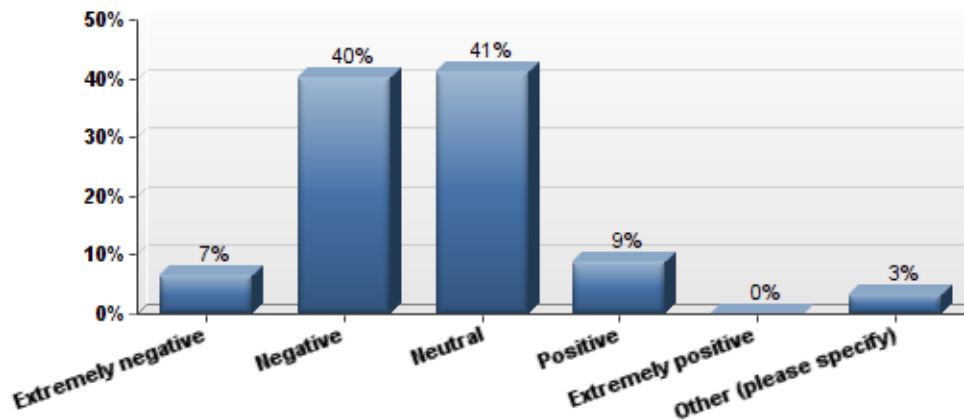
The survey received 104 responses in total, though the respondents were allowed to skip any question that they did not wish to answer. Therefore, many questions had fewer than 104 responses. For this reason, it is important to analyze the frequency percentage for each response, rather than the number of respondents itself. Respondents were asked to take the survey primarily through Facebook, but Twitter and emails were also used to share the survey link. Because of this sample collecting technique, it is important to note that many of the respondents share similar demographic characteristics,

as the majority is part of the researcher's network. Of the respondents, 65% were female, 34% male, and 1% other. The majority of respondents (78%) were aged 18-24, followed by 25-30 (9%), 31-40 (4%), >61 (4%), 51-60 (3%), and 41-50 (1%). This was found by the last two questions of the survey, which asked for the respondents' gender and age.

Two of the survey questions were also analyzed using Marketing Engineering for Excel software. The software ran a segmentation analysis for the respondents and the results of this will be discussed in the next section.

Results

The first four questions in the survey were designed to learn about how many consumers had experienced re-targeted ads, and what their perception was when that happened. The first question asked "Have you ever been scrolling through social media and seen an ad for a product or company that you had just been looking at on a different website?" 91% of the respondents answered "yes," while 2% answered "no" and 7% answered "unsure." Of the 91% who answered "yes", they were brought to a branching question that then asked to rate their feelings when that happened. Overall, the majority of respondents had a neutral or negative experience (Figure 1).

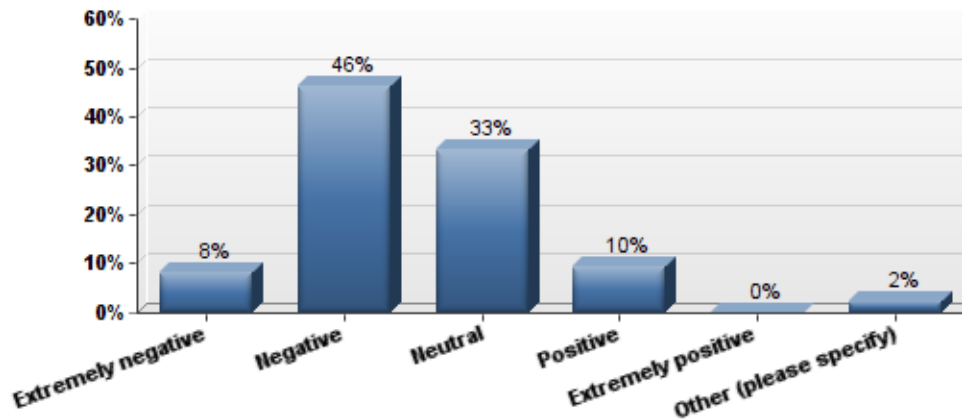
Figure 1

Only 9% had a positive experience and 0% stated that it was extremely positive. Of the 3% who answered “other,” they were asked to specify and their responses can be found in Figure 2.

Figure 2

Other (please specify)
Just sort of creeped out... surprised and a little disturbed
It was weird but didn't think much of jt

Question 3 asked the respondents “Have you ever received advertisements for a product on a website after you had recently purchased that product?” 84% of the respondents answered “yes,” with 2% responding “no” and 14% saying they were “unsure.” Of the 84% who responded “yes,” they were brought to a question that asked them to rate their feelings when that occurred. The results can be found in Figure 3.

Figure 3

Again, the vast majority of respondents (87%) had a neutral, negative, or extremely negative experience when this happened. Only 10% stated a positive experience. Of the 2% who answered “other,” their specified responses can be found in Figure 4.

Figure 4

Other (please specify)
Again, it makes me feel uneasy; like big brother is watching confused

Questions 5 and 6 aimed to see the degree to which marketers should be concerned of consumers turning to ad blockers as online advertising becomes more common and disruptive. Question 5 asked, “Have you ever actively sought out and downloaded advertisement blockers?” 39% answered “yes”, 58% said “no”, and 3% were “unsure.” Of those who responded “no” or “unsure,” they were then asked to rate their interest level in downloading blockers for advertisements or website traffic trackers. The most popular response was neutral with 46%. On one end, 21% were uninterested and 2% were extremely uninterested. On the other end, 31% were interested and 0% was extremely interested. Question 7 asked respondents, “Have you ever stopped shopping

from a particular brand or company because they showed you too many online advertisements?” 36% of the respondents answered “yes,” 57% answered “no,” and 7% were “unsure.”

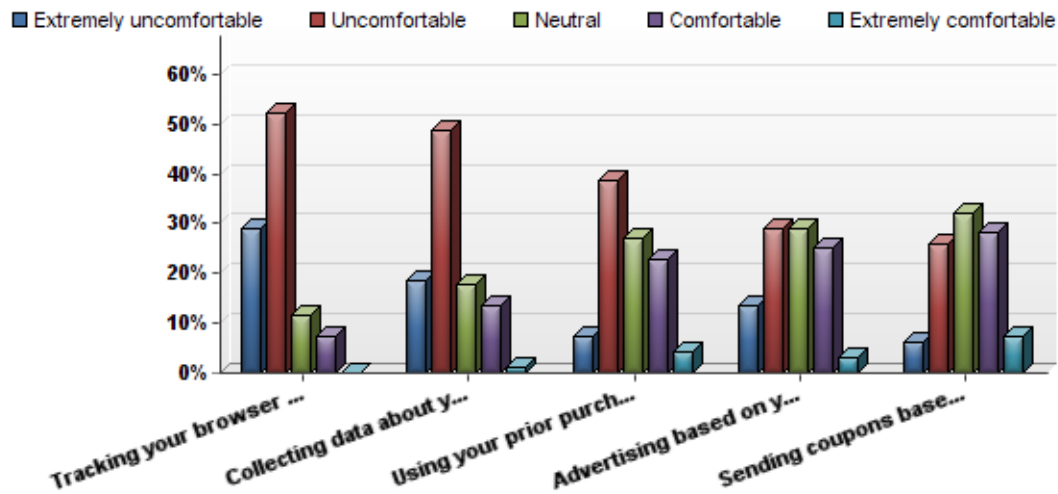
Question 8 asked the respondents to rate their comfort level with companies performing the following practices:

- Tracking your browser and search history
- Collecting data about your purchases and preferences
- Using your prior purchases to advertise similar products
- Advertising based on your location
- Sending coupons based on information about yourself or your past purchases

The results can be found in Figure 5 and Figure 6, as a response table and bar graph, respectively.

Figure 5

#	Question	Extremely uncomfortable	Uncomfortable	Neutral	Comfortable	Extremely comfortable
1	Tracking your browser and search history	28	50	11	7	0
2	Collecting data about your purchases and preferences	18	47	17	13	1
3	Using your prior purchases to advertise similar products	7	37	26	22	4
4	Advertising based on your location	13	28	28	24	3
5	Sending coupons based on information about yourself or your past purchases	6	25	31	27	7

Figure 6

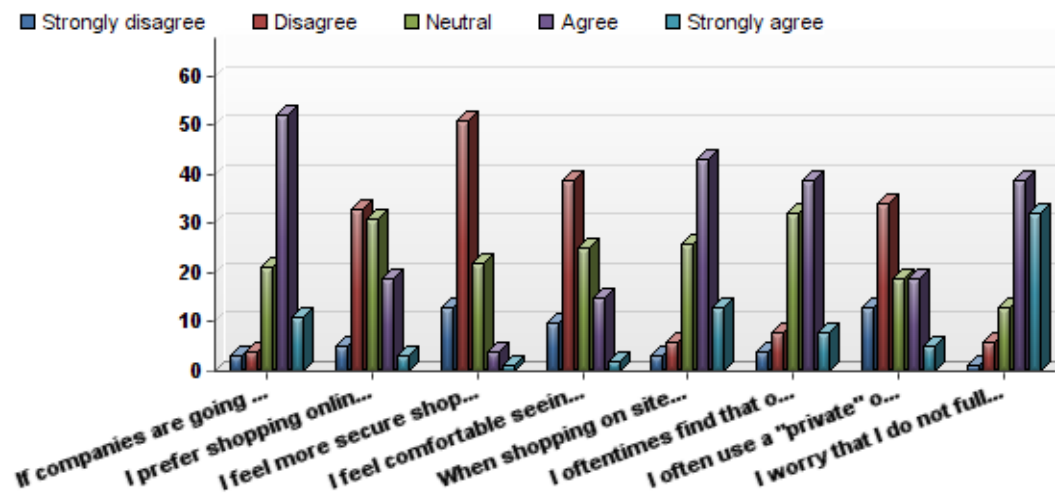
Question 9 asks the respondents to rate their level of agreement with the following statements:

- If companies are going to advertise to me, I prefer the ads are relevant to my interests
- I prefer shopping online than in person
- I feel more secure shopping online than in person
- I feel comfortable seeing ads for products online that I previously viewed on other sites
- When shopping on sites like Amazon, I like that they recommend similar products to ones that I have viewed or purchased
- I oftentimes find that online advertisements are relevant to my interests
- I often use a “private” or “incognito” window because I do not want to be tracked
- I worry that I do not fully understand what data is being collected on me and how it is collected

The results of Question 9 can be found in a table in Figure 7 and bar graph in Figure 8.

Figure 7

#	Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	If companies are going to advertise to me, I prefer the ads are relevant to my interests	3	4	21	52	11
2	I prefer shopping online than in person	5	33	31	19	3
3	I feel more secure shopping online than in person	13	51	22	4	1
4	I feel comfortable seeing ads for products online that I previously viewed on other sites	10	39	25	15	2
5	When shopping on sites like Amazon, I like that they recommend similar products to ones that I have viewed or purchased	3	6	26	43	13
6	I oftentimes find that online advertisements are relevant to my interests	4	8	32	39	8
7	I often use a "private" or "incognito" window because I do not want to be tracked	13	34	19	19	5
8	I worry that I do not fully understand what data is being collected on me and how it is collected	1	6	13	39	32

Figure 8

For questions 8 and 9, an additional segmentation analysis was performed using Marketing Engineering for Excel. The analysis was run on the 90 respondents who answered these two questions. After asking the software to output nine segments and analyzing the dendrogram, the researcher found two distinct segments of consumers, and re-ran the segmentation asking for two outputs. The resulting table can be found in Figure 9. For each question, the segment with the higher value on average is denoted in green, and the lower average is shown in red. It is important to note that each segment had an equal amount of respondents, with 45 respondents in each.

Figure 9

Segmentation Variables			
Means of each segmentation variable for each segment.			
Segmentation variable / Cluster	Overall	Cluster 1	Cluster 2
Search History	1.93	1.53	2.33
Collecting Data	2.29	1.73	2.84
Re-Targeted Ads	2.78	2.2	3.36
Location Ads	2.74	2.24	3.24
Coupons	3.03	2.49	3.58
Relevant Ads	3.7	3.36	4.04
Prefer Online	2.82	2.44	3.2
Secure Online	2.23	1.98	2.49
Comfortable	2.56	1.96	3.16
Similar Products	3.63	3.27	4
Relevance	3.42	3.29	3.56
Private Window	2.66	2.81	2.51
Worried	4.03	4.44	3.62

Figure 10 provides a visual representation of where the respondents fall on average in each segment, and provides the question asked to give the numbers context. Segment one

is shown with the orange stars, which the researcher has labeled “The Skeptics” and segment 2 is denoted with the green stars, which the researched has named “The Acceptors.”

Figure 10

“Please rate your comfort level with companies doing the following:”	Extremely Uncomfortable	Uncomfortable	Neutral	Comfortable	Extremely Comfortable
Tracking your browser and search history		★	★		
Collecting data about your purchases and preferences		★		★	
Using your prior purchases to advertise similar products			★	★	
Advertising based on your location			★	★	
Sending coupons based on information on yourself			★	★	

“Please indicate your level of agreement with the following statements:”	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I prefer advertisements are relevant to my interests				★	★
I feel comfortable seeing ads online for products that I previously viewed on other sites		★		★	
I oftentimes find that online ads are relevant to my interests				★ ★	
I worry that I do not fully understand what data is being collected on me and how				★	★

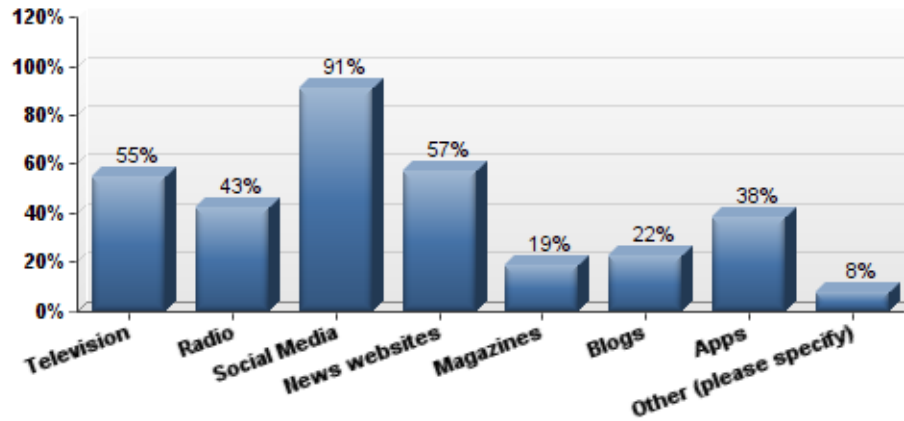
The software also compared these results, which were based off of psychographic data from the survey questions, with discriminant data (the respondents’ gender and age). The hit rate for this was very low at 57.78%. Therefore, there seems to be very little correlation between the demographics of the respondents and how they responded to these two questions; however, as with any sample, the hit rate may be more accurate if the sample size were to increase and be more representative of the population.

Questions 10 and 11 asked about the respondents’ media consumption. Question 10 asked, “What are the ways you primarily consume media? (Check all that apply).” The

top three responses were social media (91%), news websites (57%), and television (55%).

The full responses can be found in Figure 11.

Figure 11



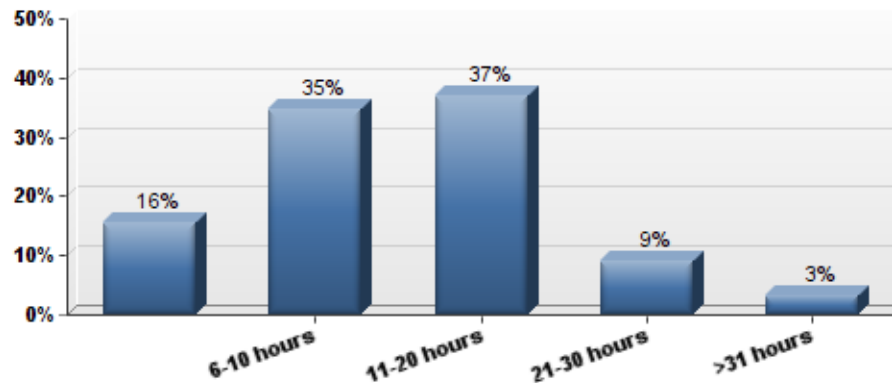
Of the respondents who answered other, their specified responses can be found in Figure

12.

Figure 12

Other (please specify)
Books
Life experience
Newspapers
Podcasts
Newspaper
Stuff
streaming services

The respondents were then asked in Question 11 on average how much time they spend browsing online, combining computer and mobile phone usage. Most respondents answered 11-20 hours, followed closely by 6-10 hours (See Figure 13).

Figure 13

The final two survey questions asked for the gender and age of the respondents, which were discussed in the methodology. The full survey can be found in the appendix.

Discussion

The results from the depth interviews and survey gave much insight into consumer perception of big data and re-targeted ads. The researcher chose to study the consumer perception because from the marketing perspective, re-targeted ads have much potential in becoming increasingly accurate in segmented advertising; however, it is always important to remember consumer perception and if there is a risk of detriment to a brand.

From both the interview and survey results, it is clear that there are mixed responses to the practice of targeted ads. Although some interviewers were more comfortable with the practice and did respond positively to the more accurate advertising, many were uneasy with the practice and this uneasiness was also mirrored in the survey results. Particularly, the fact that 36% of respondents noted they had stopped shopping from a particular store or brand after receiving too many advertisements should definitely raise a red flag to marketers.

It is also important to learn from the segmentation model that just as marketers are segmenting the ads that they send to consumers, they should also be segmenting who receives these ads. The segmentation analysis shows two distinct groups of consumers, so marketers should not be using the same digital marketing strategy for both. Also, marketers are not always successful in making relevant ads, as they advertise products that the consumer already bought or does not want to buy. It is especially crucial to realize that the majority of respondents were aged 18-24, which is a group generally thought of as more accepting of technology and specialized ads. For this reason, Marketers may need to work harder on having more successful campaigns and constantly receiving customer feedback so they can be continuously improving their effectiveness and success.

The field of digital marketing is changing every day. As more and more data is being collected, the methods of sorting and using the data are becoming more refined. As this happens, consumers are seeing the visual representation of marketing efforts as they scroll through various websites and newsfeeds. Although many companies are excited about the potential for this technology, it is important to know that not all consumers are having a positive reaction to these re-targeted ads, and marketers must constantly be monitoring how their brand is being perceived in the mind of their consumers.

References

- Arthur, L. (2013). Big data marketing : Engage your customers more effectively and drive value. Somerset, NJ, USA: John Wiley & Sons. Retrieved from <http://www.ebrary.com>
- Craig, T., & Ludloff, M. (2011). *Privacy and big data*. Sebastopol, CA: O'Reilly Media.
- Fulgoni, G. (2013). Big data: friend or foe of digital advertising? Five ways marketers should use digital big data to their advantage. *Journal Of Advertising Research*, 53(4), 372-376.
- Frampton, M. (2014). A definition of "big data" In *Big data made easy: A working guide to the complete Hadoop toolset*. Apress.
- Gudivada, V., Baeza-Yates, R., & Raghaven, V. (2015). Big data: promises and problems. *IEEE Computer Society*, 20-23.
- Hurwitz, J., & Nugent, A. (2013). *Big data for dummies*. Hoboken, N.J.: Wiley.
- Meiser, R. (2015). BIG DATA. *Shopping Centers Today*, 36(7), 34-37.
- Nagode, L., Mantha, V., Licht, A., & Stackowiak R. (2015). Broad future state considerations. In *Big data and the internet of things: Enterprise information architecture for a new age*. Apress.
- Tirunillai, S., & Tellis, G.J. (2014). Mining marketing meaning from online chatter: strategic brand analysis of big data using latent dirichlet allocation. *Journal of Marketing Research (JMR)*, 51(4), 463-479
- Tene, O., & Polonetsky, J. (2012). Privacy in the age of big data: a time for big decisions. *Stanford Law Review*, 1-7

Appendix

Marketing Analytics Survey

Dear reader:

If you agree to participate in this study, you will be asked to complete an online survey, which should take approximately 5 minutes of your time. You will not receive any compensation to participate in this project. The potential risks of participating in this study are minimal. Although you are not anticipated to receive any direct benefits from participating in this study, the benefits of the knowledge gained are expected to enlighten businesses on how their consumers perceive certain practices, and whether they should consider adjusting some of their practices to better satisfy the wants of their customers. Participation in this study is strictly voluntary. If you refuse to participate, you will not experience any penalty or negative consequences. If you agree to participate, you may refuse to answer any question and/or if you change your mind, you may withdraw at any time during the study without penalty or negative consequences. I seek to maintain the confidentiality of all data and records associated with your participation in this research. Any communication via the Internet poses minimal risk of a breach of confidentiality. I will keep data on a password-protected computer; only my faculty advisor, Billur Akdeniz, and myself will have access to the data. I will report the data in aggregate form. The results will be used in a research report, and will also be presented at the UNH Undergraduate Research Conference in April 2016. If you have any questions about this research project or would like more information before, during, or after the study, you may contact Julia Hopkins by phone at (603) 703-3169 or via email at juliahopkins18@gmail.com. If you have questions about your rights as a research subject, you may contact Dr. Julie Simpson in UNH Research Integrity Services at 603-862-2003 or Julie.simpson@unh.edu to discuss them.

Sincerely,

Julia Hopkins
UNH Student '16

Q1 Have you ever been scrolling through social media and seen an ad for a product or company that you had just been looking at on a different website?

- ☐ Yes (1)
- ☐ No (2)
- ☐ Unsure (3)

If No Is Selected, Then Skip To Have you ever received advertisements...If Unsure Is Selected, Then Skip To Have you ever received advertisements...

Q2 Please rate your feelings when that happened: (referring back to "Have you ever been scrolling through social media and seen an ad for a product or company that you had just been looking at on a different website?")

- ☐ Extremely negative (1)
- ☐ Negative (2)
- ☐ Neutral (3)
- ☐ Positive (4)
- ☐ Extremely positive (5)
- ☐ Other (please specify) (6) _____

Q3 Have you ever received advertisements for a product on a website after you had recently purchased that product?

- ☐ Yes (1)
- ☐ No (2)
- ☐ Unsure (3)

If No Is Selected, Then Skip To Have you ever actively sought out and...If Unsure Is Selected, Then Skip To Have you ever actively sought out and...

Q4 Please rate your feelings when that happened (referring back to "Have you ever received advertisements for a product on a website after you had recently purchased that product?")

- ☐ Extremely negative (1)
- ☐ Negative (2)
- ☐ Neutral (3)
- ☐ Positive (4)
- ☐ Extremely positive (5)
- ☐ Other (please specify) (6) _____

Q5 Have you ever actively sought out and downloaded advertisement blockers?

- ☐ Yes (1)
- ☐ No (2)
- ☐ Unsure (3)

If Yes Is Selected, Then Skip To Please rate your comfort level with c...

Q6 How interested are you in downloading blockers for advertisements or website traffic trackers?

- ☐ Extremely uninterested (1)
- ☐ Uninterested (2)
- ☐ Neutral (3)
- ☐ Interested (4)
- ☐ Extremely interested (5)

Q7 Have you ever stopped shopping from a particular brand or company because they showed you too many online advertisements?

- ☐ Yes (1)
- ☐ No (2)
- ☐ Unsure (3)

Q8 Please rate your comfort level with companies doing the following:

	Extremely uncomfortable (1)	Uncomfortable (2)	Neutral (3)	Comfortable (4)	Extremely comfortable (5)
Tracking your browser and search history (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collecting data about your purchases and preferences (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using your prior purchases to advertise similar products (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advertising based on your location (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sending coupons based on information about yourself or your past purchases (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 Please indicate your level of agreement with the following statements:

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
If companies are going to advertise to me, I prefer the ads are relevant to my interests (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer shopping online than in person (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel more secure shopping online than in person (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable seeing ads for products online that I previously viewed on other sites (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When shopping on sites like Amazon, I like that they recommend similar products to ones that I have viewed or purchased (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I oftentimes find that online advertisements are relevant to my interests (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often use a "private" or "incognito"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>window because I do not want to be tracked (7)</p> <p>I worry that I do not fully understand what data is being collected on me and how it is collected (8)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Q10 What are the ways you primarily consume media? (Check all that apply)

- ☐ Television (1)
- ☐ Radio (2)
- ☐ Social Media (3)
- ☐ News websites (4)
- ☐ Magazines (5)
- ☐ Blogs (6)
- ☐ Apps (7)
- ☐ Other (please specify) (8) _____

Q11 On average, how much time a week do you spend browsing online? (on your computer and mobile phone combined)

- ☐ (1)
- ☐ 6-10 hours (2)
- ☐ 11-20 hours (3)
- ☐ 21-30 hours (4)
- ☐ >31 hours (5)

Q12 What is your gender?

- ☐ Male (1)
- ☐ Female (2)
- ☐ Other (3)

Q13 What is your age?

- ☐ (1)
- ☐ 18-24 (2)
- ☐ 25-30 (3)
- ☐ 31-40 (4)
- ☐ 41-50 (5)
- ☐ 51-60 (6)
- ☐ >61 (7)