



PhD Thesis

## **I think therefore I am...?**

An exploration of artificial intelligence (AI) marketing  
practitioner perceptions and practices

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## DOCTORAL THESIS

Title	<i>I think therefore I am...</i> An exploration of artificial intelligence (AI) marketing practitioner perceptions and practices
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## Abstract

"I think, therefore I am...? An exploration of artificial intelligence (AI) marketing perceptions and practices", Bant Breen, Ph.D. thesis supervised by Pere Masip Masip, from Blanquerna School of Communications and International Relations, 2019.

This thesis explores perceptions of artificial intelligence (AI) by the advertising industry and contrasts those perceptions with the state of AI marketing development today. The advertising industry is an interesting focal point for a discussion regarding AI because it is one of the emblematic creatively focused industries, and creative is often viewed as an area where machines can only copy or support and not ideate.

Artificial intelligence (AI) is the intelligence exhibited by machines. In computer science, an ideal "intelligent" machine is a flexible rational agent that perceives its environment and takes actions that maximize its chance of success at an arbitrary goal (Russell and Norvig, 2003).

AI technology developments are changing society. Some are small improvements like Google's AI enhancements in its' Gmail product that makes it easier and faster to respond to messages. Others are on-going shifts like Tesla's version iterations to autonomous vehicle software. And even others such as Echo, Amazon's voice-activated personal assistant for your home, begin to make AI-enabled machines part of daily life. In the media space, Facebook's Founder and CEO Mark Zuckerberg offers chat-bots in their instant messaging platform that speak to consumers for brands.

In the advertising and marketing world, artificial intelligence is starting to be more than a science fiction topic or a nifty copy strategy. Creatives, media executives, and AdTech entrepreneurs are actively exploring AI. In 2016, the advertising firm McCann announced that their Japanese youth division titled McCann Millennials had built and was using an AI creative director (Doland, 2016).

In contrast to the movement towards AI, several legendary ad creators remain firmly committed to the idea of the individual creative human being staying solely at the center of the media and marketing creative process. In recent years, legendary ad executive Sir John Hegarty, defended the critical role humans play to reason and curate and ultimately create great marketing (Arthur, 2016).

The primary research for the thesis is a survey of key stakeholders in the advertising and marketing world on the topic of artificial intelligence. After fielding the questionnaire, a smaller set of respondents participated in follow-up interviews to expand their opinions on various areas of the survey.

This thesis explores the topic of artificial intelligence in marketing and the perception of AI by marketers. The results show an industry cautiously interested in AI and its potential, but woefully unaware and unprepared for the challenges this technological leap-forward presents. The majority of participants in the study highlighted their limited understanding of AI. Out of the 440 respondents, the vast majority of the data fell in the lowest quartile, being in the 3/3.5 range out of 10. When asked how creative AI can be,

participants consistently responded negatively, with an average of 3.0 on a scale of 1 to 10 in terms of how creative AI can become. When asked what jobs AI can replace, roles that received the highest number of mentions for "cannot be replaced by AI" were mostly creative, strategic or leadership. An astounding 82% of respondents said their companies did not offer training in AI.

This thesis wrestles with the luddite and progressive perspectives of AI in marketing and the machine-learning breakthroughs that challenge the role of the marketing department and advertising industry.

## **Dedication**

To my wife Carmen, thank you for your love and, as a fellow author, empathy through the process of envisioning and writing this thesis.

&

To Alejandro and Nico, my clever and creative sons who will be part of the generation that fully embraces artificial intelligence in their lives and work.

## Acknowledgement

Five years ago, Dean Carbonell invited me to guest lecture at Blanquerna. At the time, I had no idea that someday I would be completing a thesis at this esteemed institution. I am grateful for the opportunity to learn, work, and collaborate with the talented faculty and student body of this university.

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All research projects require hours of work on data processing, list management, and analysis. Thanks go to my Qnary colleagues Ranjitha Arulmani and Marc Reichel for generously assisting me in the survey data management as well as the email campaign to survey respondents. Also, I am grateful for the sage, analytic counsel of my professional marketing research colleague Sarah Ivey. Lastly, I also want to thank author Jim Sterne for taking the time to speak with me and also to share his book with me.

I want to thank my father Dr. T.H. Breen who taught me to value and respect the world of education, research, and scholarship. And to my late grandfather Dr. George Breen who wrote some of the seminal books about marketing research and taught me how to understand and interpret customer data. Wow, to think what he would have thought of the emerging world of AI...

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# Introduction

## *0.1 Artificial Intelligence (AI) Changes Everything*

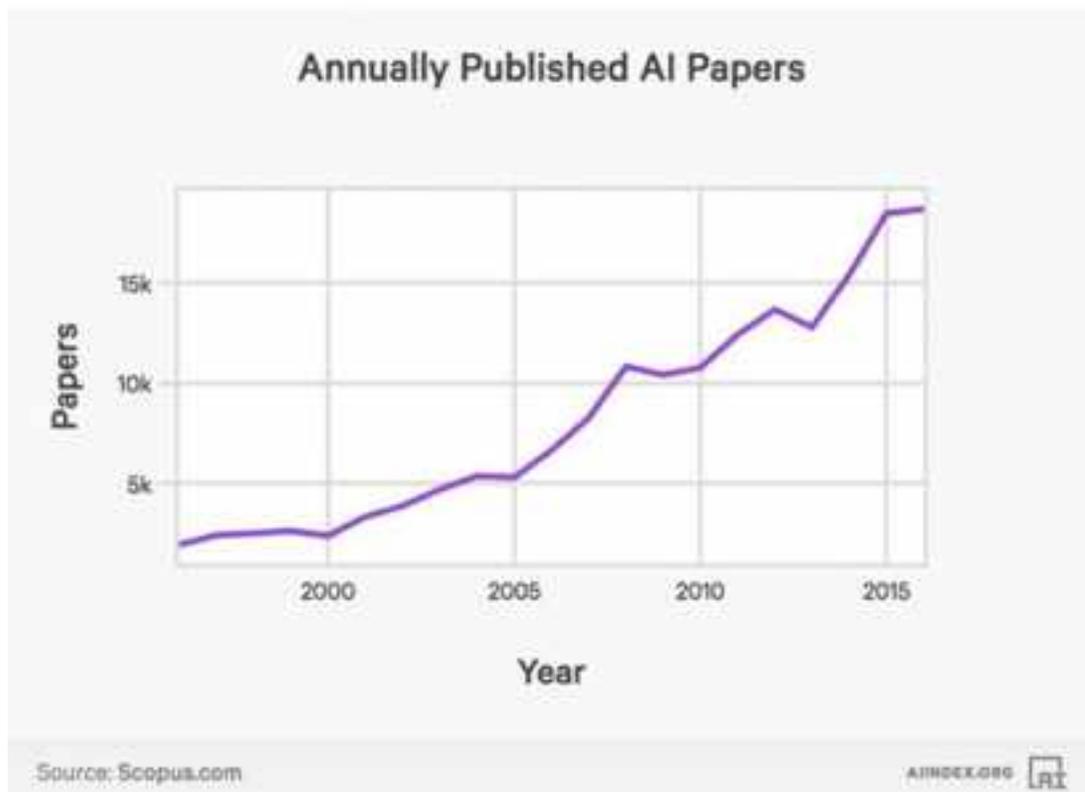
"AI is the new electricity!" exclaimed leading AI-focused computer scientist and entrepreneur Andrew Ng at the 2017 AI Frontiers Conference (Wharton, 2017).

This bold proclamation uttered by one of the more accomplished machine-learning focused professionals captures the magnitude of how many business leaders see AI. Ng is an adjunct professor at Stanford University and the founder of Coursera, a leading AI-enabled education company. He was the co-founder of Google Brain and Chief Scientist at Baidu overseeing some of this most groundbreaking AI solutions. Ng's statement plays a secondary role, as well. His words act as an encapsulation of the transformation that AI will have on our world, including the advertising industry.

While the definition of AI by advertising professionals will be reviewed later in this thesis for the general purposes of framing this introduction, AI is the intelligence exhibited by machines. In computer science, an ideal "intelligent" machine is a flexible, rational agent that perceives its environment and takes actions that maximize its chance of success at an arbitrary goal (Russell and Norvig, 2003:55).

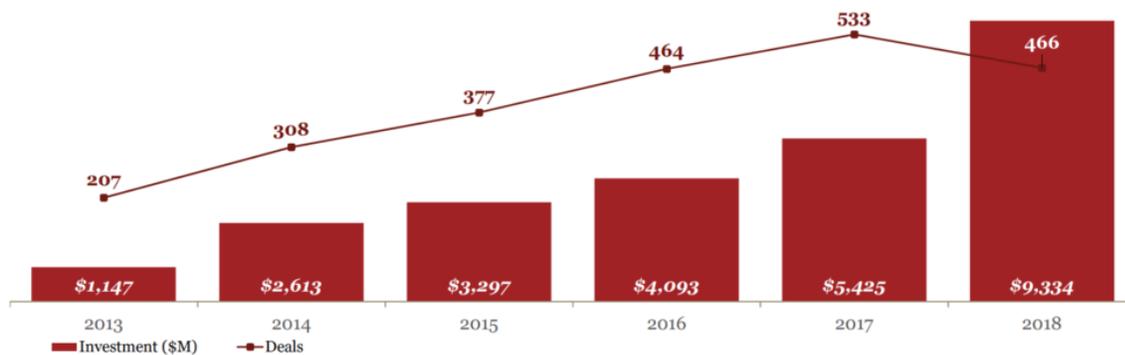
AI research and development activities are increasing in an accelerated fashion. As an academic-gauge, consider that AI papers in Scopus, Elsevier's abstract and citation database, have increased 7x since 1996 (Chart .1) (AI Index, 2018).

Chart .1: Annually Published Papers on AI (AI Index, 2018)



On the investment front, VC funding into US artificial intelligence startups grew 72% year-over-year, hitting over \$9.3B in 2018 (Chart .2) (CB Insights, 2018). Also, the general usage of AI-related products continues to surge. IHS Markit, a business information provider, found that 4 billion devices have AI-powered assistants, and this number will reach 7 billion by 2020 (Yoshino, 2017).

Chart .2: VC funding into US artificial intelligence startups (CB Insights, 2018)



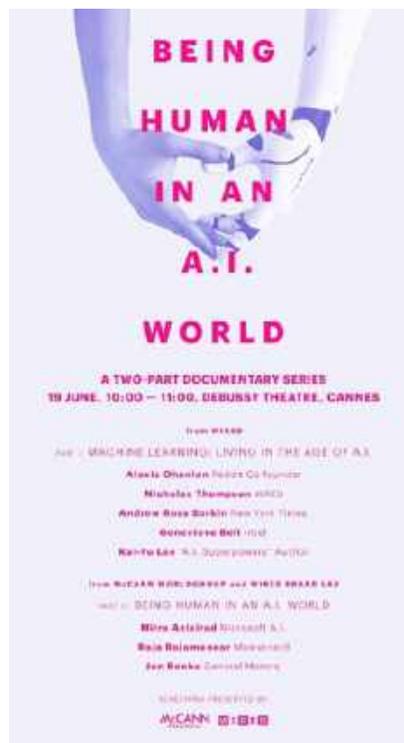
The growth of AI has led to cataclysmic predictions on topics such as employment. Leading consultancy McKinsey forecasts that up to 800 million global workers will lose their jobs by 2030 to AI-driven robotic automation. The study conducted in 46 countries and across 800 occupations found that up to one-fifth of the global workforce will be affected. One-third of the workforce in Germany and the US may need to retrain for other jobs (BBC, 2017).

The advertising industry's perspective on AI reflects mostly the excitement around recent machine-learning innovation and a bit of fear related to the potential challenges

AI present to society. The Cannes Lions International Festival of Creativity is the global advertising community's most prestigious annual gathering and awards show. Since 1954, leading marketing clients, agency creatives, and AdTech executives come to the Lions to view the world's most exceptional marketing work (Cannes Lions, 2019). The Festival also offers marketing professionals a chance to discuss the critical topics that are redefining the advertising business today.

At the 2019 edition of the Festival, the goliath agency McCann partnered with the technology 'zeitgeist' publication Wired Magazine to produce a two-part documentary about Artificial Intelligence titled 'Being Human in an AI World' (Image .3) (Cannes Lions, 2019).

Image .3: McCann/Wired Magazine AI Documentary (Cannes Lions, 2019)



McCann's Global Chief Digital Officer, Sean MacDonald, outlined, "AI is a predominant topic in today's media. It's top-of-mind for global corporations and for our clients, but there's no obvious or clear path for how this technology will affect their businesses and people (McCann Worldgroup, 2019)." The McCann Wired AI-series provides an exciting overview of how AI and all of its elements will sweep in profound change across all business categories.

To viewers, such programs are exciting and unsettling at the same time. The two episodes foreshadow a power shift between humans and artificial intelligence. Jess Cartner-Morley, one of the editors of *The Guardian*, explains this sense of foreboding perfectly. Cartner-Morley writes, "We sense the robots creeping up on us, and we imagine them breathing down our necks (unlikely, what with them having no need of respiration, but still) and we worry about how we will compete. And the more artificial intelligence advances into those areas of our thinking that we experience as creative and emotional, the more spooked we get (Cartner-Morley, 2018)."

Cartner-Morley paints a picture of AI progressing towards sentient behavior and raises a question that philosopher, mathematician, and scientist Rene Descartes and many other scholars pondered. Descartes' *Discourse on the Method* published in 1637 argued that the act of doubting one's existence served as proof of the reality of one's mind; there must be a thinking entity for there to be a thought. This idea is simplified today to 'the cogito' or the phrase that is also the referential title of this thesis, "I think; therefore, I am (Haldane and Lindsay, 2016:12)."

Many leaders and scholars today are not asking the question if AI will reach a level that it displaces labor, but when, and what that will mean for civilization. Former US President Obama warned of the impact that this new age of automation will have on jobs. "The next wave of economic dislocations won't come from overseas," Obama said. "It will come from the relentless pace of automation that makes a lot of good, middle-class jobs obsolete (Miller, 2017)." Carl Benedikt Frey's and Michael A. Osborne's exploration of how susceptible US jobs are to AI automation support Obama's statement. The study showed that 47 percent of total US employment is at risk (Frey and Osborne, 2013:1). Jobs will disappear, but more importantly, the fundamental existence and purpose of humanity come into question.

The ad industry is an intriguing professional group to examine regarding the impact of artificial intelligence because advertising is a creatively-fueled business filled with artists, copywriters, graphic designers and professionals with dominant right-brain thinking. The advertising industry is a bellwether for all creative professions. Ad Industry pundits imagine clerical marketing tasks completed by AI machines, but believe the ability to imagine and innovate remains the domain of human creative ad executives. Ithamar Sorek, the founder of AdTech shop ReFuel4, explained, "AI can truly pull the disparate agency roles together – churning through vast amounts of data, identifying gaps, and deciding on creative direction – enabling us to focus on what we do best: being creative (Sorek, 2017)." Sorek sees that AI can assist humans with creative, but he stops short of considering AI-generated ideas as equal to human ingenuity.

The ability to be creative appears to be the cognitive skill that keeps humanity relevant in the economy of 2020 and beyond. The World Economic Forum conducted a study on the impact of artificial intelligence on the nature of work. The WEF's Council found that creativity will become one of the top three skills workers will need. With the avalanche of new products, new technologies, and new ways of working, workers are going to have to become more creative to benefit from these changes. By 2020 negotiation and flexibility will begin to drop from the top ten as machines, using masses of data, begin to make our decisions for us (World Economic Forum, 2016:20-25). Artificial Intelligence will transform the way we live and the manner we work; some jobs will disappear, others will grow or transform, and jobs that do not even exist today will become commonplace. What is certain is that the future workforce will need to align its skillset to keep pace (Gray, 2016). A study of artificial intelligence and the advertising industry provides an extraordinary glimpse into the potential impact, and threat machines will have on creative disciplines. It also shines a light on how creativity in the context of advertising will evolve and adapt.

Alan Turing's question, "Can machines think" as well as Ray Kurzweil's prediction of AI surpassing human intelligence provides this thesis' focus (Turing, 1950) (Kurzweil, 2005). Turing's efforts led to a long, bumpy history of scientists and engineers working to build machines that showed glimpses of artificial intelligence. Susan Etlinger's recent overview of the history of AI highlights some of these critical milestones (Etlinger, 2017:6). The success of IBM's Deep Blue chess-playing machine and, more recently,

IBM's Watson Jeopardy playing machine answered the question could a machine think (Miller, 2011).

Even with all of these AI breakthroughs advertisers and marketers remain at least partially resistant. AI venture capitalist and former ad executive, Sarah Fay, writes, "Most (advertising professionals) hang on to the belief that creativity and ideas are still the human domain, and that someone will need to drive the AI bus (Fay, 2017)."

Highlighting Fay's point, the agency David Miami created a campaign mocking AI and machine learning for Burger King (Image .4). Each video begins "This ad was created by artificial intelligence," before devolving into nonsensical imagery and hilarious gibberish. In fact, AI created none of the ads. Burger King expanded the campaign into social media.

Image .4: Burger King Tweet (Greene, 2018)



Many industry trade journals and agency executives came out in support of the comic spots that poke fun at AI. One review states, "The humans who wrote these commercials are hilarious if you ask us, and no machine is even close to this level of creativity ... yet (Greene, 2018)." Agency creative director Jade Trott wrote, "We might laugh at those silly AI Burger King ads, because they're relatable to every whoopsie we've experienced with Alexa or Siri. But, even these ads were constructed by humans – as Burger King's head of brand marketing so succinctly put it: "Artificial intelligence is not a substitute for a great creative idea coming from a real person (Trott, 2018)." Arguably, it is as Kurzweil says, "as long as there is an AI shortcoming in any such area of endeavor, skeptics will point to that area as an inherent bastion of permanent human superiority over the capabilities of our own creations (Kurzweil, 2005:8-9)."

Conversely, many agencies are beginning AI-enabled creative solutions. In November 2018, automaker Lexus made the first commercially scripted ad by AI (Image .5) (Griner, 2018).

Image .5 Lexus AI Commercial (Griner, 2018)



The 60-second spot was directed by Oscar-winner Kevin Macdonald, working from a script that was developed by IBM's Watson AI system. To produce the spot for the Lexus ES executive sedan, the automaker enlisted creative agency, The&Partnership London, along with technical partner Visual Voice.

The agencies, with IBM Watson used AI to analyze 15 years of video footage, text, and audio for car and luxury brand campaigns that won Cannes Lions awards. The team, in addition, reviewed a range of other external data. Watson identified elements common to award-worthy commercials that were "both emotionally intelligent and entertaining," according to IBM (Spangler, 2018).

As some marketers stubbornly ignore AI, and other ad practitioners start to experiment, Kurzweil's timeline of a thinking machine shortens. Kurzweil states, "2029 is the consistent date I have predicted for when an AI will pass a valid Turing test and therefore achieve human levels of intelligence. I have set the date 2045 for the 'Singularity' which is when we will multiply our effective intelligence a billion fold by merging with the intelligence we have created (Reedy, 2017)."

## *0.2 Thesis Methodology, Objective & Structure*

In many ways, this thesis contemplates the same question that Descartes, Turing, and Kurzweil mulled over, but also explores the query in the context of advertising and

marketing. How far can AI go to support and then ultimately replace the functions of an advertising practitioner?

The thesis utilizes a mixed methodology combining quantitative and qualitative data to provide deeper dimensional understanding and insight into the research topics (Bowen, Rose, Pilkington, 2017). The thesis first examines the results of the primary robust quantitative research study on the perceptions of AI in media and marketing. It then compares and contrasts that with a broad qualitative review of AI and all the issues raised in the quantitative analysis.

The thesis uncovers a divergence between marketing practitioner perceptions of AI and the reality of its' marketing potential today. This parting only widens when reviewing human versus AI-generated creativity. Lastly, looking forward, those who responded to this thesis remain committed to human primacy while faced with overwhelming evidence of the advance of AI capabilities.

This thesis offers a glimpse of where the advertising and marketing business is in terms of its understanding, usage, fears, hopes, and plans for AI. One examines the topic of creativity, a skill held in high regard in the advertising arena and thought to be the human trait hardest to mimic by AI. The dissertation also looks outside of the industry to see where we are on the pathway of AI marketing development in the context of broader societal changes and implications.

The extensive research supporting this thesis draws from survey results, interviews, academic journals, trade press publications, industry research surveys, corporate whitepapers, and marketing-focused books about AI. The primary research for this thesis focused on a survey for key stakeholders in the advertising and marketing world on the topic of artificial intelligence.

The thesis research explored seven areas of inquiry to better understand the state of understanding and preparedness for AI in the field of marketing and advertising.

#### Objective 1: Level of understanding

The first area of inquiry was to establish the general level of understanding and knowledge of AI across the advertising and marketing industry in order to put the rest of the survey in context.

#### Objective 2: Specific applications of AI

The second area of inquiry was to probe for examples of current applications of AI, and to get a detailed sense of which tasks and roles AI could impact.

#### Objective 3: Creativity and AI

The third area of inquiry tested the industry's views of how truly creative AI could be, particularly in context of the creation of advertising and innovative thinking.

#### Objective 4: Marketing Employment and AI

The fourth area of inquiry probes in detail the macro and marketing specific impact of AI on employment and organizational structure.

#### Objective 5: Ethical considerations

Ethical considerations are inevitable in any discussion about AI, and this area of inquiry probes what concerns are topmost with the respondents.

#### Objective 6: Education and AI

Education and remaining knowledgeable in the field of AI will likely be a concern with many respondents. This area of inquiry probes topics of interest and available resources in AI education.

#### Objective 7: The Future of AI

Finally our last area of inquiry focused on the respondents' overall view of the future of AI and its impact on the industry.

This survey went to a statistically-significant sample size of advertising agency executives, marketing executives at Fortune 500 companies, and technology executives. Some survey participants agreed to follow-up interviews to get them to expand their opinions on various areas of the survey.

To supplement and evaluate the quantitative research, one examined a myriad of other sources, including research papers and surveys. There is quite a bit of ongoing

research into all areas of AI. This thesis looks at the canon of knowledge concerning AI-related computer science and engineering, business, social science, law, government, and economics. This thesis does not dwell deeply on the scientific details of AI, but it is vital to consider them when outlining how AI, as a holistic subject, is impacting the advertising industry.

The technological development of AI is moving at a feverish pace. Groups such as Google DeepMind are doing leading-edge work in supervised learning. Supervised learning requires data labeling before processing. For example, one might train a computer with 500,000 photos that are tagged "fruit" and "apple," and 500,000 each of other objects. When one shows the computer an unlabeled photo of an apple, it will attempt to classify it based on the categories it knows. A type of supervised learning in which the computer trains itself continually using trial and error to improve its outcomes is called reinforcement learning. Google DeepMind uses this technique to train its AI program, AlphaGo (Mix, 2017).

Unsupervised deep learning offers some of the most exciting avenues for further research. Deep learning is a branch of unsupervised learning. It consists of running data through an artificial "neural network"; basically, a software program that roughly simulates the behavior of neurons in the brain. Deep learning translates things people can easily perceive into something computers can recognize and interpret (Simonite, 2016).

Economists provide an enlightening perspective on the AI age. Jeffrey Sachs' analysis of the impact of AI on the new US economy highlights troubling concerns and positive fixes. "A careful theoretical analysis reveals a stark truth: Smart machines could actually set in motion a downward spiral, wherein today's young workers can't find decent jobs, and thereby cut back on their saving, which in turn leaves the following generation of young workers even worse off." Sachs balances this stark perspective with a more optimistic view. "Suppose that singularity indeed arrives, so that robots and expert systems really do perform all the unpleasant and humdrum work of the economy. If fiscal policies ensure that everybody, young and old, can share in the bounty, the results could be a 21st- century society in which we have much more time – and take more time – to learn, study, create, innovate, and enjoy and protect nature and each other (Sachs, 2017:49)."

Oxford University has become a hotbed of thought leadership in the AI space. Carl Benedikt Frey's and Michael Osborne's research on the future of employment provides some needed benchmarks to evaluate the results of our doctoral research. Frey and Osborne argue that, "about 47 percent of total US employment is at risk." (Frey and Osborne, 2013:38). One area examined in this thesis is the relationship that AI has with mapping or mirroring human creativity, an attribute highly valued in the advertising industry. Frey and Osborne take an optimistic view of the future of creative professions. "Because creativity, by definition, involves not only novelty but value, and because values are highly variable, it follows that many arguments about creativity are rooted in disagreements about value. Thus, even if we could identify and encode our creative

values, to enable the computer to inform and monitor its activities accordingly, there would still be disagreement about whether the computer appeared to be creative. In the absence of engineering solutions to overcome this problem, it seems unlikely that occupations requiring a high degree of creative intelligence will be automated in the next decades (Frey and Osborne, 2013:26).”

There has been a myriad of research studies and projects on the relationship between creativity and AI. Margaret Boden's research into human creativity provides a format to compare advances and developments in AI. Her analysis of different types of creativity allows one to start building gradations of creativity and how AI might impact those varying degrees of creativity (Boden, 2004).

Roelof Pieters and Samim Winiger's article "CreativeAI: On the Democratisation & Escalation of Creativity," provides an excellent overview of the history of AI and creative endeavors. The article highlights all research projects such as Vannevar Bush's Memex from 1949, a desk-like device where people could search through a library of articles through a series of switches, to the latest examples of generative creative with research project acronyms such as VAE, DRAW, VRNN, GAN, DCGAN, LAPGAN, and GRAN. These generative models allow us to map complexity with higher resolution and apply modeling techniques to a broader range of creative problems (Pieters and Winiger, 2016).

To provide an accurate read on where we are today the thesis highlights many examples of current AI creative work such as projects like "Daddy's Car," a song in the style of the Beatles, that is reputed to be the first song written by AI (Goldhill, 2016).

Leading research companies, technology businesses, and consultancies published research studies on AI and its' impact on the enterprise in the last ten years. One compared and contrasted the survey results from this thesis with reports from organizations such as McKinsey and Gartner.

The daily trade press of the advertising, media, digital technology industries provided a rich vein of material to review when evaluating the industry perception of AI and the latest milestones.

While individuals will be able to extrapolate from the findings and make inferences about other creative professions, the main limitation of this research is that it focused on one industry. The aim is to utilize the ad industry as a focal point because it is one of the emblematic, creatively-focused industries.

Lastly, the study focuses on the US market and will reflect the unique qualities of the US advertising marketplace. The leading global advertising market in terms of spend is the United States. The country invested nearly 229.7 billion U.S. dollars in promotional activities in 2018. This figure is roughly two and a half times higher than that of its closest competitor, China, which in comparison only spent 87 billion dollars that year

(Guttmann, 2019). Further exploration will be warranted to compare the findings on a global basis.

This thesis provides invaluable information and analysis that will help professionals capture the perception of how AI will impact the ad industry. The information helps ad agencies, marketing departments, advertising professionals, entrepreneurs, AI Ad-tech specialists, and others formulate more effective AI solutions. It also provides a glimpse into the creative professional mind and how they embrace and fear the AI future.

The story of AI and Advertising is far from over, and the goal is to have a research study that can be repeated on an annual basis. Post-thesis, the research will be able to continue with a second and third edition and provide the baseline for ongoing study of the topic of AI and advertising.

### *0.3 Chapter Overview*

The chapter overview of the thesis is as follows:

**Chapter One** provides a thorough review of the methodology utilized for the primary research.

**Chapter Two** provides a thorough review of the results of the primary survey.

**Chapter Three** explores the collective definition of AI highlighted in the survey as well as the survey participants' understanding of AI in the context of the history of AI.

**Chapter Four** looks at where AI appear in marketing and the role that advertising professionals imagine it has today.

**Chapter Five** delves into the topic of AI's ability to play a role in the creative realm of advertising and marketing and how practitioners are resisting and welcoming AI activity.

**Chapter Six** reviews one of the biggest human fears related to AI, which is employment and talent.

**Chapter Seven** reviews the ethical concerns about AI raised by ad practitioners and AI computer scientists in the thesis.

**Chapter Eight** outlines the status of education of AI in the marketing industry.

**Chapter Nine** looks at the ad practitioners' perceptions of the AI future counterbalanced with the thoughts of leading AI thinkers.

**Chapter Ten** provides a summation of the findings of the thesis and critical insights that provide a baseline of understanding of where the advertising industry views itself to be in terms of AI.

The thesis structure starts by explaining the methodology and outlining the core findings from the scaled, primary research study. The following chapters explore the topics raised in the survey in greater depth and offer a chance to compare and contrast results from the survey. Chapter ten provides an overarching review of all of the key findings of the thesis and critical insights.

## 0.4 Summary

The thesis shines a light on the limited movement toward understanding and embracing AI in the advertising industry. Some ad execs show excitement for AI, but they have low levels of awareness, understanding, and training in all areas of AI. Survey respondents highlighted a need and showed a desire to learn more about customer data which is a building block for AI. Perhaps when data-infused marketing becomes better understood and practiced, advertisers will then move forward in the field of AI-enabled marketing.

Critical topics for a talent-focused industry like advertising, such as 'upskilling' seem completely absent even with large technology players and startups offering free solutions to support the effort. Any interest in AI remains tempered by the fear of the AI depicted in Hollywood movies and amplified by sensational press editorials.

Several ad groups are in the early stages of experimenting with AI in all channels, and hundreds of AdTech-related startups promote their AI prowess. However, no marketing group appears to be implementing wholesale change based on AI.

Today, based on the survey results, advertising practitioners believe that one can be supported by artificial intelligence to sort and sift and work more efficiently but to cogitate, to have the next "big idea" you still must be human. The dystopian vision of general artificial intelligence taking all jobs is still perceived to be far away for marketers. There is a need to rescript this negative Hollywood version of the future. If the ad

industry takes a proactive approach to restructure for AI ethically and humanely, it can create an ad partnership between human and machine with immense benefits for society.

# Chapter 1. Methodology of the Thesis Research

## *1.1 Introduction*

The thesis utilizes a mixed methodology combining quantitative and qualitative data to provide deeper dimensional understanding and insight into the research topics (Bowen, Rose, Pilkington, 2017). The thesis first examines the results of the primary robust quantitative research study on the perceptions of AI in media and marketing. It then compares and contrasts that with a broad qualitative review of AI and all the issues raised in the quantitative analysis. This sequential explanatory approach/ strategy provides a multi-dimensional perspective on a complex and rapidly changing topic.

The thesis research starts with a quantitative data study that was informed by qualitative topical background reading and discussions on AI as well as reading on setting up mixed methodology studies (Schoonenboom and Johnson, 2017). The quantitative work is then compared and contrasted against a qualitative review of the main topics raised

in the quantitative data. As Creswell and Plano Clark outline there are four major features that help one understand the decisions and characteristics of mixed methods: purpose (or intent) for mixing, sequencing of qualitative and quantitative strands, priority (dominance) of each method, and level of interaction between each strand (Walker and Baxter, 2019). While this thesis does provide a level of dominance to the quantitative research study, the exhaustive qualitative review of the objectives provides a much deeper understanding of the topics and provides ample fodder to compare and contrast the findings.

The quantitative research for this thesis centers around a survey that solicited the perceptions of artificial intelligence by advertising practitioners. The discussion about the quantitative research will cover:

- Objectives of the research and areas of inquiry;
- Survey question types;
- A detailed overview of the fieldwork;
- A detailed overview of the respondents.

The qualitative research will cover:

- Interviews conducted with selected survey respondents
- Trade press and AI infused marketing campaign analysis

### *1.2 Objectives of the Research and Areas of Inquiry*

The thesis research explored seven areas of inquiry to better understand the state of understanding and preparedness for AI in the field of marketing and advertising.

### Objective 1: Level of understanding

The first area of inquiry was to establish the general level of understanding and knowledge of AI across the advertising and marketing industry in order to put the rest of the survey in context. Specifically the research probed:

- 1) Knowledge of AI: What is the current level of AI understanding in the advertising industry?
- 2) Collective Definition: AI is one of those acronyms that one reads and hears in the press frequently. Is supervised learning a known term? Can ad executives describe deep learning? How does one define AI/Artificial Intelligence today? Can the industry come to a standard definition?

### Objective 2: Specific applications of AI

The second area of inquiry was to probe for examples of current applications of AI, and to get a detailed sense of which tasks and roles AI could impact.

- 3) Benchmark Where We Are Today: AI is appearing in several parts of the consumer experience. What are some examples of AI today?
- 4) Jobs: What advertising jobs and/or tasks can AI assist or replace?

### Objective 3: Creativity and AI

The third area of inquiry tested the industry's views of how truly creative AI could be, particularly in context of the creation of advertising and innovative thinking. Specifically:

- 5) Creativity: Can AI be creative? Can AI enhance advertising creative? How will one see the creative landscape altered and expanded through AI?

6) Quality: Can AI-enabled machines create great marketing? Are ad practitioners familiar with AI examples?

#### Objective 4: Marketing Employment and AI

The fourth area of inquiry probes in detail the employment challenges related to AI in marketing.

7) Work and Organizational Structure: As AI develops, how will it impact the way an individual in the media and marketing industry works? Will AI change the structure of media companies, agencies, and marketing departments? Which jobs will be impacted the most?

8) Challenges: What are the biggest impediments to the successful growth of AI solutions in media and marketing?

9) Emotional state: What emotional reaction characterizes the respondents when they contemplate an AI-enabled future?

#### Objective 5: Ethical considerations

Ethical considerations are inevitable in any discussion about AI, and this area of inquiry probes what concerns are topmost with the respondents.

10) Ethics: Are there fundamental principles that marketers want to keep in mind with AI?

### Objective 6: Education and AI

Education and remaining knowledgeable in the field of AI will likely be a concern with many respondents. This area of inquiry probes topics of interest and available resources in AI education.

11) Resources: Where should people start with learning and utilizing AI in their work and home life?

12) Topics and areas of interest: What areas are of most interest to begin a deeper knowledge of AI?

### Objective 7: The Future of AI

Finally the last area of inquiry focused on the respondents' overall view of the future of AI and its impact on the industry.

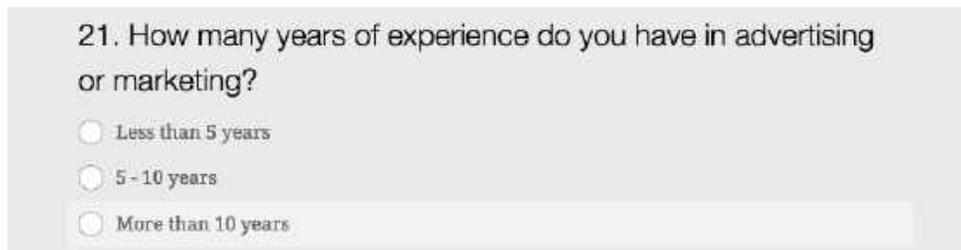
13) Future: Is there a more significant role for AI in media and marketing in the near future? What is next with AI?

Some survey participants agreed to follow-up interviews to expand their opinions on various areas of the survey. The follow-up interviews were conducted via one on one phone calls and the structure for these calls mirrored a review of the objectives of the thesis. Each phone interviews lasted one hour or more and were carried out in May, 2019. Participants for the follow-up interviews represented a cross section of survey participants.

### 1.3 Survey Question Types

The thesis research used a variety of techniques designed to elicit as much in-depth information as possible. Questions ranged in structure from quantitative demographic queries, multiple choice selections, rating scales, and longer response comment boxes.

*Demographic Questions:* To gather information about a respondent's background and to put their comments in context, for example:



21. How many years of experience do you have in advertising or marketing?

Less than 5 years

5 - 10 years

More than 10 years

*Multiple Choice Questions:* This question type allows the survey taker to select one or more options from a list of defined answers. Many of the survey questions followed this format and a sample follows.

\* 13. When considering information and education in Artificial Intelligence, which sources would you use? Please choose three sources, based on which sources you think are the most helpful.

- Marketing/advertising industry press
- Top university courses e.g. Stanford/MIT
- Google AI/Machine Learning sources
- Industry conference workshop/seminar
- Mainstream business press e.g. Forbes, Wall Street Journal
- LinkedIn
- Published books on the subject
- Free online courses
- Consulting with colleagues
- Testing AI applications myself
- Other (please specify)

*Rating Scales:* With rating scale questions, the survey taker selects a single rating along an equally-spaced continuum of possible choices, like the example below.

\* 8. One of the biggest areas of debate is exactly how creative Artificial Intelligence can be. In your opinion, how “creative” can Artificial Intelligence become?

Creativity cannot be replaced by a machine      AI is an assistant to creativity      AI can be as creative as a human

*Comment/Essay Box Question:* Open-ended survey questions require respondents to type their answer into a comment box, and do not provide specific pre-set answer options, for example:

6. Are there other tasks that come to mind that Artificial Intelligence could replace or assist that we didn't ask about?

#### *1.4 Detailed Overview of Fieldwork*

The study was a mix of quantitative and open-ended inquiry, totaling twenty-one questions.

The quantitative portion of the study took place in two waves:

**Wave 1.** The first survey used a list of respondents contacted via personal email. Of the 7000 people emailed, the open rate was 59%, with 3900 people viewing the email. Of this set of people, 212 respondents in total completed the survey for the US market, which is a response rate of 2%. The respondents were skewed to male and older. The average completion time was twelve minutes, with no drop off (100% completion rate).

**Wave 2.** The second survey was undertaken to enlarge the survey sample, but also to ensure that the overall survey reflected a full range of ages, experience

and genders. The second wave purchased respondents who were under 40 and who work in the advertising or marketing industry in the US. Because this portion of the survey was run through a research service, the open rates and response rates are not available. The total number of respondents in wave 2 was 308, and skewed female. The average completion time was seven minutes, and there was more drop-off during the survey with a completion rate of 75% and briefer answers.

Following on the Wave 1 portion of the study, a follow-up interview was requested with those respondents who volunteered to make themselves available for a qualitative in-depth interview. A handful of respondents, representative of different perspectives in the industry were selected and the interview methodology followed the same discussion guide as the main survey.

### *1.5 Detailed Overview of Respondents*

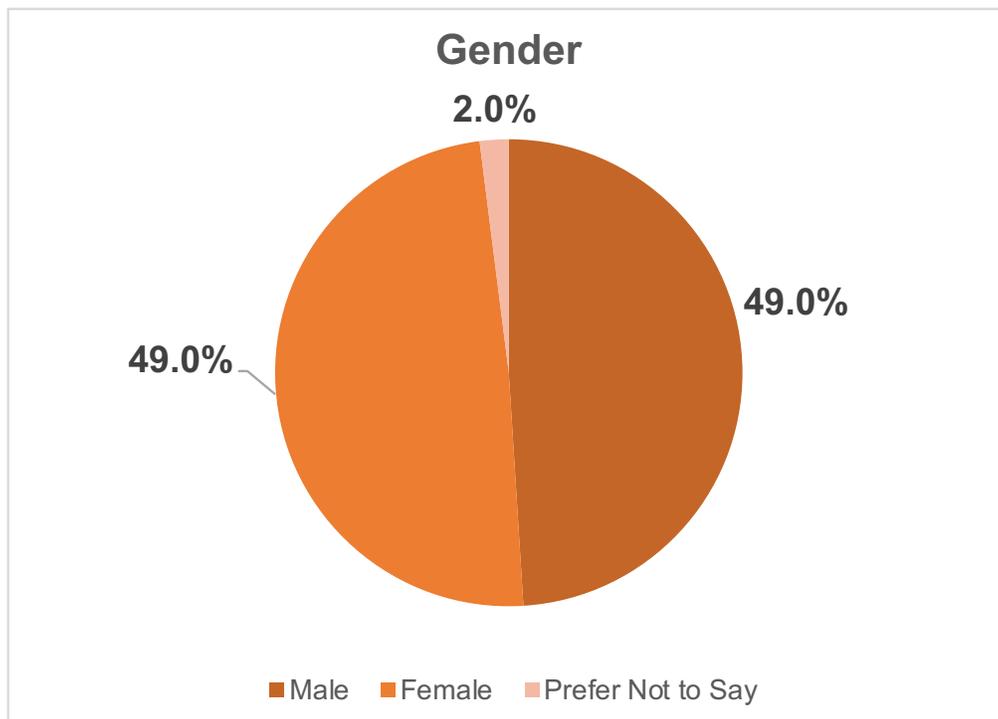
In total, the complete sample reflects a statistically significant and representative snapshot of the advertising and marketing industry made up of advertising agency employees, marketing professionals at Fortune 500 companies, and technology-focused media executives.

Wave 1 sourced the list of advertising professionals from a database of marketing executives owned by social media technology company Qnary. The Company has a

database of over 20,000 advertising and marketing executives in the US. Before fielding the full study, one ran a trial to test the methodology and to help catch any errors or clarify questions. The test and actual survey utilized online research tool company Survey Monkey for its graphical interface quizzes. The survey approach was to develop a format for repeatable studies on an annual basis.

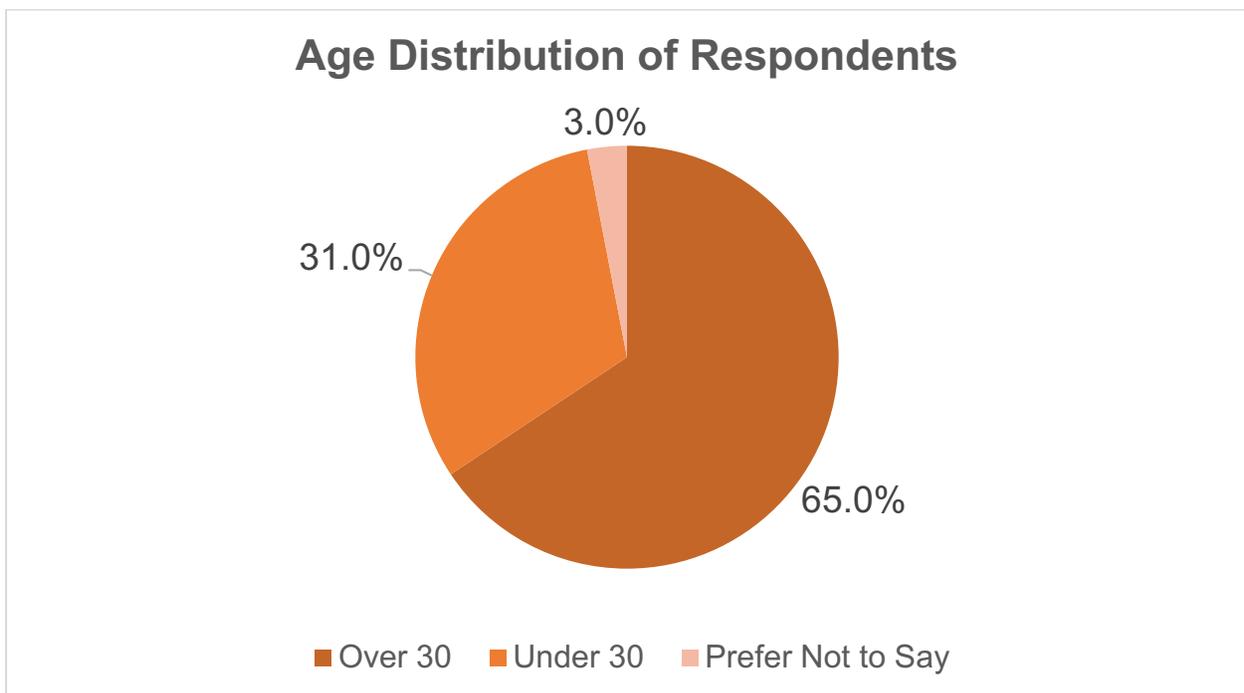
In terms of gender, the survey offered a balanced split between women and men respondents with 49% female, 49% male, and 2% preferring not to say (Chart 1.1). Women comprise the bulk of the US marketing industry's workforce. That skew is 67 percent female and 33 percent male, according to the ANA Overall Membership study (Duggan, 2018).

Chart 1.1: Thesis Research Respondent Gender Split



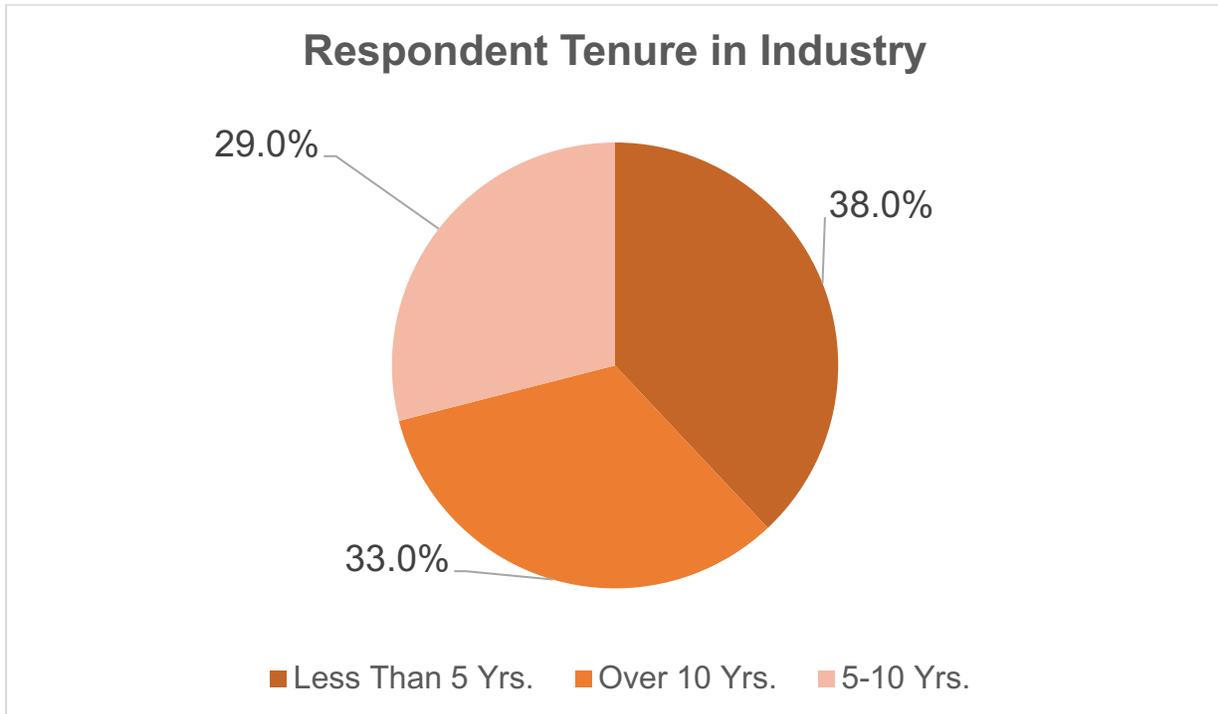
The age of respondents split 65% over 30 years old, 31% under 30 years old, 3% preferred not to say and 1% did not answer (Chart 1.2). The percentages are very close to the numbers highlighted by the Bureau of Labor Statistics, where the median age for professionals in advertising is 40.2 (Bureau of Labor Statistics, 2018).

Chart 1.2: Thesis Research Respondent Age Distribution



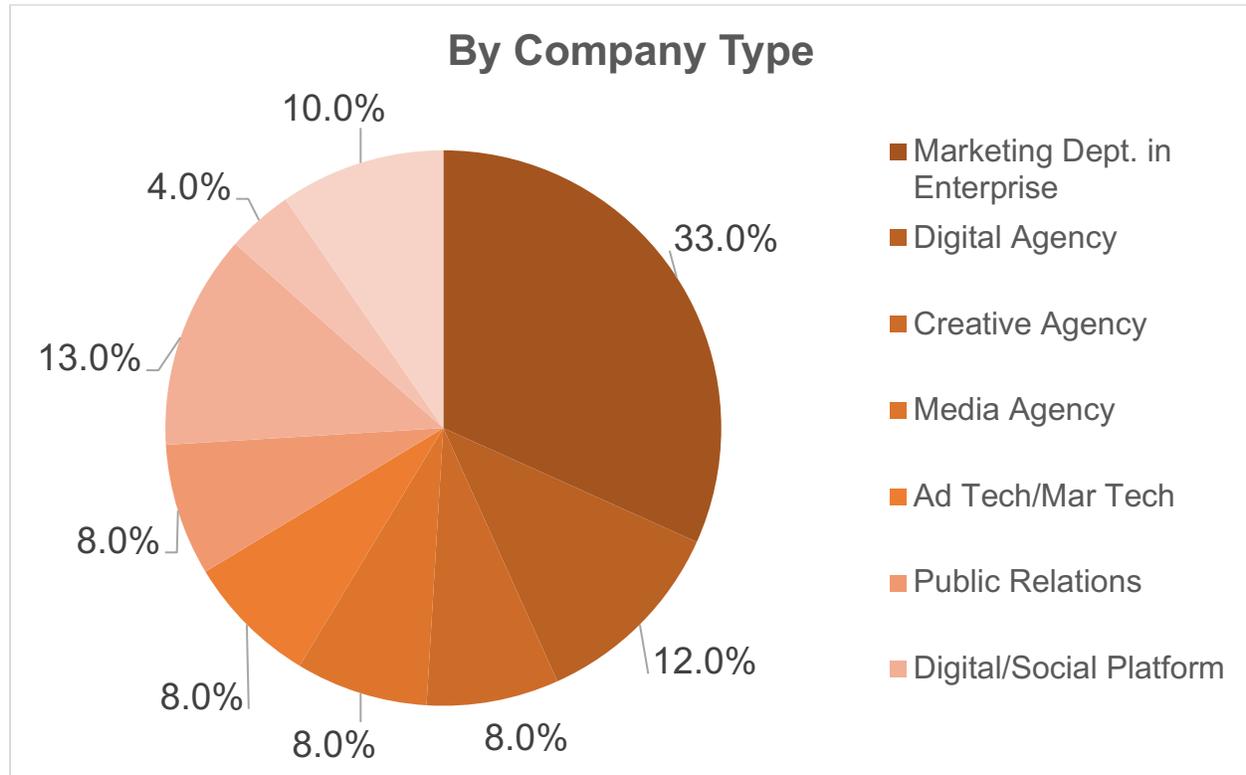
The respondent mix of tenure also provides balance in terms of age and seniority. The tenure in the industry split relatively into thirds with 33% of those surveyed having over ten years of experience in the industry, 29% having 5-10 years of experience and 38% having less than five years in the business (Chart 1.3).

Chart 1.3: Thesis Research Respondent Tenure in Industry



Respondents worked at the full range of types of companies in the industry with 33% coming from marketing departments of enterprises. The remainder of the participants came from creative agencies (12%), digital agencies (8%), media agencies (8%), AdTech/MarTech (6%), public relations (8%), digital/social platforms (13%), and media publishers (4%) (Chart 1.4).

Chart 1.4: Thesis Research Respondent Distribution by Type of Company



For the qualitative interviews, a selection of opinions was sought from various roles within marketing and advertising. For the research an artificial intelligence expert was interviewed, as well as a cyber security specialist, an intermediate level account manager at a digital agency, a senior marketer and a senior agency executive.

The follow-up participants were:

1. Jim Sterne: Internationally known speaker and consultant to Fortune 500 companies and Internet entrepreneurs, Jim has over twenty-five years in marketing - most of that on measuring the value of digital media for creating and strengthening customer relationships. Author of a dozen

books on advertising, marketing, customer service, email marketing and web analytics. Founder of the Marketing Analytics Summit (eMetrics Summit), the Marketing Evolution Experience, co-founder of the Digital Analytics Association.

2. Aimer Reker: Aimee Reker guides marketing investments, improves teams, and increases returns on media in market for top agencies, brands, and technology companies. Inspired by possibility, she is equally experienced in building media capabilities at both the start-up stage and at the global holding company level. She's built media teams from scratch at FRWD in Minneapolis, Circle.com (Euro RSCG 4D), and MRM Worldwide. Reker was the first global digital strategist for the Los Angeles-based Emerging Media Lab for IPG. She led the selection and post-acquisition integration of search agency Reprise Media into IPG. And she has created technical, data, and content teams at the global level as SVP, global director of search and social for McCann WorldGroup.
3. Chelsea Marti: Chelsea has a history of success as a Senior Marketing Technology Executive. She has proficiency in business development, global marketing and social media expertise. Chelsea is a proven successful internal and external client and stakeholder interface partner. Whether at the helm of strategic development, digital procurement, AI and marketing automation implementation and scaling, online media or vendor/agency/asset management Chelsea draws upon her diverse and rich history across a breadth of clients and challenges. She is an expert at

creating and managing stakeholder and client satisfaction, achieving and exceeding demanding goals and targets. Companies Chelsea has made a positive impact at include Cognizant, Sprinklr, Automatic Data Processing (ADP), Intuit, Inc., Maples Communication, and the U.S. Department of Energy.

4. Chris Kieff: Chris is a marketing and cyber security professional who helped to grow social media and marketing technology business Sprinklr from 12 people to over 1700 and a \$1.8BN valuation in 6 years.

The qualitative interviews are woven into the broader review of AI research papers, surveys, trade press articles, AI-infused marketing campaigns and marketing related commentary on AI issues such as training and ethics.

There is quite a bit of ongoing research into all areas of AI. This thesis looks at the canon of knowledge concerning AI-related computer science and engineering, business, social science, law, government, and economics. This thesis does not dwell deeply on the scientific details of AI, but it is vital to consider them when outlining how AI, as a holistic subject, is impacting the advertising industry and when comparing and contrasting with the quantitative research study.

To provide an accurate read on where we are today the thesis highlights many examples of current AI creative work such as projects like "Daddy's Car," a song in the style of the Beatles, that is reputed to be the first song written by AI (Goldhill, 2016).

Leading research companies, technology businesses, and consultancies published research studies on AI and its' impact on the enterprise in the last ten years. One compared and contrasted the survey results from this thesis with reports from organizations such as McKinsey and Gartner.

The daily trade press of the advertising, media, digital technology industries provided a rich vein of material to review when evaluating the industry perception of AI and the latest milestones.

This mixed methodology approach to the research provides the balance and depth needed when evaluating a topic that reviews industry perceptions. The depth of quantitative research counterbalances the analysis of the AI and marketing today. Qualitative research offers the ability to challenge and compare the quantitative study and to put the data into a broader context.

## **Chapter 2. Overview of the Thesis Survey Research Results**

### *2.1 Introduction*

The thesis fieldwork was undertaken with specific objectives and areas of inquiry, but essentially represents the most complete survey of the topic at the time of writing this thesis. In order to put the research results in context, a full overview of the current research and learning of AI and its impact on marketing and advertising is required.

### *2.2 Related Studies*

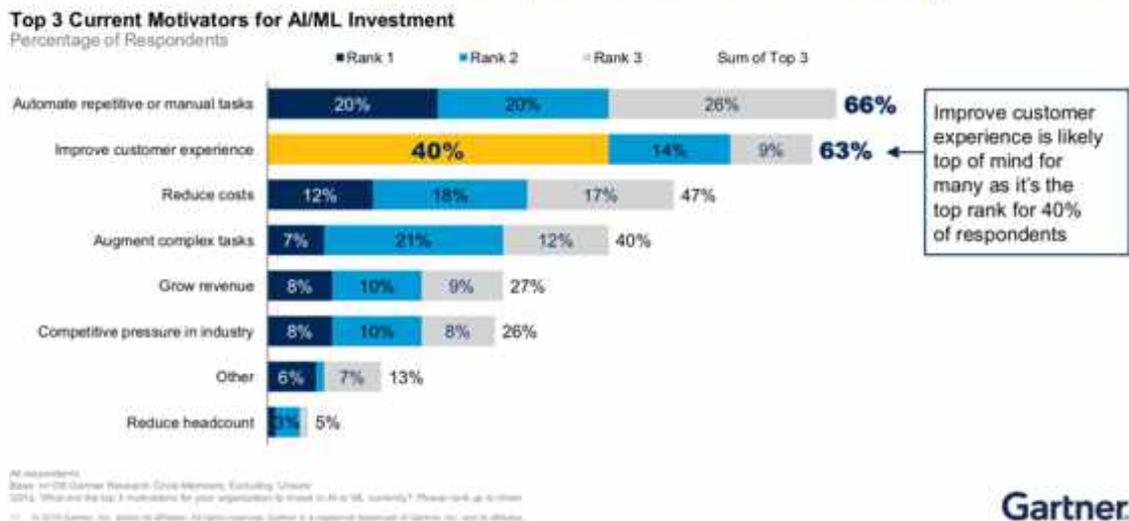
AI is hardly a topic that has been neglected when it comes to research, but much of it is broad or focused on specific economic impacts.

For example, Gartner's study of AI in 2018 found that only 14% of organizations have already deployed artificial intelligence implementation plans. 23% will use AI in the next

12 months. The Gartner study highlighted some of the same challenges found in the research completed for this thesis. 42% of the Gartner respondents had a low understanding of AI's benefits and uses. 56% mentioned the lack of the right skills for AI (Chart 2.1) (Gartner, 2018:11).

Chart 2.1: Motivators to Integrate AI for Automation and Improving Customer Experience (Gartner, 2018)

### Current: Top motivators to use AI or ML: Automate tasks and improve customer experience



Companies do not appear to be fully prepared for AI at this stage and are not rapidly developing ways to incorporate it into their businesses. Some 58% of organizations in international settings have not discussed AI's impact on the workforce with employees, according to a recent survey by the Workforce Institute (Groopman, 2018).

A study conducted by Globant surveyed 680 US senior-level decision-makers with responsibilities in marketing, technology, or operations. The study found that executives that are thinking about AI see the technology playing a supportive role. Using AI to surface consumer insights from massive data sets is the most immediate business benefit, according to nearly half (48%) of business leaders. Another AI benefit expected to make a quick business impact is automating routine responsibilities (32%) (Martin, 2018).”

Some of the broader studies parallel the worries on employment surfaced in the thesis research. McKinsey Global Institute completed a survey of 46 countries and 800 occupations and concluded that one-fifth of the global workforce will be affected. The study said one-third of the workforce in wealthier nations like Germany and the US might need to retrain for other jobs. In the US alone, McKinsey claims that 39 to 73 million jobs may be eliminated by 2030, but about 20 million of those displaced workers may be able to transfer to other industries easily (BBC, 2017). Pegasystems surveyed 5,000 consumers in the US, UK, France, Germany, and Japan and found 33% worry about machines taking their jobs, and 27% fear the, "rise of the robots and enslavement of humanity (Shultz, 2019).”

One recent study conducted by leading research group Forrester showed that most AI today fills a support function for marketing workers. Forrester refers to the major usage of AI as, or assistive AI, which performs acts like surfacing insights for marketers to consider during manual decision making, like channels to allocate spend against and

isolated campaign decisions, and also like e-mail timing or bid recommendations.

Forrester survey participants stated that AI helps them:

Gain more direct control over digital media buying — 50%

Improve the effectiveness of marketing campaigns — 49%

Improve our customer experience — 43%

Increase customer retention — 39%

Facilitate efficient and agile marketing operations — 37%

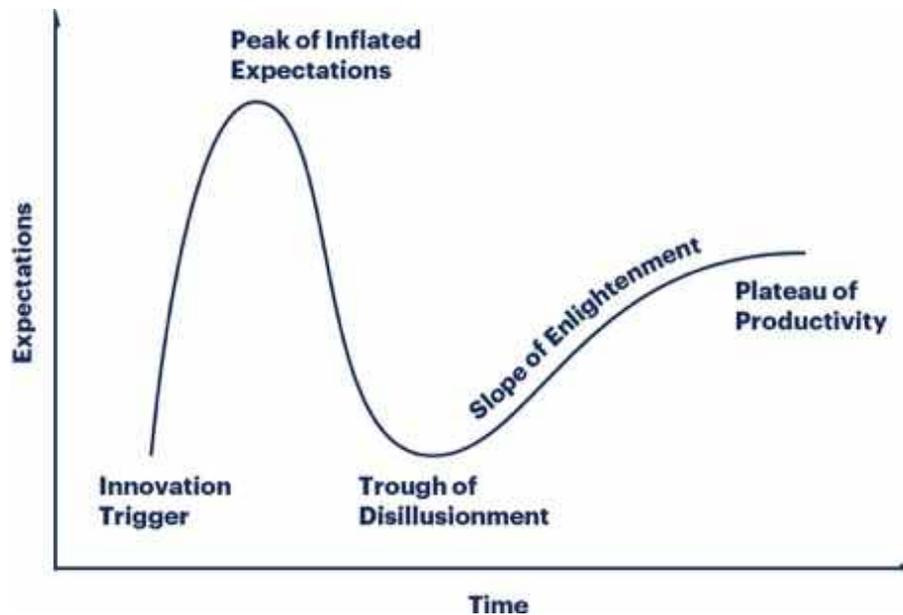
Achieve a better return on marketing spend — 36%

Increase customer acquisition — 33% (Forrester-Albert, 2019)

### *2.3 Related Models and Analysis*

AI in Advertising, both through industry sources and in the research that informed this thesis, demonstrates a significant gap between expectation and reality. To understand the dynamics of this behavior, one looked to other innovation/technology adoption models to see whether they fit. One can use a useful tool such as Gartner's Hype Cycle. Research and technology firm Gartner developed the Hype Cycle (Gartner, 2019) (Chart 2.2) to map where tech breakthroughs were in terms of their impact on adoption by enterprises. The idea of the Cycle is to help executives discern the hype of technology from what is commercially viable.

Chart 2.2: The Gartner Hype Cycle (Gartner, 2019)



Each Hype Cycle drills down into the five critical phases of a technology's life cycle.

*Innovation Trigger:* A potential technology breakthrough kicks things off.

Early proof-of-concept stories and media interest trigger significant publicity. Often no usable products exist, and commercial viability is unproven.

*Peak of Inflated Expectations:* Early publicity produces several success stories but are often accompanied by scores of failures. Some companies take action; many do not.

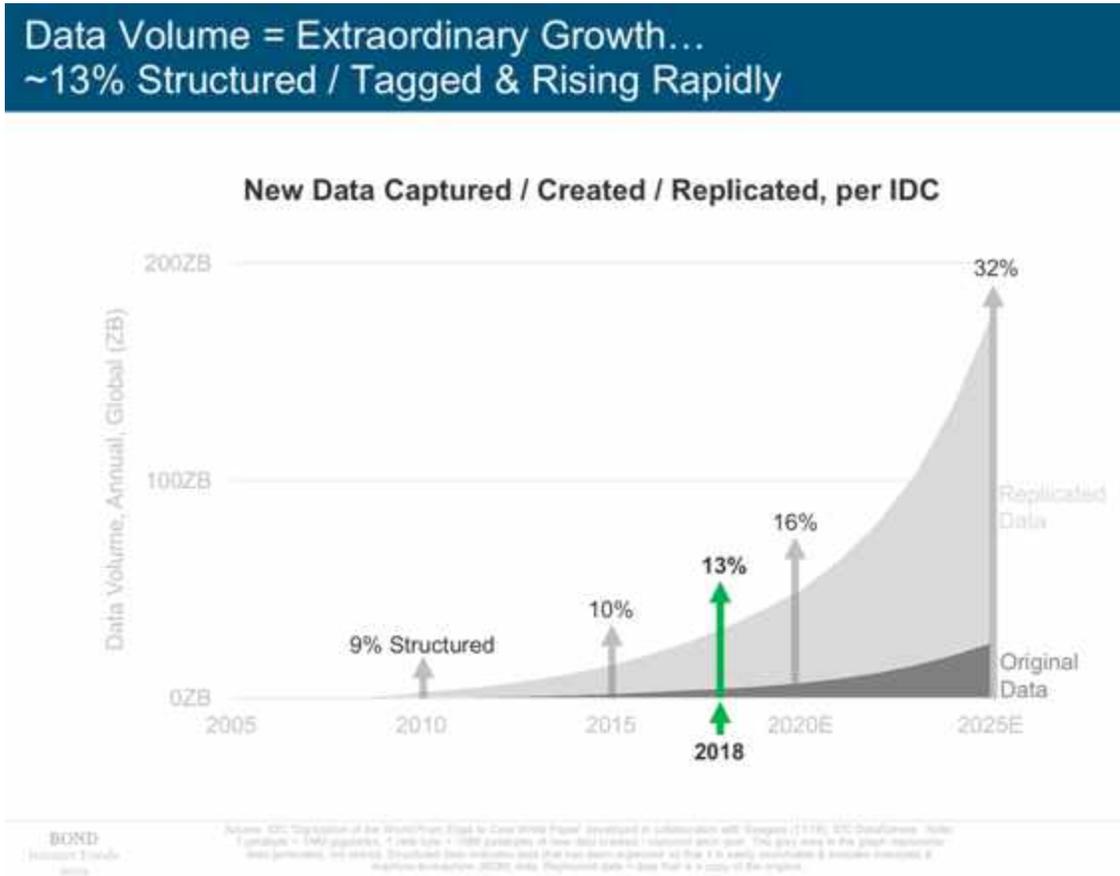
*Trough of Disillusionment:* Interest wanes as experiments and implementations fail to deliver. Producers of the technology shake out or fail. Investments continue only if the surviving providers improve their products to the satisfaction of early adopters.

*Slope of Enlightenment:* More instances of how the technology can benefit the enterprise start to crystallize and become more widely understood. Second- and third-generation products appear from technology providers — more enterprises fund pilots.

*Plateau of Productivity:* Mainstream adoption starts to take off. Criteria for assessing provider viability are more clearly defined. The technology's broad market applicability and relevance are paying off (Rouse, 2019).

While the Cycle does not directly correlate to how AI usage expands in advertising, it does provide a general framework to borrow from in part. Indeed, with the survey of AI, one sees a flurry of innovative activity, and perhaps the trigger is cloud-computing, which allows for much more data to be processed and managed. Digital Researcher and Forecaster Mary Meeker, in her famous 2019 study, highlighted the growth of data capture, which fuels AI. Data Volume increased approximately 13% in 2018, and the amount of structured and tagged data will continue to rise rapidly (Chart 2.3) (Meeker, 2019).

Chart 2.3: The Growth of Data Capture (Meeker, 2019)



The innovation trigger points to further growth, and AI appears to be racing to the next phase, which is the peak of inflated expectations. Tens of articles appear daily in mainstream and trade press about AI innovations such as a new AI-written advertisement or an AI system mastering a videogame. Indeed, AI demonstrates characteristics of being at the peak of inflated expectations.

Ad Practitioners do not appear to be disillusioned about AI. Leading thinkers in the space caution that some of the exciting things promised by more advanced forms of AI are still years away. There are simple AI elements that are on their second and third generations of development and could also lead one to argue that society has reached a stage of AI enlightenment.

The engines that recommend copy in our Google e-mails and our LinkedIn responses or the Amazon or Netflix recommendation engines are indeed entirely accepted today. One could even venture to say that things like Chatbots and recommendation engines are mainstream, which would place AI into the Plateau of Productivity.

While AI development and adoption display several of the attributes highlighted by Gartner's Hype Cycle, it does not cleanly fit into the model.

As one assesses the results of this research study, it appears that we are at a hybrid hype-cycle moment with a steady stream of innovation, inflated expectations, doubts or worries instead of disillusionment, areas of enlightenment and even early examples of mainstream adoption.

There are many reasons that AI defies a linear cycle progression. Firstly, AI as a theory is not new, and many of the core ideas that drive breakthroughs today date back to early models developed in the late '70s and early '80s. Some of the core ideas have been around for a long time and are now finally being scaled with improved computing power and data warehousing.

Secondly, AI is a generalized term encompassing activities like simple AI, machine learning, deep learning, neural networks, natural language processing, and general artificial intelligence. The field of AI is at the starting point of some of these more complex sub-groups listed above like general artificial intelligence and at the same time already at a much more advanced phase of the roll-out of simplified AI.

Lastly, AI seems to be an integral change that is supplementing, changing, everything in our world. One may not realize AI's impact on one's personal or business activities, even though it's there. Take, for example, the famous teenage pregnancy example involving the brand Target. Initially published in 2012 in the New York Times Magazine, with the title "How Companies Learn Your Secrets," the article by Charles Duhigg recounted how Andrew Pole, a statistician for the retail giant, was directed to analyze purchasing habits to determine if changes in consumer behaviors could be correlated statistically to indicate which consumers were pregnant. The reason? The stakes are enormous. As Duhigg wrote, "New parents' habits are more flexible than at any other time in their adult lives. If companies can identify pregnant shoppers, they can earn millions." As it turned out, Pole succeeded. Target started sending out mailers explicitly for pregnant women. The problem was that Target delivered one of their baby mailers to a teenage girl, and when her father opened the mail instead, he was furious, the father contacted Target to complain, although it turned out that his teenage daughter was indeed pregnant. Target's algorithms had uncovered the truth before Dad did (Ammerman, 2019:257-264).

## 2.4 Introduction to the Research Results

Colin Angle, Founder, Chairman, and CEO of iRobot, remarked, “It's going to be interesting to see how society deals with artificial intelligence, but it will definitely be cool (Angle, 2016).” Ad practitioners surveyed for this thesis share Angle’s wonderment for AI but have little knowledge, understanding, or experience with the topic. Survey respondents have only a superficial awareness of how AI could impact work, ethics, creative, and media planning, buying, and optimization. The survey also highlights that respondents view creativity, strategy, and leadership as human-led activities. Research participants are fearful about AI’s impact on employment, but show little commitment to learning and upskilling for the AI-era. Advertising professionals and marketers are generally aware of AI but not embracing and planning for an AI-based future.

## 2.5 Overview of Results by Question

Question: Level of Understanding of AI

The first question aimed to calibrate a self-assessed read on the level of understanding advertising executives have of AI.

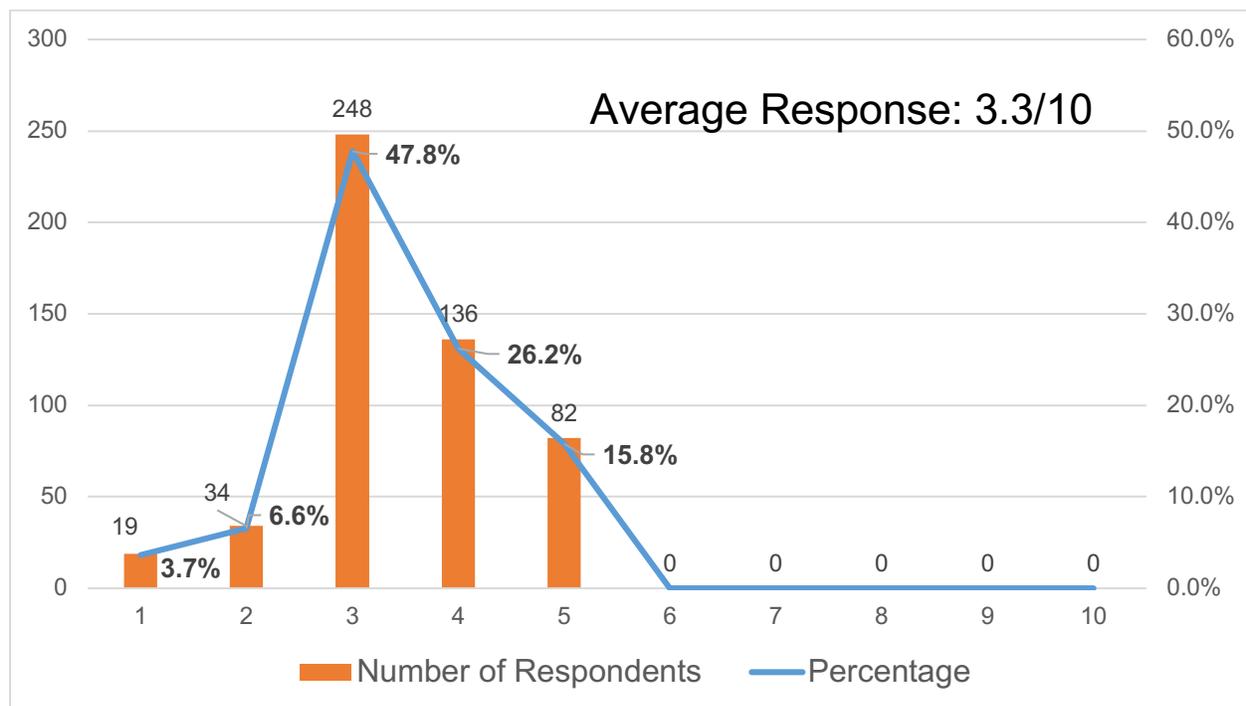
Question: We've all heard so much about Artificial Intelligence, Machine Learning, and Deep Learning. How would you characterize your understanding of the field of artificial intelligence? (Scale from 0 to 10, No Understanding to Excellent Understanding)

The majority of participants in the study highlighted their limited understanding of AI.

Out of the 440 respondents, the vast majority of the data fell in the lowest quartile, being

in the 3/3.5 range. This score is a clear indication that many respondents were not confident in their knowledge. There were some respondents, 18% of the sample, that characterized their knowledge level as "understand somewhat," which is a rating of 5. No respondents rated their knowledge above 5 (Chart 2.4).

Chart 2.4: Understanding of Artificial Intelligence, Machine Learning, Deep Learning; Distribution of Response Ratings from 0 (No Understanding) to 10 (Excellent Understanding)



The low level of understanding is, on the one hand, surprising with a topic that receives much media exposure. On the other hand, much of AI remains highly technical, and traditional marketing organizations are not employing the systems broadly for day to day activities.

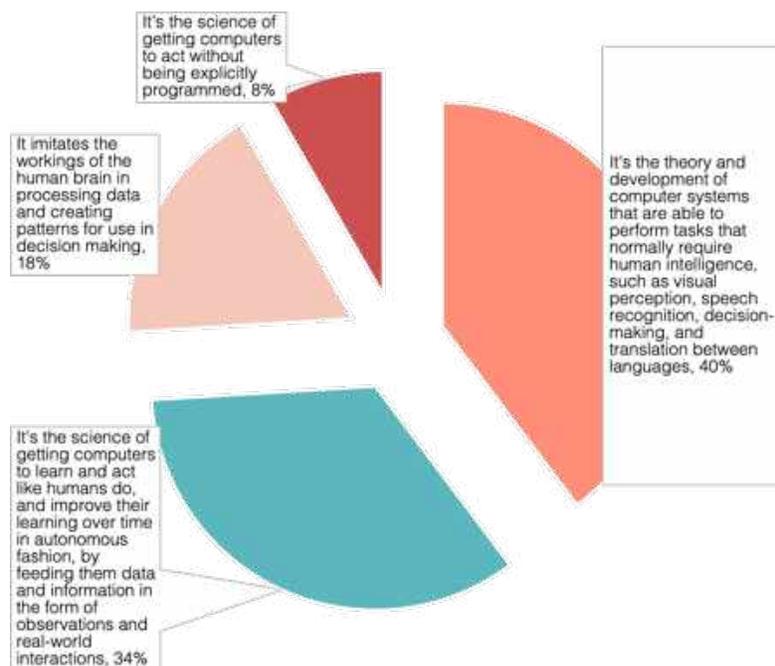
## Question: Definition of Artificial Intelligence

The second question probed for an understanding of the generalized field of AI.

Question: There is confusion about the differences between artificial intelligence, machine learning, and deep learning. Which definition below do you think best describes the term "Artificial Intelligence"? (Multiple Choice)

Survey participants could not come to a consensus on a definition for AI. Respondents did not choose a "majority" answer; therefore, there is no clear agreed-upon definition. The explanation that received the highest share of responses at 40% was a description focused on machine learning applied to tasks. The two definitions that were the longest and most descriptive ranked the highest (Chart 2.5).

Chart 2.5: Responses to Defining Artificial Intelligence



Perhaps the fact that respondents gravitated to the more extended responses reflects that the participants were looking for a catch-all answer. The lack of an agreed-upon definition highlights multiple factors. Firstly, the definition of AI and its related components remains unclear at best for the respondents. Secondly, no explicit definition agreement points to a lack of familiarity with the term AI by respondents and limited practical experience with the related sub-fields of AI like machine-learning.

### Question: Examples of AI in Advertising

This question probed respondents' awareness of great applications of AI in the marketing and advertising industry today. The question offers one to get a better understanding of respondents' familiarity with AI examples and assess how engaged they are with the general field.

Question: What examples of great applications of artificial intelligence in marketing and advertising come to mind? (Open ended).

Participants highlighted areas such as Chatbots and Programmatic media buying as categories where they saw compelling examples of AI. The largest group of respondents could not think of any good examples or did not believe there were any solutions of note. The non-response group included 117 mentions (Chart 2.65).

Chart 2.6: Responses to Examples of AI in Advertising in Percentages

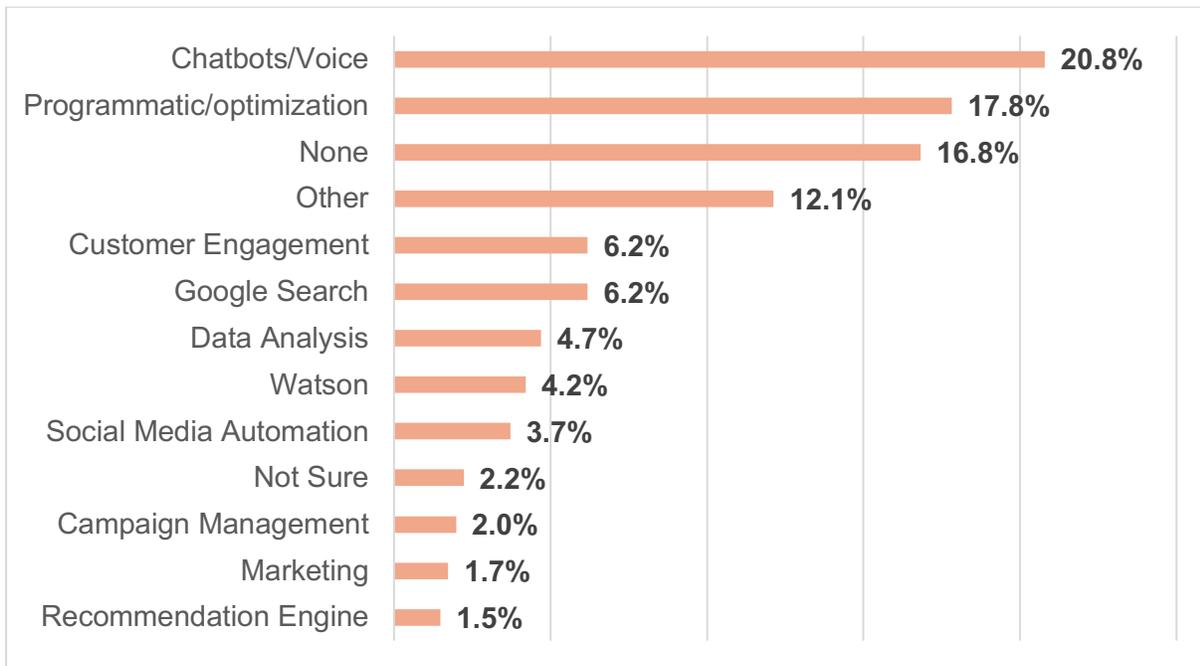
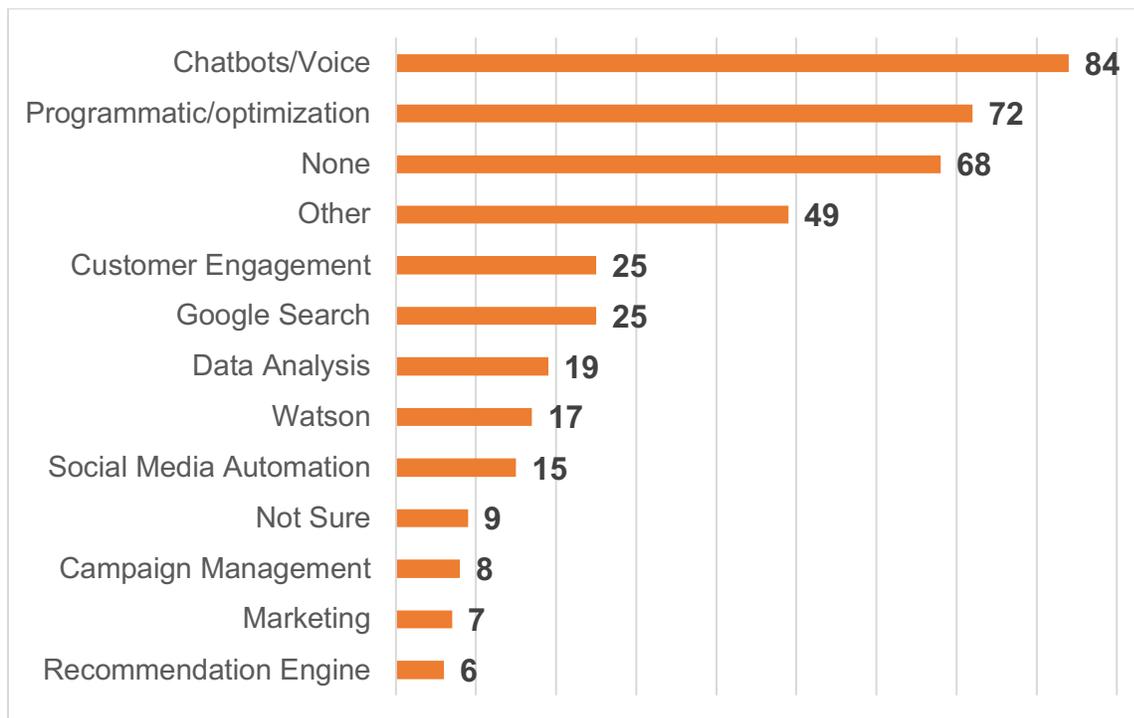


Chart 2.65: Responses to Examples of AI in Advertising by Number of Responses



Some of the open-ended responses provide more in-depth insight into the views of participants. IBM Watson received several call-outs. One participant wrote, "There are

lots of interesting examples using IBM Watson." Another highlighted, "The Fox Sports and Watson paring for the World Cup was terrific."

Other survey respondents mentioned examples that appeared to come from a mix of professional but arguably more personal experience. One commented, "Alexa being able to place orders for Domino's Pizza." A second survey taker stated, "The best/most immediate example I can think of is YouTube's recommendation algorithm. The "machine" recommends videos based on what it believes to increase watch time, which in turn increases advertisement revenue."

## Question: AI's Impact on Specific Advertising Tasks

Question: We'd like to hear your opinions about artificial intelligence and its impact on the core tasks of advertising and marketing. Listed below are just some of the tasks that Artificial Intelligence could impact. What impact do you think artificial intelligence could have?(Multiple Choice"

The charts (Chart 2.7) (Chart 2.75) show the impact of AI on critical advertising tasks, arranged from "AI can never replace or assist in this task" to "AI can replace this task." Except for the functions of site optimization and data analysis, the majority of respondents see AI's role as one of assistance. For data analysis and site optimization, respondents see AI as almost equally likely to replace for that task or assist with that task. The most mentioned tasks under the heading "AI can never replace or assist in this task" are brainstorming (141 mentions), video editing (95 mentions), consumer insight (94 mentions), and graphic design (93 mentions). Responses position AI as a helper. Strategic competencies poll as areas where humans will lead.

Chart 2.7: Responses to the Impact of AI on Critical Advertising Tasks in Percentages

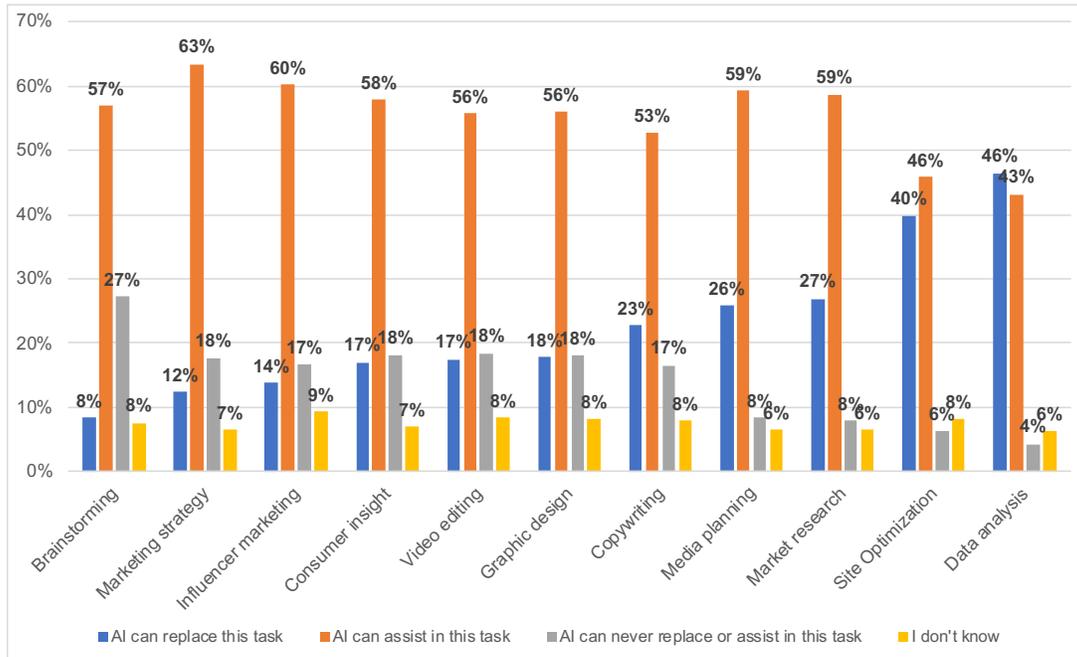
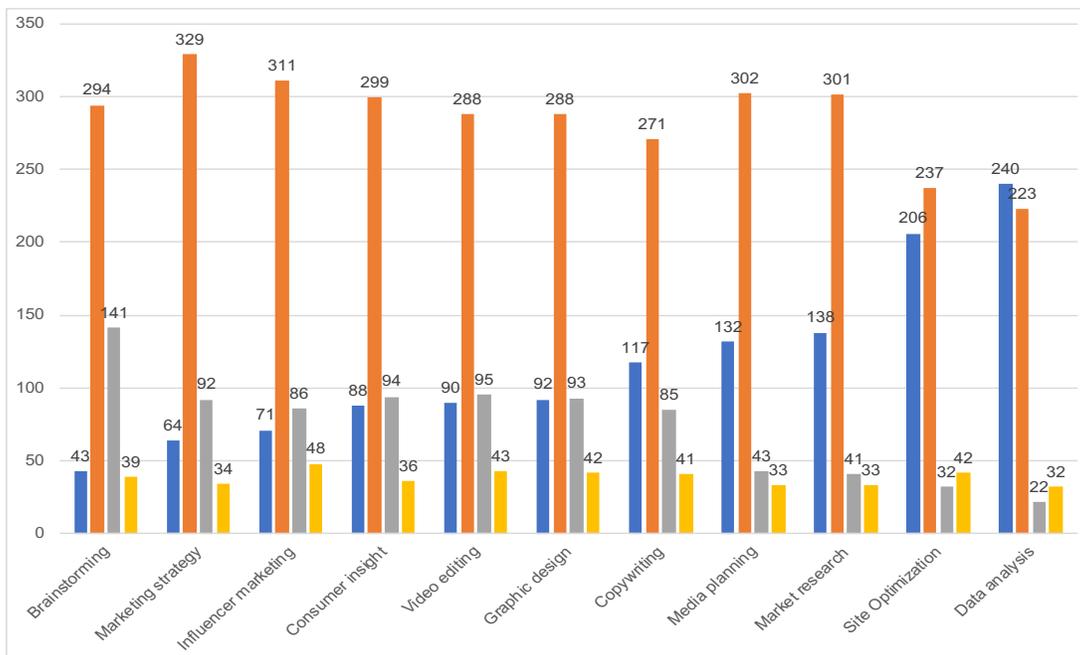


Chart 2.75: Responses to the Impact of AI on Critical Advertising Tasks by Number of Responses



## Question: AI's Impact on Specific Advertising Tasks – Other

Question: Are there other tasks that come to mind that Artificial Intelligence could replace or assist that we didn't ask about? (Open ended).

This open-ended question allowed participants to expand on the previous query and to think of other tasks that could be replaced or assisted by AI. Customer engagement captured the most mentions by far, followed by programmatic and ad operations (Chart 2.8) (Chart 2.85).

Chart 2.8: Open-Ended Responses to Possible AI Task Replacement in Percentages

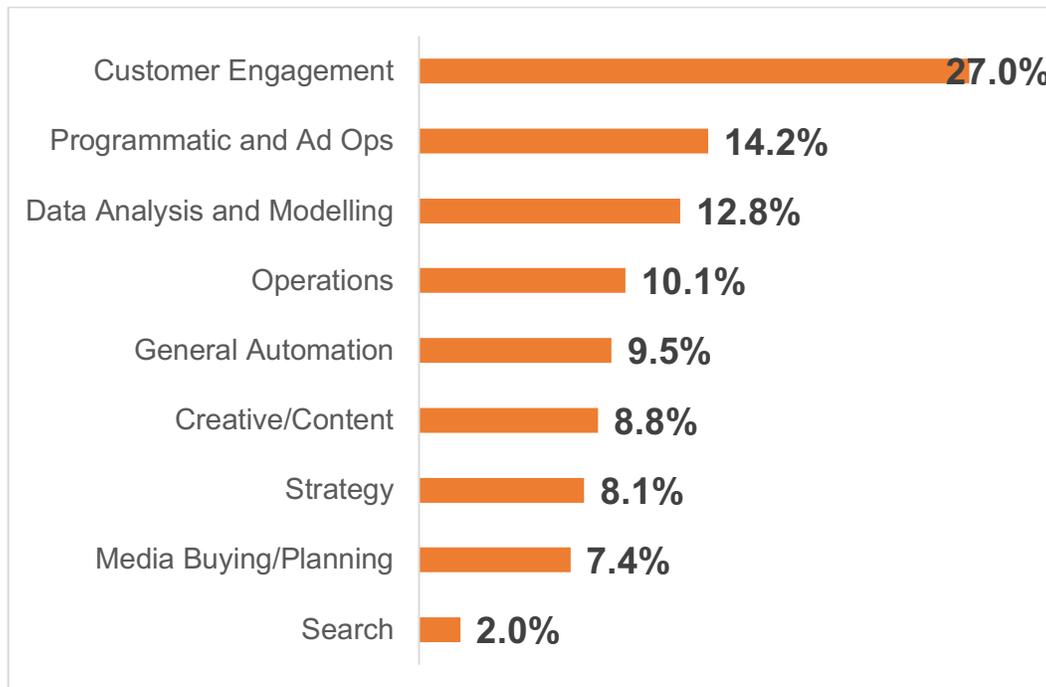
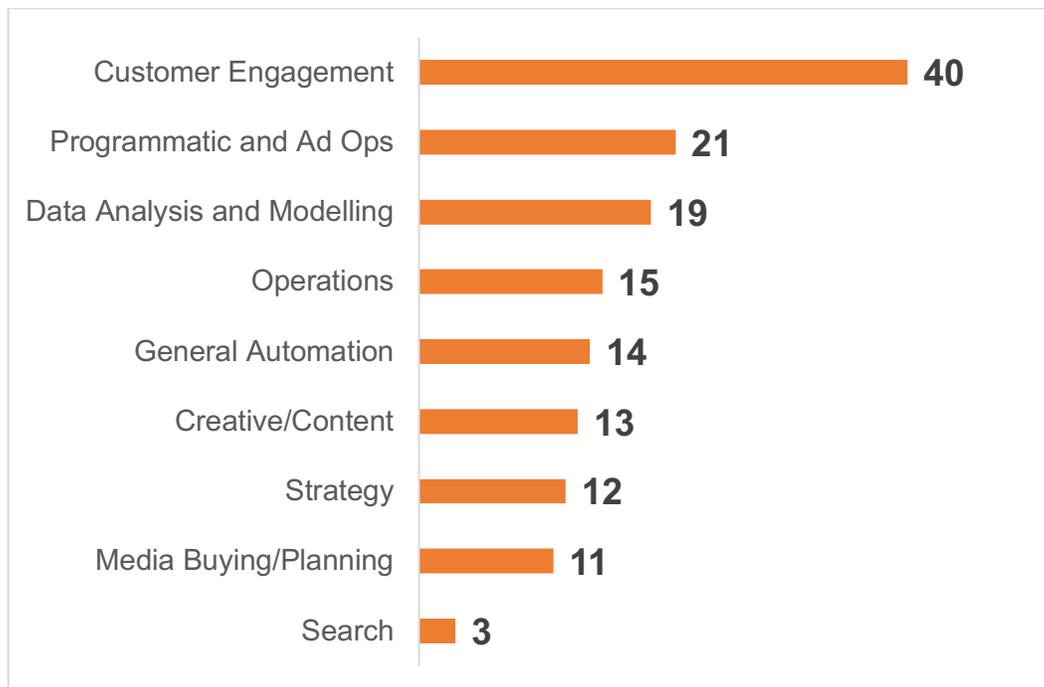


Chart 2.85: Open-Ended Responses to Possible AI Task Replacement by Number of Responses



Respondents offered detailed open-ended replies unearthing other clerical areas where AI support was welcome. One participant wrote AI can assist with, "Optimizing organic search and SEO, prioritizing A/B tests for conversion marketing, optimizing social media activation and in some ways finding real-time content to socialize in these channels quickly." A second participant shared that AI can impact, "anything that doesn't require creative execution and in-depth communication issues."

One participant created an example where he thought AI might play a role. He envisioned, "...a lifelike avatar that contains the body of human knowledge on a specific topic and can respond to queries based on this knowledge – educational and commercial applications."

Question: What Area of your Current Role could AI Assist?

Question: What area of your current role do you think Artificial Intelligence could assist? (Open ended).

The survey asked participants to think about their current role and where AI could lend an oar. A large number of respondents (83 specific mentions) were unable to be precise, answering in generalities like “Marketing”, or “Everything”. Some highlighted specific areas like research or graphic design. AI is a concept that marketers and advertisers know about generally, but the findings point to limited direct experience with the technology.

Some, however, were very specific and replies ranged from short term tactical applications of AI to larger what if/philosophical uses of the related technology (Chart 2.9) (Chart 2.95).

Chart 2.9: Responses to the Question of AI Assistance in Current Roles of Participants by Percentages

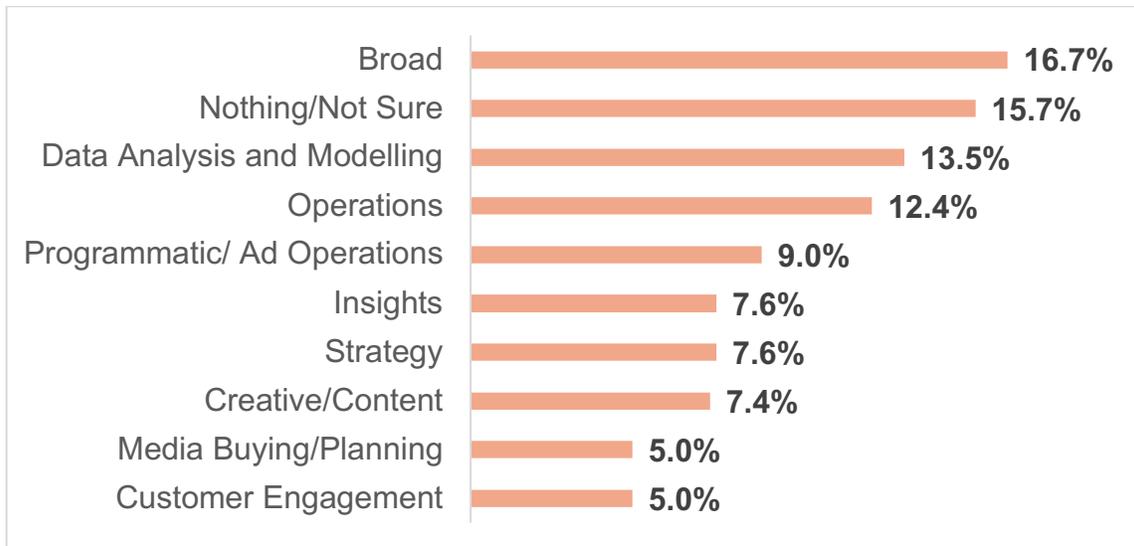
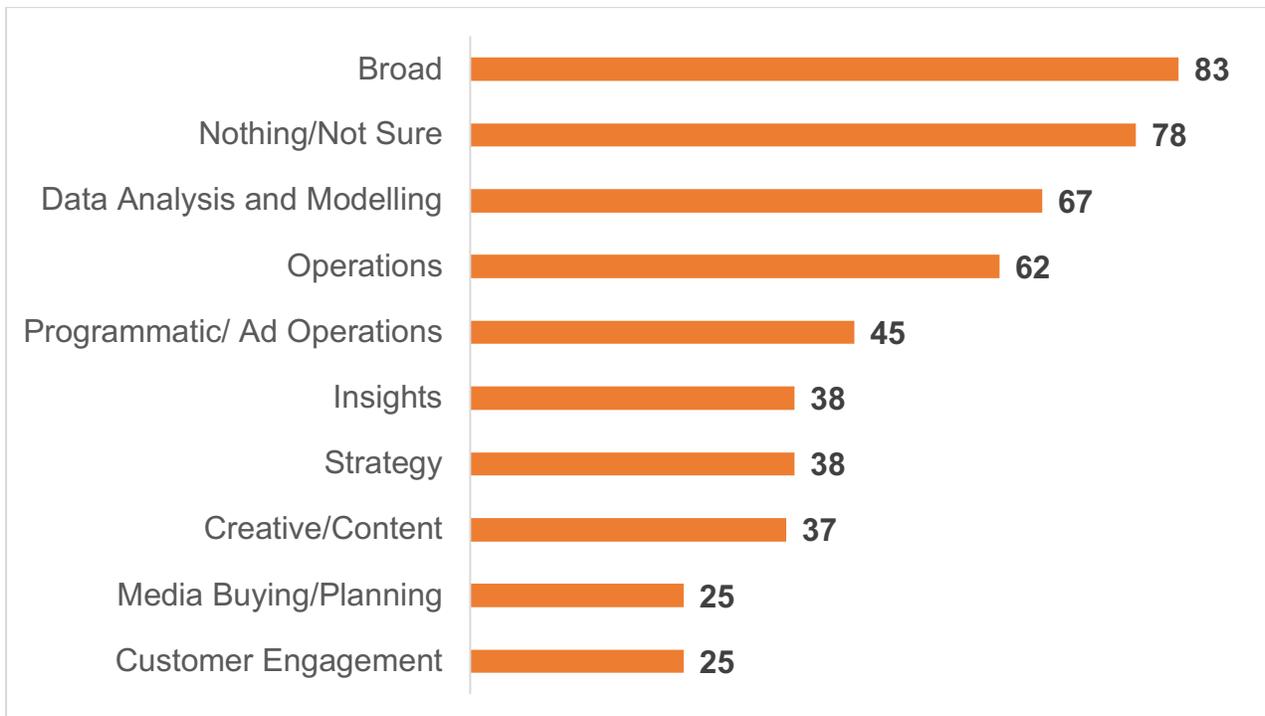


Chart 2.95: Responses to the Question of AI Assistance in Current Roles of Participants by Number of Responses



Specific comments included a call to help with research and public relations. One respondent exclaimed, "Research! My god if AI could tell me which conferences would be strategically advantageous for my clients based off of information provided by the company, connections made outside, and even reviews or conversations had regarding it that would be amazing. The same thing with the press- if I could know which journalists write about what topics and what buzzwords they use, I could better develop and pitch pieces for my clients."

Some pointed to the fact that assistance with data analysis would be handy. A survey participant opined, "I've always had the idea that artificial intelligence could aid in strategic marketing. Just by taking into account a lot more data than a human could to recommend strategies that are more likely to work and less speculative than if come up with by a human person."

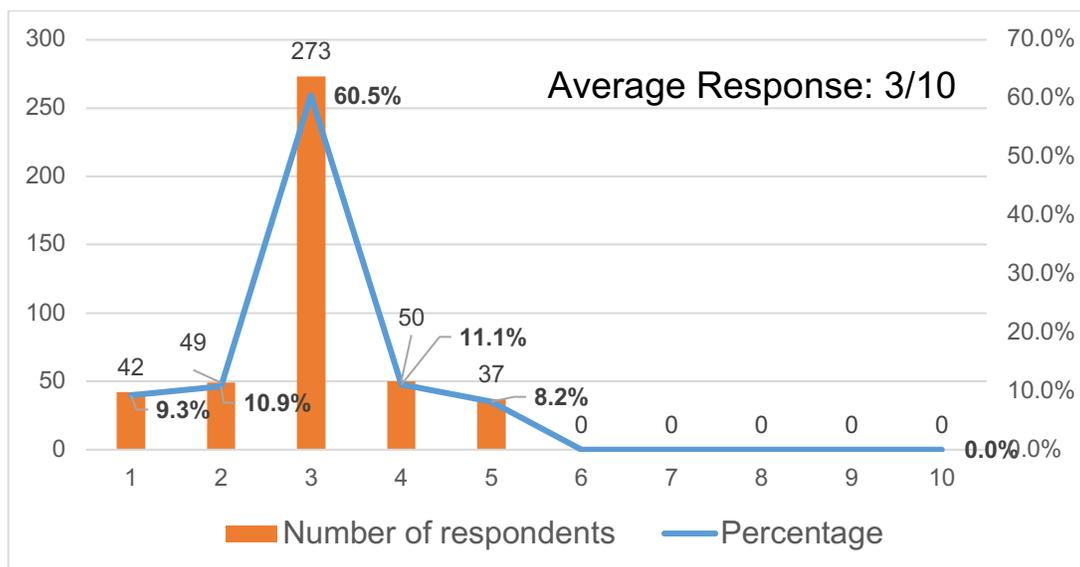
One respondent grappled with how far the assistance could go in helping with creative marketing endeavors. The respondent stated, "In graphic design, I think AI could assist with color palettes in terms of their marketing effects but not in terms of their visual appeal to the human psyche."

Question: Can AI Be Creative?

Question: One of the biggest areas of debate is exactly how creative Artificial Intelligence can be. In your opinion, how "creative" can Artificial Intelligence become?: (Scale from 0 to 10, Creativity Cannot be Replaced by a Machine to AI Can be as Creative as a Human)

The short answer to this question by respondents was a resounding no. Participants consistently answered negatively to this question, with an average of 3.0 on a scale of 1 to 10 in terms of how creative AI can become. There were very few respondents who rated artificial intelligence over 3 (19.3%) and none at all over 6. Participants that rated it 4 – 5 (low to medium in terms of creativity) also assessed their understanding of AI higher on average than the rest of the sample, with a rating of 4/10 vs. 3.3/10. (Chart 2.10).

Chart 2.10: Responses Concerning AI Creativity in Percentages and Number of Responses



Respondents do not see AI as something that can create something original, but instead, in connection with other responses, AI supports and makes things easier. Participants with more self-elected understanding provided higher scores which may allude to their knowledge of creative examples where AI already plays an active role.

Question: What jobs in your current company will AI replace?

Question: We'd like you to think about the potential impact of Artificial Intelligence on the jobs in your current company. What are the jobs that will be replaced? (Open-ended)

Based on total mentions, the top jobs in the respondents' current company that will be replaced by AI include data analysis, customer engagement, digital optimization, administration, researcher, and media (Chart 2.11) (Chart 2.115).

Chart 2.11: Mentions of Jobs that will be Replaced by AI by Percentages

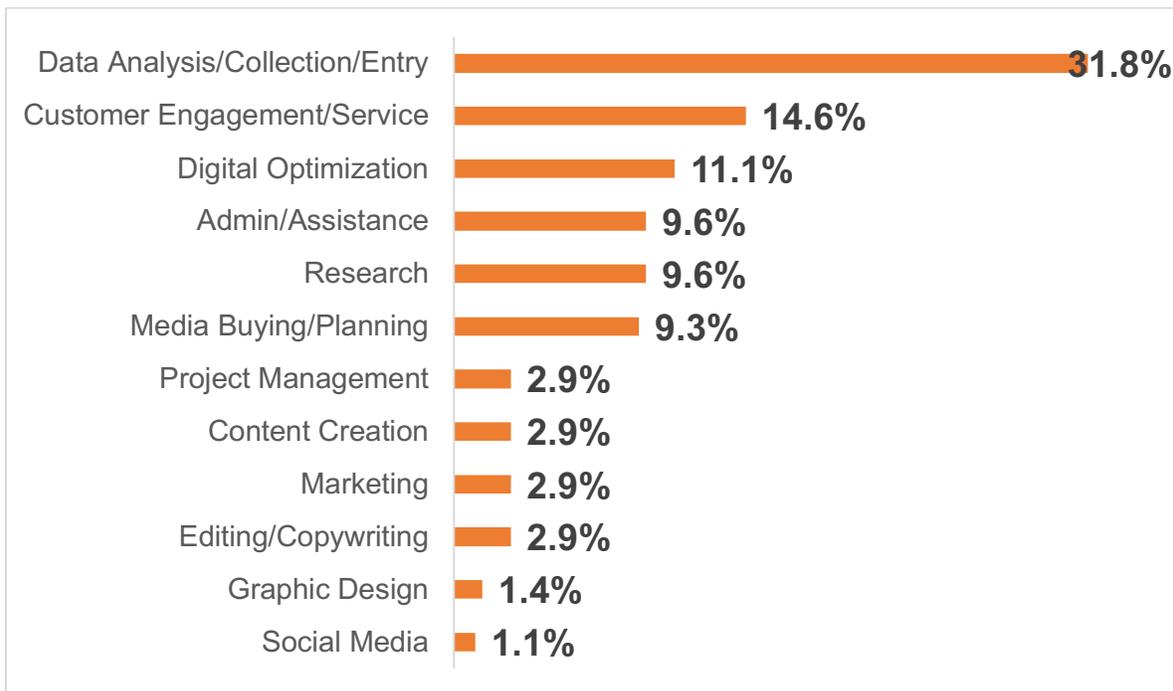
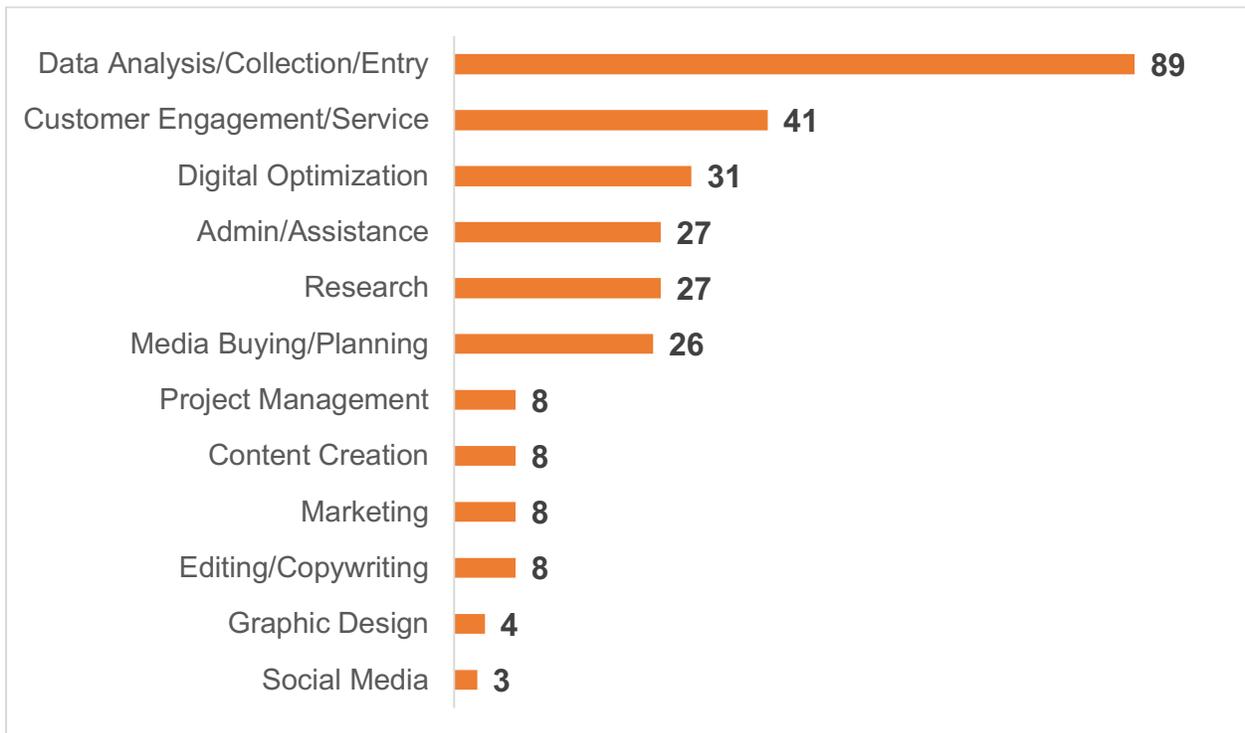


Chart 2.115: Mentions of Jobs that will be Replaced by AI by Number of Responses



"Higher value" roles requiring strategic thinking were further down the list. Respondents described replaceable functions were "less strategic" or "down the line."

## Question: What jobs can AI never replace?

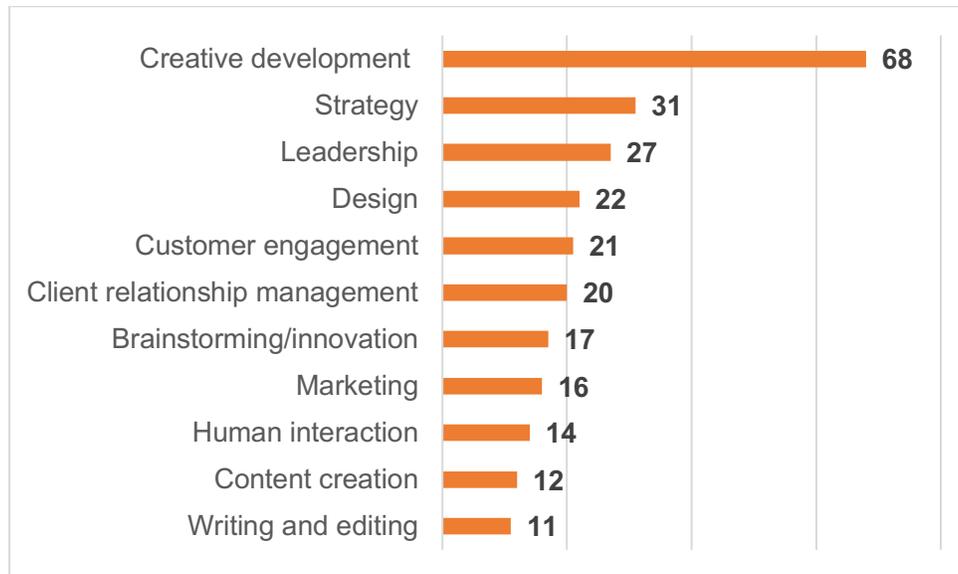
Question: We'd like you to think about the potential impact of Artificial Intelligence on the jobs in your current company. What are the jobs that can never be replaced by Artificial Intelligence?(Open-ended)

When asked the opposite way, the results were consistent. Roles that received the highest number of mentions for "cannot be replaced by AI" were primarily creative, strategic or leadership. A few respondents went so far as to be specific writing, "managing face to face" or "writing a brief vs. editing copy." A full 16% of respondents could not answer this question precisely, either responding "none" or "I don't know/unsure" (Chart 2.12) (Chart 2.125).

Chart 2.12: Mentions of Jobs That Can Never be Replaced by AI by Percentage



Chart 2.125: Mentions of Jobs That Can Never be Replaced by AI by Number of Responses



The results for this question support a core trend in the research, which is the belief that strategic disciplines remain outside of the realm of AI.

A second trend worth noting is the lack of confidence several respondents demonstrated by answering "none" or "I don't know/unsure." This reply points to a lack of understanding of AI today or interest in how AI will develop.

Question: Which aspects of AI present barriers to adoption?

Question: Which aspects of Artificial Intelligence in marketing and advertising do you think present challenges and barriers to adoption? Click all that you believe apply: (Multiple choice)

The barriers to adopting A.I. in the industry include fear as the top factor (total mentions of 211 or 10.1%), followed by missing or poor quality data (209 or 10%), budgetary constraints (183 or 8.7%), unrealistic expectations (182 or 8.7%), and training (163 or 7.8%). The two barriers that received the least mentions were too risky (105 or 5%) and not enough gains in efficiency (89 or 4.3%) (Chart 2.13) (Chart 2.135).

Chart 2.13: Mentioned Barriers to AI Adoption by Percentages

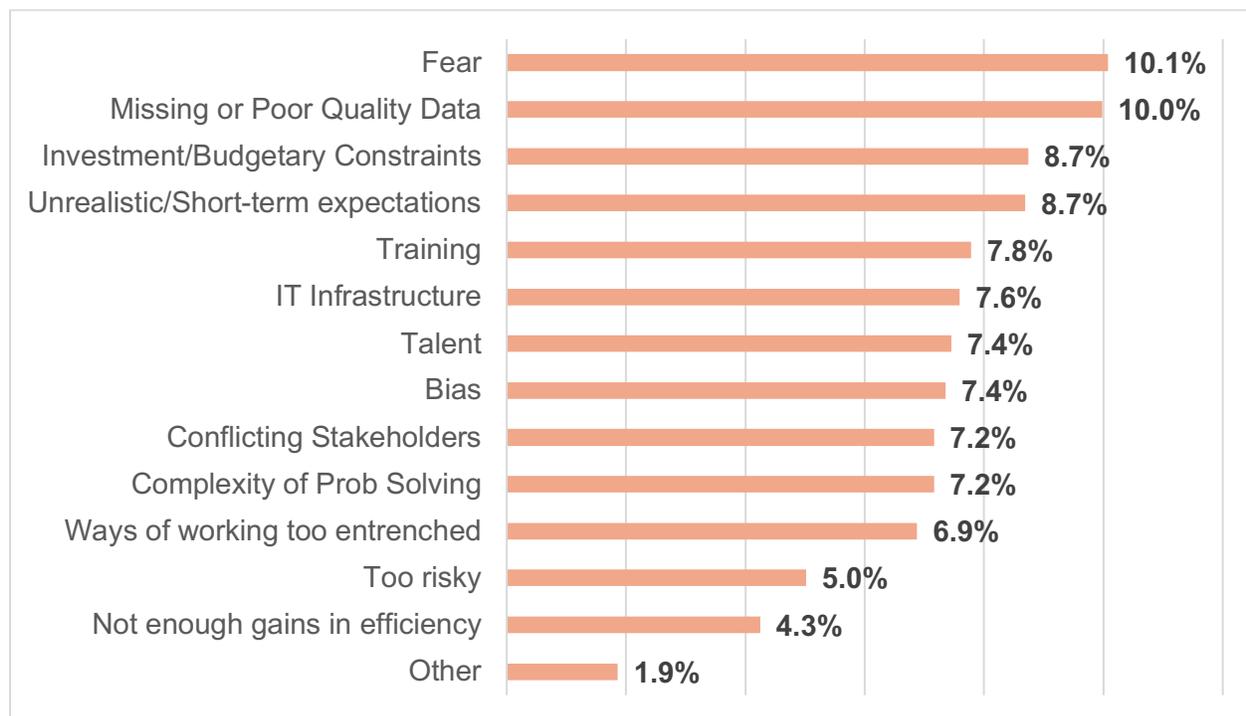


Chart 2.135: Mentioned Barriers to AI Adoption by Number of Responses



The top barriers are a mix of emotional reactions such as fear, structural issues (data, budget), and cultural factors (expectations, bias, company cultural resistance). One participant highlighted quality as a barrier at this stage. The respondent stated, "A machine might be able to source data, but at this point, we're not at a spot where the ability to focus/filter/create the very best product from this information can be designated to machines." Lastly, one reply mentioned misalignment around the leadership of the AI effort. He explained that there is "Confusion around who owns AI adoption within the company."

What is absent from the responses is a sense that AI will usher in revolutionary change requiring urgent measures. Fear appears at the top of the list of barriers, but it is not

leading to accelerated action. None of the survey participants indicated ongoing planning or restructuring happening in their businesses regarding AI as one sees in large tech companies like Amazon.

Question: What aspects of artificial intelligence do you need to know more about in your role?

Question: What aspects of Artificial Intelligence do you feel you need to know more about in your current role? (Check all that apply.)

As the advertising industry begins to invest in data services, it is perhaps not a surprise to see data organizing and structure topping this list. Tactical themes such as data organization and structure rather than AI fundamentals receive the most mentions (190 mentions or 9.9%). More immediate applications of AI like predictive messaging (189 mentions or 9.9%) , programmatic advertising (178 mentions or 9.3%), and AI-assisted search (169 mentions or 8.8%) also appear on the list. More experiential aspects of AI such as voice recognition, facial recognition, and robotics, receive the least mentions (ranging from 115 to 94 mentions, or 4.9% to 6%) (Chart 2.14) (Chart 2.145).

Chart 2.14: Respondents Possible Use of AI in their Current Role in Percentages

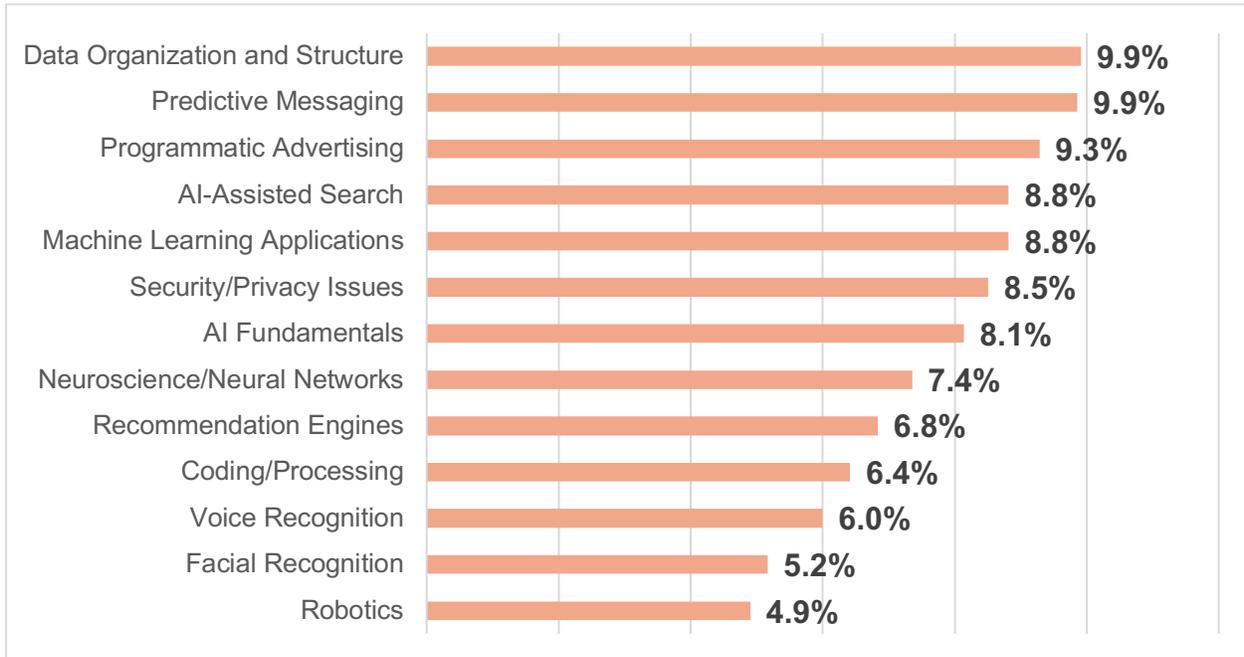
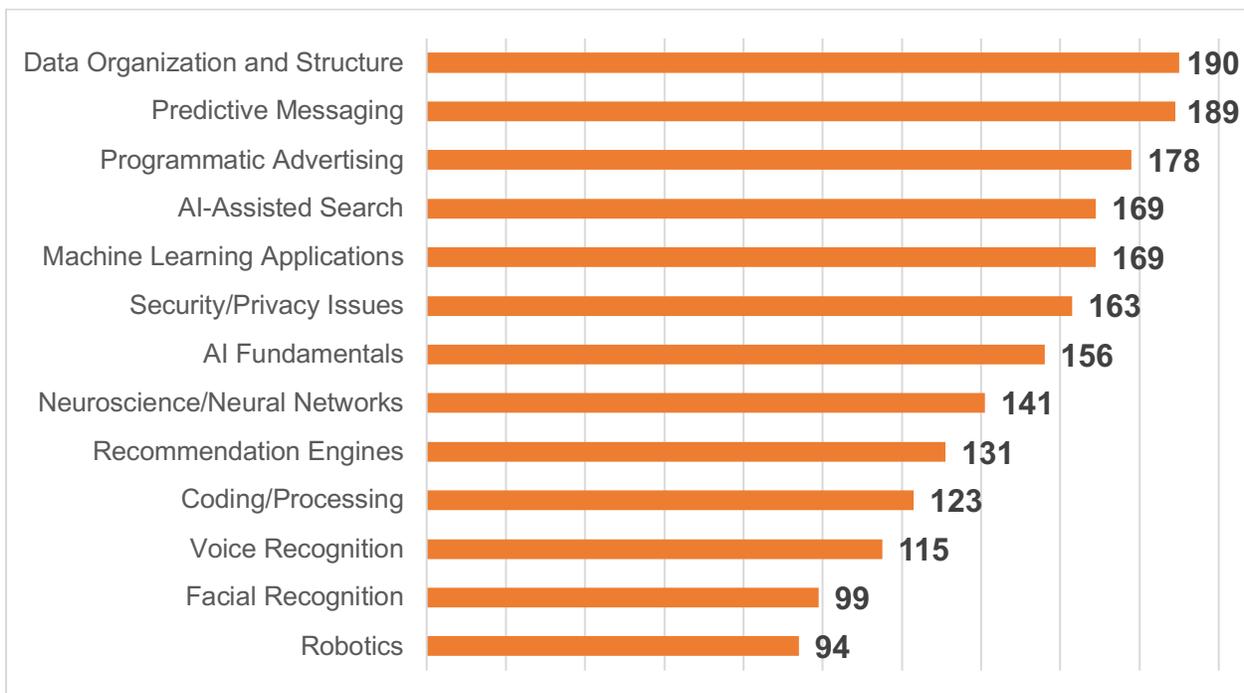


Chart 2.145: Respondents Possible Use of AI in their Current Role by Number of Responses



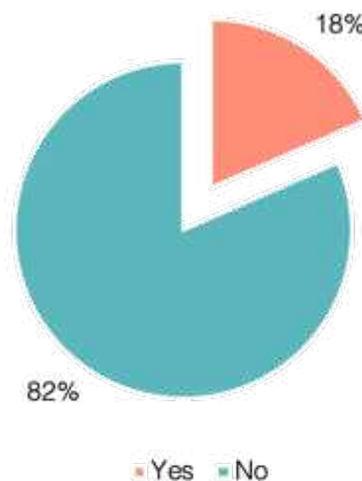
Respondents also added ethical concerns such as, "moral elements of hard coding current human bias into our AI. AI trained by imperfect humans leads to imperfect intelligence." Other participants asked company organization and culture questions such as, "How would AI affect my workplace as a whole?" Some agency respondents inferred that client knowledge of AI was lacking. One stated, "There is a gap between client knowledge and agency knowledge. The space has been moving quickly. Most clients don't know much beyond the trade articles that only scratch the surface."

Question: Does your company offer training in AI?

Question: Does your company offer training or education in Artificial Intelligence? (Multiple choice)

AI training is missing in the advertising and marketing industry. Overall, only 18% of respondents say that their companies offer training in AI. The vast majority of the industry, 82%, say their companies do not. In the second survey with a younger sample, the rate of companies offering AI training was higher – 24% vs. 12% for the first survey but still highlighted the lack of education in the space today (Chart 2.15).

Chart 2.15: Companies Offering Education in AI as Observed by Respondents



The missing training element highlights the limited sophistication of the advertising industry in terms of AI. From previous questions, it is clear that there is awareness of

the field of AI, not a tremendous understanding of AI and limited education on theoretical and tactical elements of AI.

Question: When considering education in AI, which sources would you use?

Question: When considering information and education in Artificial Intelligence, which sources would you use? Please choose three sources, based on which sources you think are the most helpful. (limited multiple choice)

Google appears to be the authority of the advertising industry on the topic of AI. This survey response could be a reference to some of the well-publicized achievements by Google in the AI space such as Google Deepmind's AlphaGo victory in the board game Go and subsequent equally victorious versions such as AlphaGo Zero and AlphaZero (BBC, 2016). The education sources that receive the most mentions imply a level of trust. Google gets the most mentions by far (16.1%) , followed by marketing/advertising (13.4%) industry press and top university courses (11.7%) (Chart 2.16) (Chart 2.165).

Chart 2.16: Respondent Choice of Information and Education About AI by Percentage

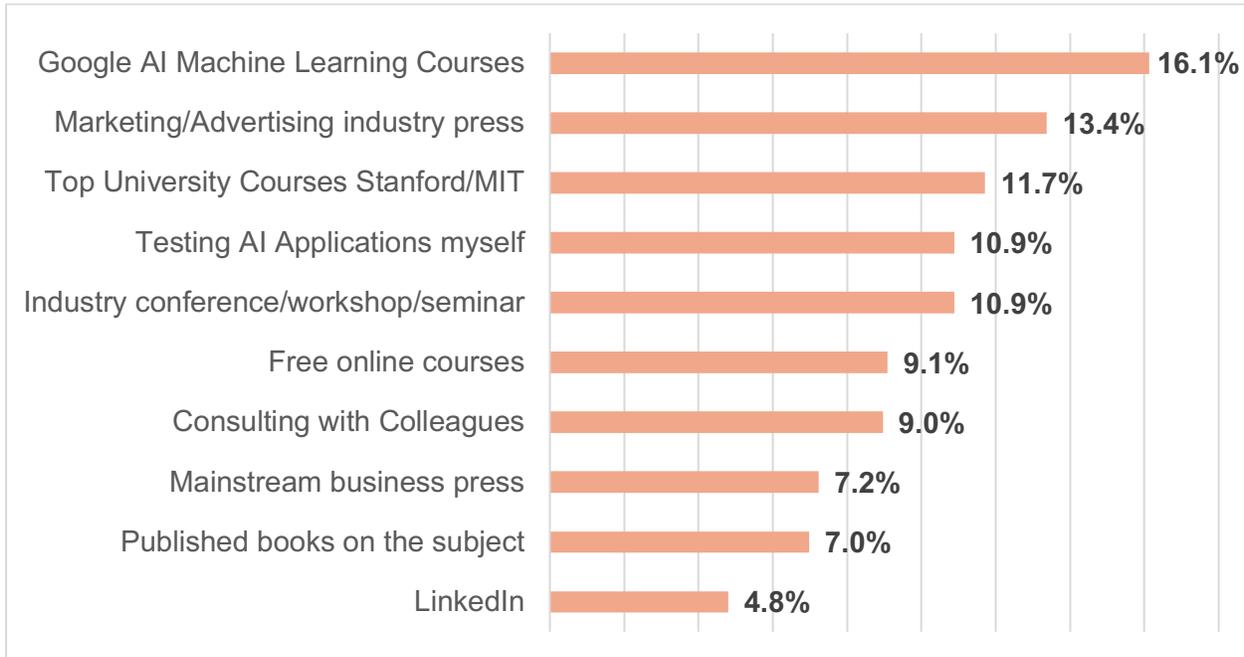
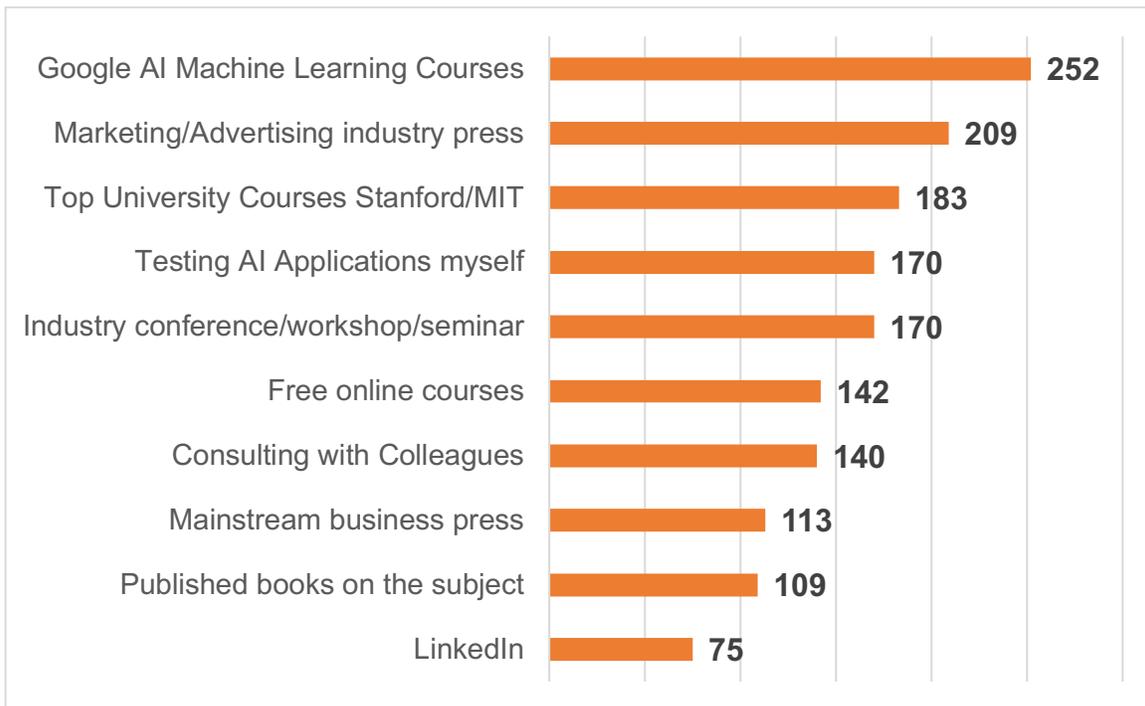


Chart 2.165: Respondent Choice of Information and Education About AI by Number of Responses



Respondents also added sources as "other" such as, "IBM Watson," "Harvard Business Review" and "talking with CEOs or CTOs of top new companies in the space on a 1 to 1 basis." IBM Watson is the successful AI division of IBM famous in the machine-learning world for winning the knowledge-based game show Jeopardy. The brand IBM Watson is the industry generic used as someone might use Coke to mean soda (Hardawar, 2015).

Question: Thinking about AI and the advertising/marketing industry, which ethical challenges concern you?

Question: The explosive growth of Artificial Intelligence is going to bring about many ethical challenges. Thinking about the advertising/marketing industry, which ethical challenges concern you? (Click all that apply.)

Respondents approached this question with a mix of practical and personal considerations. Privacy is a priority for several marketers, especially with news of big company data breaches such as CapitalOne. Advertising professionals ponder Facebook's struggle with balancing the needs for platform user privacy and the demands of advertisers for audience targeting data (Colby, 2019) (Lecher, 2019). Many other vital issues received mention, such as fraud. One sees fraud as an often-cited worry with new technologies. The fear of the impact of AI on jobs (significant job losses 207 or 13.0%) garnered attention. Also noted were topics such as racial bias (131 or 8.2%) and gender bias (128 or 8.0%) (Chart 2.17) (Chart 2.175).

Chart 2.17: Ethical Challenges to AI Integration as Mentioned by Respondents by Percentage

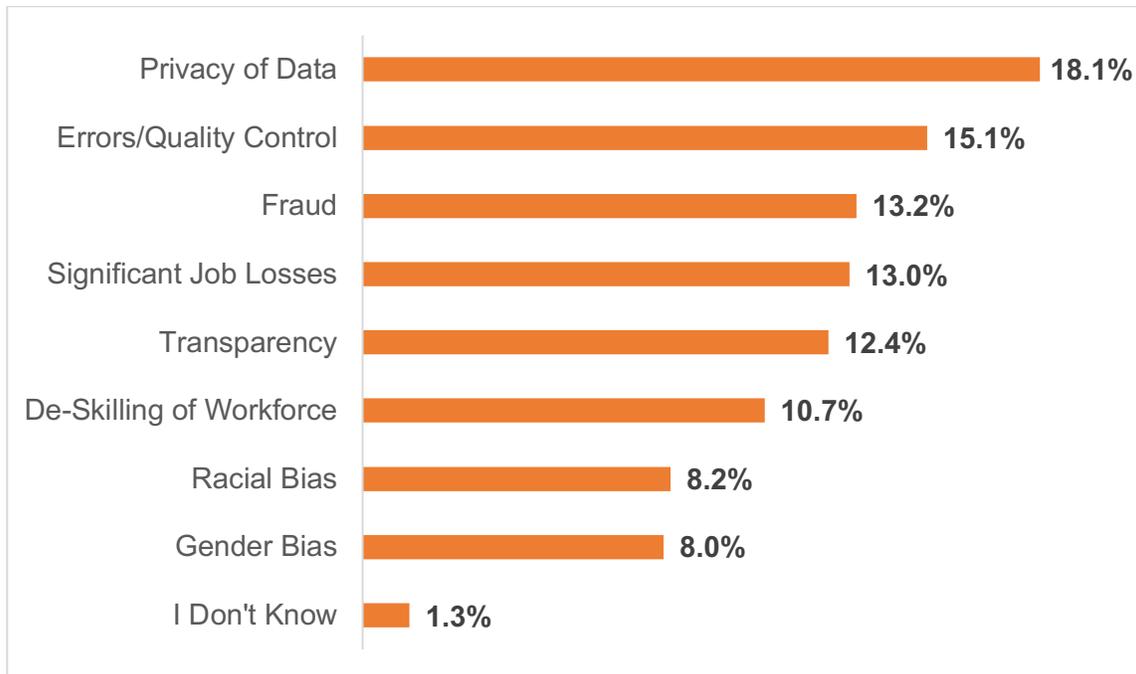


Chart 2.175: Ethical Challenges to AI Integration as Mentioned by Respondents by Number of Respondents



Respondents provided further color in open-ended responses. One participant, concerned with ethics and practicality, stated that, "Significant job losses worries me because AI doesn't need to be paid like humans, so that worries me. AI will give you free labor." A participant asked that AI developers prioritize the issue of racial bias in AI. He stated, "racial bias is a huge distractor – AI could find ways of reminding people of their bias when making selections." The same commenter outlined a hope that AI could help people rid themselves of their racial bias. He suggested to "create filters to match familiarity to the user and then gradually train the receiver over time to alter their lens (subliminally and also adjusting to how the user responds)."

Question: How would you categorize your current attitude towards AI?

Question: How would you categorize your current attitude towards Artificial Intelligence? (Click all that apply)

The overall dominant emotions that describe the attitude towards artificial intelligence are interested, fascinated, and cautious (Chart 2.18) (Chart 2.185).

Chart 2.18: Dominant Emotions Towards AI in Percentage

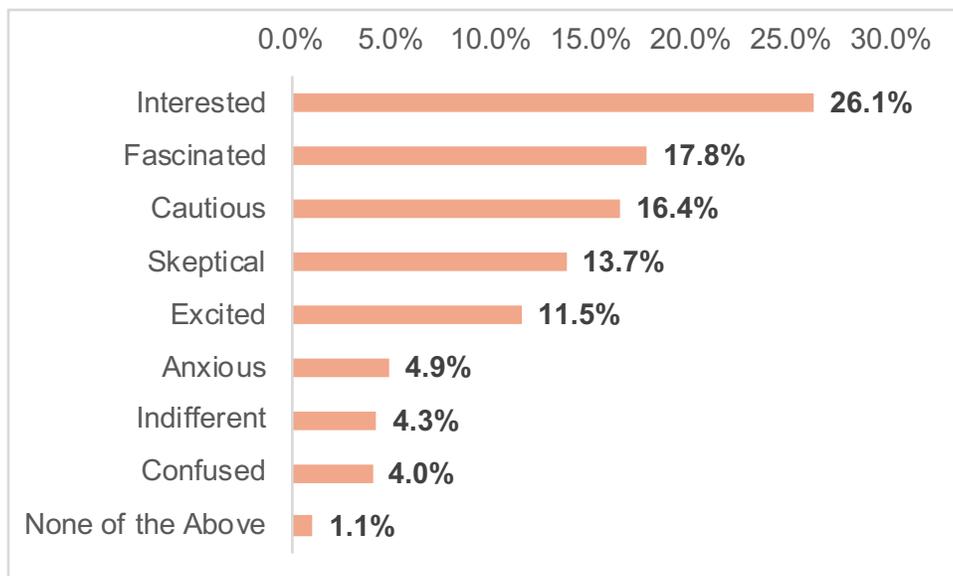
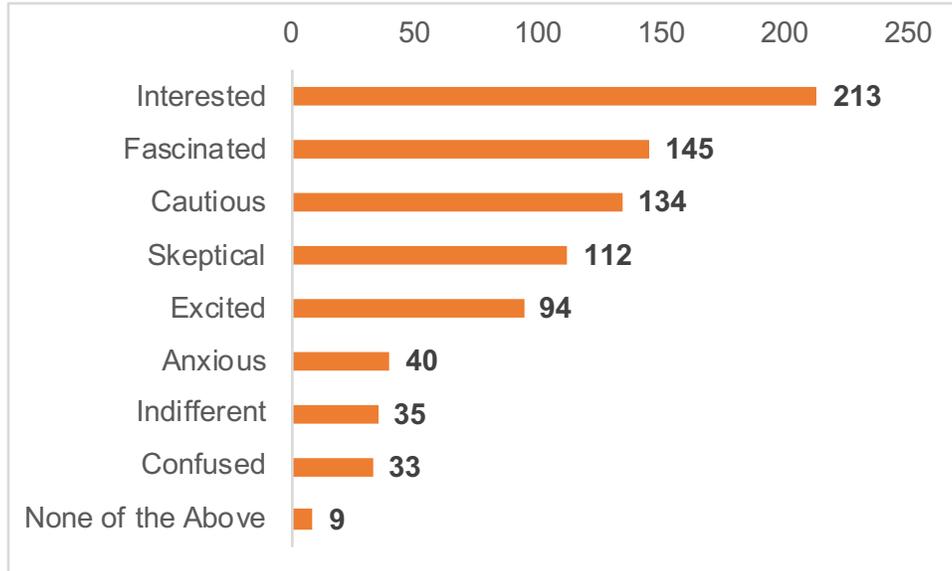


Chart 2.185: Dominant Emotions Towards AI by Number of Respondents



However, there is a significant difference in particular emotions between Wave 1 and Wave 2. Wave 2, the younger sample, has more mentions for skeptical (39% vs 10%), cautious (37% vs 22%), anxious (13% vs 4%), all of which are higher than expected based on the size of the surveys. Also, Wave 2 had a higher understanding of AI. Participants of Wave 2 may have an inkling that AI will impact their careers in the future, whereas Wave 1 executives may be thinking of AI as a problem for the next generation.

Question: Finally, in a couple of sentences, in your opinion, what does the future of Artificial Intelligence look like for the ad industry?

Question: Finally, in a couple of sentences, in your opinion, what does the future of Artificial Intelligence look like for the ad industry? (Open-ended).

The thesis survey results paint a mixed picture of the future of AI-enabled marketing. Participants provided answers to the survey's future focused question, "Finally, in a couple of sentences, in your opinion, what does the future of Artificial Intelligence look like for the ad industry?"

Respondents' answers to this summary/open-ended question fall into three distinct buckets:

*Optimistic* – those who see nothing but the positive aspects of the adoption of AI

*Balanced* – those who see the pros and cons

*Pessimistic* – those who see nothing but downside from the adoption of AI

Optimistic answers hold out great hope for the transformation of strategy, media accuracy, transparency, and in some cases, the re-invention of the ad industry.

Balanced answers vary between thoughtful opinion and general observation, and, in

many instances, focus on specifics about the applications of AI. Pessimistic answers

offer a range of fear-based responses driven by worries of job loss, a core belief that AI

can never replace creativity, and a fundamental cynicism about the ad industry's ability to adapt.

One optimistic respondent wrote about the positive impact AI will have on the industry. He stated, "AI will help us get to the core of how marketing works; the psychology of marketing will become even more important. What triggers and stimulus does it take to make people act? AI will help us get smarter about the human element of marketing."

Another optimist explained that AI was crucial for marketers to make the most of data. She said, "Data is key in understanding your audiences and customers. AI makes it easier for marketers to analyze massive streams of data, also known as big data. Once it was quite impossible to sort through all of the vast amounts of data available, now AI can efficiently process it. So instead of spending time on tedious, repetitive tasks, Marketers can shift that valuable time to more creative and strategic thinking."

A third optimist expressed enthusiasm for AI tempered by pragmatism concerning when machine-learning advances would appear. She stated, "The future of AI for the ad industry is exciting, but there is some time before it becomes widely accepted. It is something that is bound to happen due to the amount of research and money being sunk into it and the fact that it has proven application that not only saves time and money but allows us to be smarter with advertising."

Lastly, an optimistic respondent positively exclaimed, "I hope that AI becomes the best partner we have, allowing us to focus on human skills like creativity."

More balanced respondents wrestled with the pros and cons of AI. One ventured, "It looks promising with a little bit of skepticism. I'm excited and worried at the same time. I just hope they don't take over everything and ruin everything." Another participant echoed, "It can be helpful but can become dangerous. There could be way too much behind the scenes stuff happening for personal gain. It (AI) is definitely increasing but should be done so carefully."

Other balanced respondents highlighted the inescapable nature of AI. One commented that AI was "Mainly inevitable. So many processes in so many industries are affected by the spread of analytics and operations research, of which artificial intelligence is a part, that it's bound to become more and more necessary to use just to keep up. I imagine there will be a decent amount of stumbling in the next few years as people adopt its use but after that, things will smooth out and it will simply be normal."

Some balanced participants saw promise in AI, but ultimately decided that machines would not challenge the primacy of humans from a strategic or creative perspective. One outlined that his attitude towards AI was, "Challenged, some of the recent forays into AI activities resulted in significant gender bias, imagine this would play into racial and ageism. I think the more analytical and technical aspects of advertising will be supported and augmented by widespread AI adoption. I don't believe it will ever possess the power to replace human creativity, writing prowess, or compassion."

Many balanced respondents highlighted the major macro issues that required more consideration and time. One opined, "AI holds a lot of promise to revolutionize the way we run advertising. But it's just in the beginning stages of being truly effective. People will need to change skill sets, and learn to be AI/robot babysitters for a number of years, as they already are, in order to keep the tech on track. Technology is not and never will be a silver bullet without human intervention, at least not yet, and not in advertising."

Interestingly, one balanced participant saw data regulation as being the critical lever to AI usefulness and adoption. He penned, "Without strong data privacy regulation, AI will completely remake the industry, everything will change. With strong data laws, it will have very significant, but somewhat less, impact as a lack of quality data will hamper it."

Pessimistic responses voiced cynicism, fear, and lack of results to date. One respondent stated, "Typical hype boom-bust, unreasonable expectations followed by poorly executed implementations resulting in disillusionment. It will take time for it to work well."

Another respondent voiced concerns of misuse. One respondent explained, "I think AI will bring sinister people tools to manipulate and harm the common man, both through security concerns and fraud (no transparency in business) as well as dumbing down of the creative sphere of our world."

Others frankly did not welcome the technological change and did not give humanity much credit in terms of its ability to process, think, and plan for AI-driven change. He commented, "I think the future of AI in the ad industry is unnecessary. However, I know many will flock to it, if only to satisfy the need for instant gratification - from certain consumers. Some may also use it to manipulate the promotion of products in a way that will grab the easily influenced, as well as those who do not bother to do even the most basic research."

Some used the topic to challenge the industry in general and call for total change. One observed, "I don't think AI can do enough. The industry needs to be completely retooled from the top down. Advertisers have a perverse delusion that they're providing value to consumers, but in reality, little to no consumers care about the ads they're delivered and are in fact annoyed by them. The Ad industry is basically the same as it was 70 years ago. There's a wild lack of innovation for a group of people whose number one buzzword is innovation."

Lastly, others remained unconvinced that things would improve based on overpromises from previous technological advancements. A respondent stated her view on AI was, "Murky, since other data-assisted roles such as programmatic, SEO, and so many others have not driven material revenue or profitability gains, and have had a spate of issues related to fraud, waste, misuse, and brand risk."

Based on the research findings, practitioners have general awareness of and exuberance for AI but are fearful of the unknown future world taking shape that they do not understand.

Some of the other questions touched upon the topic of creativity. One open-ended question asked specifically what roles respondents believed could not be replaced by AI and creative development was, by far, at the top of the list, with over twice as many respondent answers (68) versus the second most popular comment, strategy (31). A few respondents went so far as to be specific stating, "writing a brief vs. editing copy." Creativity also appeared in the open-ended responses about the future of AI. One respondent wrote, "I don't believe it (AI) will ever possess the power to replace human creativity, writing prowess, or compassion." Creativity is an area where respondents remain confident and somewhat protective. Another survey participant wrote, "Creative directors can be influenced by AI." Marketers are open to AI support but remain unconvinced that creative ideas can be developed by machines.

## *2.6 Age Differences in the Study*

### *Structure of the Sample*

The study split the cohort into Under 30 and Over 30 with robust samples of each: 65% of the sample was under 30, 31% was over 30 and 3% of the study preferred not to say. Of the younger age group, 68% of the sample were female, with 31% male, 2% other

gender/prefer not to say. For the older age group, the female cohort represented 31% of the sample, with 69% being male, 2% other/prefer not to say.

The age groups differ slightly in terms of their employment by company type: the younger group are more likely to work at a public relations firm (14% for under 30 vs. 5% for over 30) and more likely to work at a digital/social platform (15% for under 30 vs. 11% for over 30). Conversely, the older group are more likely to work at a marketing department at an enterprise (34% for over 30 vs. 31% for under 30) and a digital agency (14% for over 30 vs. 8% for under 30).

#### *Key Commonalities and Differentiations of Over and Under 30 Groups*

Overall the two age cohorts have consistent attitudes to the broader areas of the study, specifically:

1. Their ratings of their understanding of AI are the same;
2. Their definitions of AI and the challenge to choose one definition is the same;
3. Both age groups rate AI's potential for creativity low;
4. The majority of both age groups do not receive AI training at their place of employment;

There are specific areas in which the age groups differ, specifically:

1. Tasks that can be replaced by Artificial Intelligence: When respondents gave their opinion on what advertising and marketing tasks AI was likely to replace, assist, or could never replace, the younger age cohort were distinctly more

likely to believe that AI could replace tasks that the older age cohort felt were largely irreplaceable. Specifically, 15% of respondents under 30 felt that AI could replace brainstorming vs. only 4% of the older 30 cohort. Similarly, 23% of the under 30 cohort felt that AI could replace marketing strategy, compared to 7% of under 30 respondents. A similar trend exists in creative production applications of AI: 27% of younger respondents felt that AI could replace graphic design vs. 13% of the older group; 37% of the younger respondents felt that AI could replace copywriting, vs. just 17% of the older group. When it comes to tasks like Site Optimization and Data Analysis, the groups are largely similar.

2. **Barriers to AI Adoption:** When asked, “Which aspects of AI in marketing and advertising do you think present challenges and barriers to adoption”, the age groups rated different aspects as the most significant barriers to adoption. Specifically, the under 30 cohort rated Training at 10.4% of responses and Complexity of Problem Solving at 9.9% of responses as the most significant barriers to adoption. The older cohort saw different barriers as being most significant, with Investment/Budgetary Constraints at 10.4% of respondents, and Missing or Poor-Quality Data at 10.3% of respondents.
3. **Knowledge Gaps in Current Role:** When asked, “What aspects of AI do you feel you need to know more about in your current role?”, the two groups had very similar priorities when it came to adding to their knowledge base. The older cohort were more interested in understanding Predictive Messaging (10.7% of over 30 respondents vs. 7.6% of under 30 respondents) and AI

- Fundamentals (8.5% of over 30 respondents vs. 6.9% of under 30 respondents). The younger cohort felt strongly that they needed to know more about the Coding and Processing of AI, rating it 8.6% of the under 30 group vs. only 5.6% of the older group.
4. Sources of AI Education: When asked “When considering information and education in AI, which sources would you use?”, the two age groups had different sources of learning. The younger age group gravitated towards sources that were easy to access: Free Online Courses (11.2% of the under 30 group vs. 8.2% of the over 30 group); and Marketing/Advertising Industry Press (15.4% of the under 30 group vs. 12.5% of the over 30 group). The older group used sources that were typical of a more senior cohort: they were more likely to Test AI Applications myself (11.6% of the older group vs. 9.0% of the younger group) and Consult with Colleagues (9.6% of the older group vs. 7.1% of the younger group). Both groups, however, rated Google AI Machine Learning Courses as their most frequent source of AI education.
  5. Ethical Concerns about AI: When asked, “Thinking about the advertising/marketing industry, which ethical challenges concern you?”, the age groups diverged on what they felt were the most significant ethical concerns. The older cohort felt that Privacy of Data (19.3% for the over 30 group vs. 15.7% for the under 30 group), Errors/Quality Control (15.5% for the over 30 group vs. 13.6% for the under 30 group) and Transparency (13.2% for the over 30 group vs. 10.9% for the under 30 group) were the most significant issues. Conversely, the younger cohort felt that Significant Job

Losses (15.9% of the under 30 group vs. 11.6% of the over 30 group) was the most significant ethical concern.

6. Emotional Attitudes towards AI: When asked “How would you categorize your current attitude towards AI?”, the age cohorts had different emotional stances. The Younger group are far more likely to feel Skeptical (17% of the under 30 group vs. 12% of the over 30 group), Cautious (19% of the under 30 group vs. 15% of the over 30 group) and even Anxious (8% of the under 30 group vs. 4% of the over 30 group). The older group tend to have more positive emotions towards AI, with 20% of the over 30 group feeling Fascinated (vs. only 13% of the under 30 group) and 13% of the over 30 group feeling Excited (vs. 8% of the under 30 group).

## *2.7 Gender Differences in the Study*

### *Structure of the Sample*

In terms of the total sample, the study represented a balanced split between women (56% female) and men (44% male) with 3% preferring not to say. Within the genders, the sample for women is younger at 46% under 30 and 54% over 30, compared to the male sample, which tracks at 35% under 30 and 65% over 30. The genders differ slightly in terms of their area of the marketing industry. The genders have some small variation in terms of the area of the industry that they work in, but the variations are not enough to be statistically significant.

### *Where the genders differ*

Overall the two genders have consistent attitudes to the broader areas of the study, specifically:

1. Their ratings of their understanding of AI are the same;
2. Their definitions of AI and the challenge to choose one definition is the same;
3. Both genders rate AI's potential for creativity low;
4. The majority of both genders do not receive AI training at their place of employment;
5. Both genders look to the same sources for further education in AI.

There are some variations between the genders when we dig into specific issues, specifically:

1. Tasks that can be replaced by Artificial Intelligence: When respondents were asked to give their opinion on what advertising and marketing tasks AI was likely to replace, assist, or could never replace, the female group of respondents were less likely to believe that AI could replace a task entirely. The tasks they believed could not be replaced by AI were Video Editing (12.8% for women vs. 23.2% for men), Media Planning (21.8% for women vs. 31.5% for men) and Influencer Marketing (9.6% for women vs. 16.2% for men). Overall the female sample was more likely to say they didn't know (4.7%) vs. the male sample (2.4%).
2. Barriers to AI Adoption: The female group of respondents saw specific barriers as being more significant for the adoption of AI when asked "Which aspects of AI in marketing and advertising do you think present challenges and barriers to

adoption?”. The female cohort saw “too risky” as being higher than the male cohort (21% for women vs. 15.8% for men), Investment/Budgetary Constraints (45% for women vs. 35% for men), IT Infrastructure (39% for women vs. 30% for men). Interestingly, bias was cited as a stronger barrier by the male cohort, who rated it 35.8% vs the female cohort who rated it at 29% as a barrier.

3. Knowledge Gaps in Current Role: When asked “What aspects of Artificial Intelligence do you feel you need to know more about in your current role?”, female respondents were more likely to identify Data Organization and Structure (46.9% for women vs. 35.3% for men), Security/Privacy Issues (40.8% for women vs. 30.2% for men), Predictive Messaging (44.1% for women vs. 33.5% for men) and Programmatic Advertising (44.8% for women vs. 35.7% for men). In other categories, men and women felt the same in terms of identifying which areas they need to know more about AI.
4. Ethical Concerns about AI: When asked, “Thinking about the advertising/marketing industry, which ethical challenges concern you?”, men were more likely to be less concerned overall with ethical challenges at an average of 35.8% across all concerns, vs. women, who averaged 39.9% across all concerns. As we look across which specific concerns rate higher for women, gender bias is an ethical concern to examine. As a group, 28.8% of women cited this as a concern vs. 22.4% for men. However, there are other significant differences in ethical concerns: Privacy of Data (66.6% for women, 58.9% for men), De-Skilling of the Workforce (40.5% of women vs. 30.5% of men), and Racial Bias (31.8% for women vs. 25.4% for men).

## 2.8 Summary

To explain where the advertising industry is in terms of AI today, and for the purposes of this thesis, a simple cycle has been developed called BEES that has the following phases:

- 1) *Breakthrough* – The combination of attributes that make an idea or theory become a possibility and an early stage/academic example
- 2) *Expectation* – The curiosity of the media to explore and consider how such technology could impact business and humanity.
- 3) *Experimentation* – The pioneering phase where entrepreneurs and industry leaders begin to roll-out example after example of the technology and begin investing.
- 4) *Scale* – Create all elements that one needs to implement a scaled AI solution, including organizational change, education, ethical oversight, and energy.

Based on the research study, the advertising industry finds itself squarely between expectation and experimentation. Survey respondents appear intrigued by the elements that need to be considered to scale AI. However, few practitioners implement the changes broadly.

The survey shows that respondents, a representative sample of the ad industry, clearly see AI as a disruptive force, but they do not fully comprehend all the ways it will disrupt

or why. There is fear of the unknown impact that AI might have and a strong vein of belief in the human primacy to create and be strategic. There are some interesting differences regarding age as one certainly views a generational divide on the perception of AI. And in terms of gender, one views women having a greater concern on ethical issues across the board. The rest of this thesis explores all aspects of this survey weighing results alongside the usage and development of AI in advertising.

# Chapter 3. Collective Definition and Understanding of AI

## 3.1 Introduction

Devin Wenig, the CEO of eBay, proclaimed in his ShopTalk Conference keynote in Las Vegas in 2017, "If you don't have an AI strategy, you are gonna die (Unemyr, 2018)." If Wenig's proclamation rings true, then the marketing industry has a lot of catch up work to do. The research study for this thesis highlighted that respondents shared no standard definition for AI. Survey participants scored their understanding of AI, on average, only a 3 out of a possible 10. Many scholars and data scientists have worked to define the field of AI, and the history of theory and practice of the AI space is well-documented. In this chapter, one will look at the definitions of core AI terms that signify areas where marketers have some level of awareness but indeed not clarity. The section will also look at the rich history of AI development and areas of importance to the marketing profession. The limited background and knowledge that marketers have

of AI hinders the application of machine learning today and eliminates planning for the future of AI.

### *3.2 Definition of AI*

Survey results showed a lack of agreement and understanding around a standard AI definition amongst the respondents. However, it should be made clear that there is an absence of consensus in general around a definition of AI. Josh Engroff, founder of Marzipann, a start-up offering machine learning for predictive analytics and marketing automation, joked about the AI definition provided by, Peter Norvig and Stuart Russel's textbook, "Artificial Intelligence: A Modern Approach." The text actually, "lays out no fewer than eight!" definitions of AI (Engroff, 2018).

Not only are there several definitions of AI, many believe the category AI itself is too broad and unhelpful. Benedict Evans of venture firm Andreessen Horowitz wrote that explaining machine learning is hard but, "This isn't helped by the term 'artificial intelligence,' which tends to end any conversation as soon as it's begun. As soon as we say 'AI,' it's as though the black monolith from the beginning of 2001 has appeared, and we all become apes screaming at it and shaking our fists. You can't analyze 'AI.' (Evans, 2018)."

Russell and Norvig provide a useful categorization of AI definitions from previous scholarship that give a sense of the dimensions of the complexity around finding a collective meaning for the term (Russell and Norvig, 2003).

1) Systems that think like humans:

"The exciting new effort to make computers think ... machines with minds, in the full and literal sense (Haugeland, 1985)."

"The automation of activities that we associate with human thinking, activities such as decision-making, problem-solving, learning (Bellman, 1978)."

2) Systems that reason:

"The study of mental faculties through the use of computational models (Charniak and McDermott, 1985)."

"The study of the computations that make it possible to perceive, reason, and act (Winston, 1992)."

3) Systems that act like humans:

"The art of creating machines that perform functions that require intelligence when performed by people (Kurzweil, 1990)."

"The study of how to make computers do things at which, at the moment, people are better (Rich and Knight, 1991)."

4) Systems that act rationally:

"A field of study that seeks to explain and emulate intelligent behavior in terms of computational processes (Schalkoff, 1990)."

"The branch of computer science that is concerned with the automation of intelligent behavior (Luger and Stubblefield, 1993)."

Stuart Russell and Peter Norvig summarized their ideas and defined AI as "the designing and building of intelligent agents that receive percepts from the environment and take actions that affect that environment (Russell and Norvig, 2003)."

This thesis utilizes the Russell and Norvig definition while remaining aware of the critiques of other scholars. For example, Pei Wang of Temple University disputes the circular logic of using intelligence to define artificial intelligence in the Russell and Norvig description (Wang, 2008).

As Jim Sterne, author of *Artificial Intelligence for Marketing*, commented during a one-on-one interview, "AI is an umbrella term that people use inaccurately and loosely."<sup>1</sup> If one returns to the original use of AI, it was a catch-all. McCarthy's Dartmouth Conference proposal that kicked off the field of AI aimed to include several sub-topics. McCarthy wrote, "We propose that a two month, ten man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves (McCarthy, 1955)."

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<sup>1</sup> Interview with Jim Sterne. Over the Phone, 21 May 2019

AI is a container term with several sub-category support words or phrases that reference key elements. The twin terms of weak AI and strong AI appear in marketing literature often to explain the sophistication of a particular AI-based system. Weak AI refers to a machine learning solution dedicated to one specific task such as optimizing the price of a product or the send time of an email. Strong AI, on the other hand, alludes to a general-purpose system that can reason on its own, solving problems it has not been trained to do in advance (Unemyr, 2018). Strong AI points to what is known as Artificial General Intelligence (AGI), where a system could think and develop a sense of self-awareness.

The term machine-learning almost gets used interchangeably for AI in marketing circles. Machine-learning refers to the popular, modern-day technique for creating software that learns from data (Olson, 2018). There are many subsets of machine learning.

Supervised learning is one sub-group where data gets labeled before processing. AI Ethics Research Analyst Susan Etlinger explains, "For example, one might train a computer with 500,000 photos that are tagged "fruit" and "apple," 500,000 photos that are tagged "fruit" and "orange," and 500,000 each of other objects. When you show the computer an unlabeled photo of an apple, it will attempt to classify it given the categories it has been exposed to (Etlinger, 2017:7)." Reinforcement Learning is a type of supervised learning in which the computer trains itself continually using trial and error to improve its outcomes. This type of training is the technique used by Google DeepMind to train AI program AlphaGo (Etlinger, 2017:7).

The second sub-group of machine learning is unsupervised learning. This subset of machine learning is less structured. In this area, the machine sorts unstructured information and categorizes it based on attributes, such as size, shape, and color on its own. Etlinger explains, "In this example, you might show the computer 100,000 photos each of different types of fruit but not specify what they are. The computer will cluster the data and draw inferences about what they are and how they relate to each other (Etlinger, 2017:7)."

One branch of unsupervised learning receiving attention is deep learning. Deep learning consists of running data through an artificial, neural network that roughly simulates the behavior of neurons in the human brain. This branch translates things people can easily perceive into something computers can recognize and interpret (Etlinger, 2017:7) (Simpson, 2018). The difference between neural networks and deep learning lies in the depth of the model. Deep learning is a phrase used for complex neural networks (Löfwander, 2017).

Voice and speech are primary AI data-points, and the related sub-field of AI, Natural Language Processing (NLP), garners much focus by marketers. Alexa sold more than 100 million devices with the AI-Alexa assistant pre-installed (Matney, 2019). NLP is about processing text which, for example, can be to check grammar or conduct some form of analysis that does not require to understand the writer's intent. Natural Language Understanding (NLU) builds upon NLP. NLU focuses on building models that comprehend the actual meaning of a text. Some examples of NLU include knowing that

an email is about booking a meeting or a price request for a particular service, even taking the current context of the conversation into account.

The term Conversational AI appears in relation to NLP or NLU. Conversational AI is the concept of artificial intelligence assistants that can converse with people in a human-like way. One of the earliest conversational AI assistants, ELIZA, was created at the MIT artificial intelligence laboratory in the '60s. ELIZA captured the popular imagination, but the actual assistant did not have access to the semantic representation of the natural language messages the user was sending it (Reddy, 2018).

The word predictive or predictive marketing is often used in tandem or in place of AI. Leading AI scholar Ajay Agrawal wrote the book *Prediction Machines* and highlighted a critical insight that helps define AI. Agrawal writes, "Our first key insight is that the new wave of artificial intelligence does not actually bring us intelligence but instead a critical component of intelligence – prediction. What Alexa was doing when the child asked a question was taking the sounds it heard and predicting words the child spoke and then predicting what information the words were looking for. Alexa doesn't "know" the capital of Delaware. But Alexa is able to predict that, when people ask such as question, they are looking for a specific response, Dover (Agrawal, 2018)."

Lastly, one would be remiss not to mention a phrase that has seeped into modern marketing vernacular, the Singularity. The Singularity is futurist Ray Kurzweil's description of the moment where machines become smarter than man. Kurzweil's idea

is often eluded to when describing the dystopic future that AI promises. He explains that machines will become more intelligent than humans by 2045 (Unemyr, 2018).

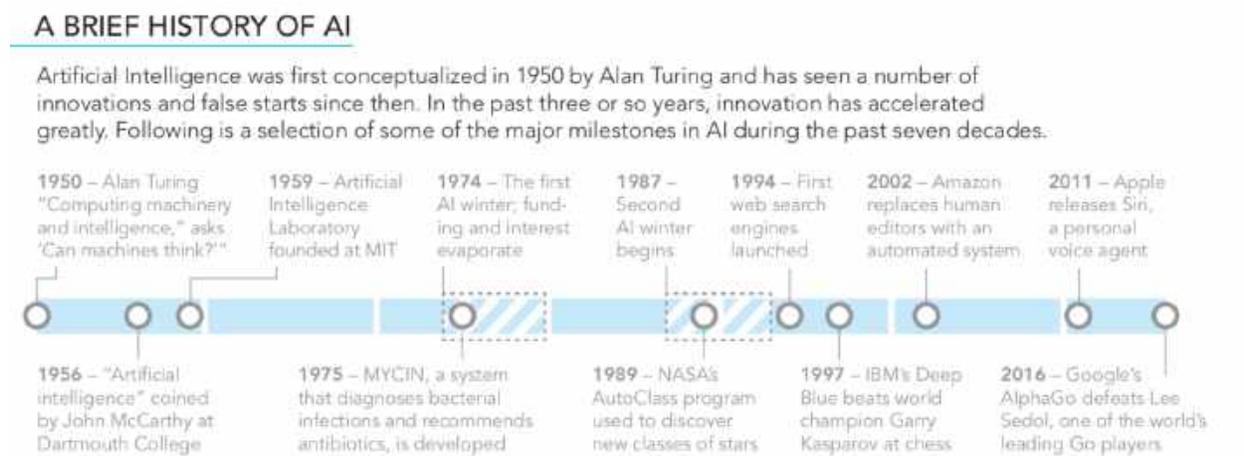
The confusion surrounding the term Artificial Intelligence seems sensible in that it is a vessel phrase for a broad field with several sub-components. It is fair that respondents to the survey would have limited understanding of such an unclear term. Unfortunately, all of the AI-related phrases get utilized as synonyms for AI at times. As AI becomes more of a fundamental part of marketing, understanding of the term and all of its sub-elements will increase. For now, definition remains in a state of confusion, which does not help with awareness, knowledge, and practice of AI-related marketing.

While understanding and knowledge remain low for such terms one can expect over the next three years, as education in and usage of AI improves, advertising executives will have more familiarity of these areas as it will be critical to perform the functions of their jobs.

### *3.3 Understanding the History of AI*

What became clear through primary research is that what appears in the survey respondents' perceptions when it comes to AI is not the factual history of its development, but the fictional Hollywood-driven Terminator/Matrix dystopia. This lack of factual historical grounding is one reason leading to the current state of AI unpreparedness in the marketing profession.

Chart 3.1: The Timeline of AI (Etlinger, 2017:6)

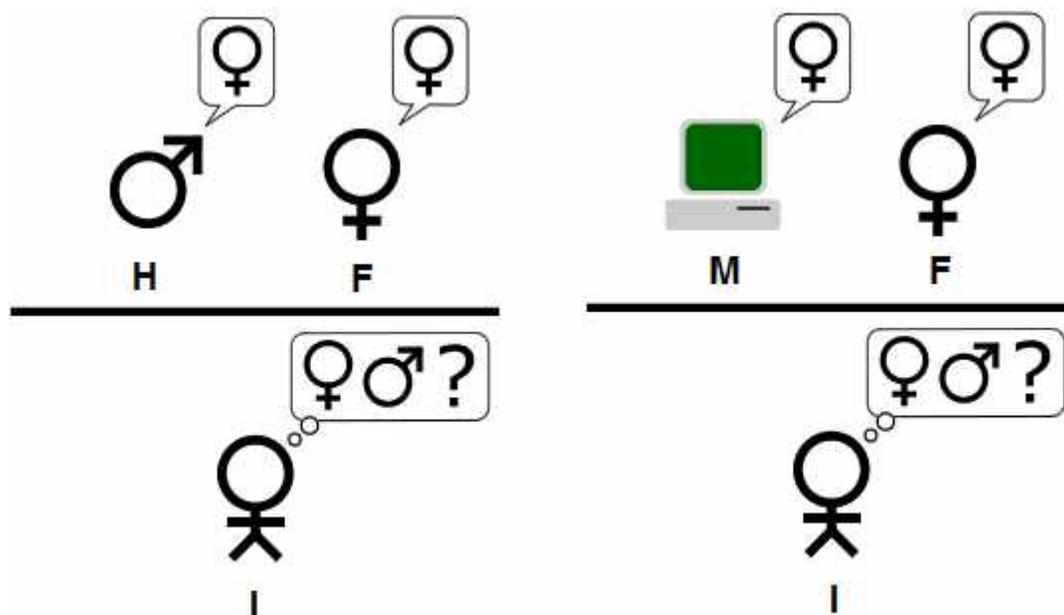


Etlinger's brief history outlined above maps several of the key elements to review with a couple of significant events missing (Chart 3.1) (Etlinger, 2017:6). For example, in keeping with a thesis titled "I think therefore I am..." one must start with Descartes. Descartes explored the philosophical rationale for being but also considered robotics and sentient beings. Descartes pondered the possibility that machines would one day think and make decisions. Amazon's Alexa and other advances in NLP and NLU disprove Descartes' argument that machines would never talk like humans. However, he did succeed in explaining the difference between devices that can perform one task versus machines which can adapt to several different jobs (Haldane and Lindsay, 2016).

Alan Turing's work ushered Descartes' studies into the modern computer era. Turing's seminal research piece, titled "Computing Machinery and Intelligence," posed the fundamental question that drives AI thinking in the context of computer science. His thesis outlines, "I propose to consider the question, "Can machines think?" I believe in

about fifty years it will be possible, to program computers, with a storage capacity of about  $10^9$ , to make them play the imitation game so well that an average interrogator will not have more than 70 percent chance of making the right identification after five minutes of questioning.

Image 3.2 The Imitation Game (CanalBlog, 2012)



The original question, "Can machines think?" I believe to be too meaningless to deserve discussion. Nevertheless, I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted (Turing, 1950)."

In his paper, Turing proposed a twist on what is called "The Imitation Game" (Image 3.2) (CanalBlog, 2012). The Imitation Game involves no use of AI, but rather three human participants in three separate rooms. Each room connects via a screen and

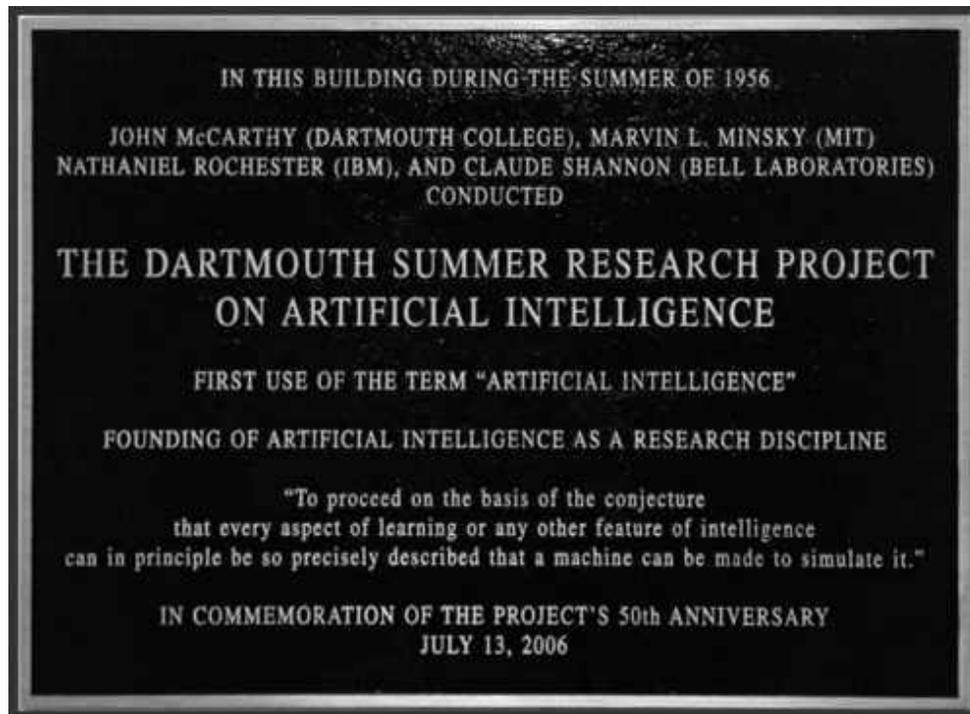
keyboard, one containing a male, the other a female, and the other holding a male or female judge. The female tries to convince the judge that she is the male, and the judge tries to disseminate, which is which. Turing changes the concept of this game to include an AI, a human, and a human questioner. The questioner's job is then to decide which is the AI and which is the human (Rouse, 2019). Today, the Turing Test is a method of inquiry in AI for determining whether or not a computer is capable of thinking like a human being.

While Turing received limited praise for his work during his lifetime, as AI comes to fore, his accomplishments are being noted. The UK recognized Turing's importance in saving and shaping the modern world in 2019 by putting him on the 50-pound note. "Alan Turing was an outstanding mathematician whose work has had an enormous impact on how we live today," said Bank of England governor Mark Carney. "As the father of computer science and artificial intelligence, as well as a war hero, Alan Turing's contributions were far-ranging and path-breaking. Turing is a giant on whose shoulders so many now stand (Peachey, 2019)."

The next major milestone was the 1956 Dartmouth Artificial Intelligence (AI) conference which gave birth to the field of AI (Image 3.3) (RLA Academy, 2018). John McCarthy invited leading researchers of the time in a range of advanced research topics such as complexity theory, language simulation, neuron nets, abstraction of content from sensory inputs, relationship of randomness to creative thinking, and learning machines to Dartmouth College to discuss a subject so new that he coined a new term for it,

Artificial Intelligence. This conference gave birth to AI and the interdisciplinary research that aims to make computers as intelligent as humans (Solomonoff, 1985).

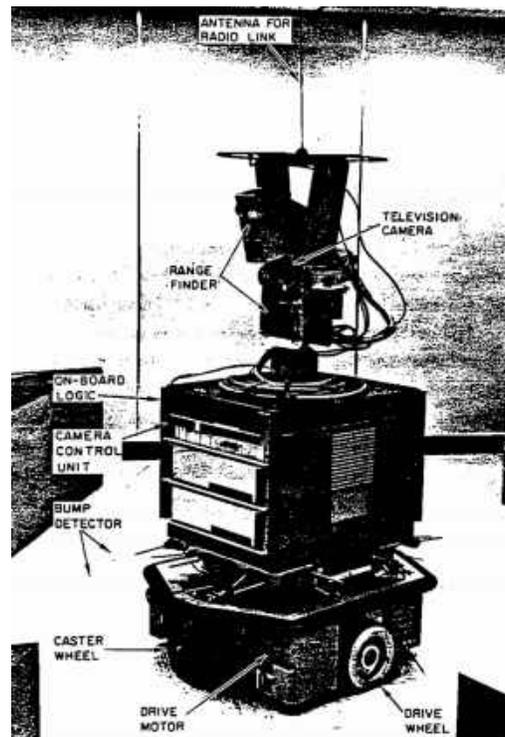
Image 3.3 Artificial Intelligence Plaque (RLA Academy, 2018)



Fast forward to 1966 and the creation of ELIZA, developed at MIT by Joseph Weizenbaum. ELIZA was perhaps the world's first chatbot – and a direct ancestor of the likes of Alexa and Siri. ELIZA represented an early implementation of NLP, which aims to teach computers to communicate with us in human language, rather than to require us to program them in computer code, or interact through a user interface. ELIZA did not talk like Alexa; instead, she wrote in computer text, and in the process paved the way for further work in NLP and NLU (Marr, 2018).

If ELIZA was a breakthrough in terms NLP, the creation of Shakey was a leap forward for a range of AI related disciplines (Image 3.3). Developed at the Artificial Intelligence Center of Stanford Research Institute, Shakey the robot was the first general-purpose mobile robot that reasoned about its actions. It analyzed commands and divided them into pieces by itself that would then lead to action.

Image 3.4 Shakey the Robot (SRI International, 2019)



A version of Shakey's world could contain several rooms connected by corridors, with doors and light switches. Shakey would interact with elements and move about this environment. For example, an operator would type a command like "push the block off the platform" at a computer console. Shakey would then look around the space and identify a platform with a block on it. The robot would then locate a ramp to reach the platform. Shakey would then push the ramp over to the platform, roll up the ramp onto the platform, and push the block off the platform (SRI International, 2019).

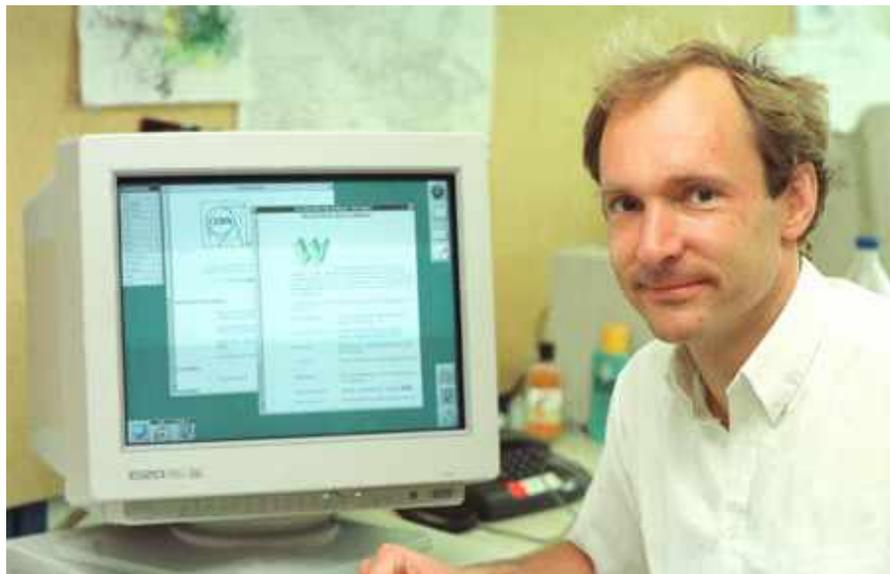
Many of the innovations from Shakey's development shaped further AI work that one sees in applications like Uber or driverless features in Tesla today. Breakthroughs from the Shakey work include the search algorithm, which is widely used in pathfinding and graph traversal, the process of plotting an efficiently traversable path between points, the Hough transform which is a feature extraction technique used in image analysis, computer vision, digital image processing, and the visibility graph method for finding Euclidean shortest paths among obstacles in the plane (Lozano-Pérez, Tomás, Wesley, Michael, 1979).

Funding for AI slowed in the Seventies and activity did not reach fever pitch again until the eighties. In some ways, this lull is a milestone for AI in and of itself. Periods where pessimism sets in and funding dries up for AI related projects is known as an AI Winter. In 1984, at the American Association of Artificial Intelligence, two leading AI researchers, Robert Schank and Marvin Minsky, warned the attendees of the AI Winter of the early to mid-seventies where excitement and capital for AI disappeared and that

irrational exuberance for the field must be contained. As the world experiences another AI growth spurt now it is important to assess whether the hype is running too far ahead of reality (Crevier, 1993).

The late eighties and early nineties ushered in the beginning of the Internet era with its rush of digitized data which fuels AI. In 1991 CERN researcher Tim Berners-Lee put the world's first website online and published the workings of the hypertext transfer protocol (HTTP) (Image 3.5) (Tuttle, 2013). Computers had been connecting to share data for decades, mainly at educational institutions and large businesses. However, the arrival of the worldwide web was the catalyst for society at large to plug itself into the online world and start to share and collect tons and tons of data (Marr, 2018).

Image 3.5 Tim Berners-Lee (Tuttle, 2013)



The internet's early wave of development captivated the marketing world as every brand and company built first-version websites, and new types of services appeared. In terms of AI, the milestone that stunned the advertising world and captured the imagination of a generation of AI computer scientists was IBM's Deep Blue victory over the greatest chess player in the world at that time, Garry Kasparov. IBM's computer calculated all options at high speed rather than analyzing gameplay and learning about the game (Image 3.6) (Friedman, 2015). For this reason, it was not what one would imagine as AI today. However, it provided the perception of thinking and received extensive media exposure.

Image 3.6 IBM's Deep Blue beats Garry Kasparov (Friedman, 2015)



IBM remained at the forefront of AI development and in 2011 once again wowed the world when IBM's Watson system won Jeopardy against the best players in the world. Cognitive computing engine Watson faced off against champion players of the TV game show Jeopardy defeating them and claiming a \$1 million prize (Image 3.7) (Marr, 2016). The breakthrough that a computer system could beat humans at a language-based, creative thinking based game shocked the world.

Image 3.7 IBM's Watson wins Jeopardy (Marr, 2016)



Over the last ten years, companies such as Google and Facebook have invested heavily in AI. The tech giants hired and acquired the best AI talent wherever they could find it. Interestingly, leading tech companies acquired 90 percent of AI startups in Silicon Valley (Kottenstette, 2018). In 2012 Google broke new ground in AI when its team built a neural network of 16,000 computer processors with one billion connections and let it browse YouTube. The AI did what many web users might do; it began to look for cats.

The "brain" simulation was exposed to 10 million randomly selected YouTube video thumbnails over the course of three days and, after being presented with a list of 20,000 different items, it began to recognize pictures of cats. The system completed this task despite being fed no information on distinguishing features that might help identify one. Google's neural network achieved 81.7 percent accuracy in detecting human faces, 76.7 percent accuracy when identifying human body parts, and 74.8 percent accuracy when identifying cats (Image 3.8) (Clark, 2012).

Image 3.8 Google AI Recognizes Cats (Clark, 2012)



The academic paper surrounding the research stated, "Contrary to what appears to be a widely-held intuition, our experimental results reveal that it is possible to train a face detector without having to label images as containing a face or not (Le, 2012)."

"We never told it during the training, 'This is a cat,'" Jeff Dean, the Google fellow who led the study, told the New York Times. "It basically invented the concept of a cat (Image 3.8) (Clark, 2012)."

In 2016, Google's AlphaGo pushed AI capabilities forward once again when it went on to beat Go world champion Lee Sedol in four out of five games. In January 2017 AlphaGo won over 50 games, including one against top-ranked Kie Je. Google's DeepMind team taught and trained AlphaGo the rules of the game of Go and had it play hundreds of thousands of games to learn from its wins and losses (Image 3.9) (Reynolds, 2017).

Image 3.9 Google's AlphaGo beats Lee Sedol (Reynolds, 2017)



Companies like Uber are also active in AI implementation. The Company continues to make strides toward creating driverless vehicles. One of the special moments was when Uber started its' trials in Pittsburgh. Uber hired dozens of researchers from Carnegie Mellon University's robotics center to develop the technology. The team re-engineered and autonomously-enabled a fleet of 14 Ford Fusions equipped with radar, cameras and other sensing equipment.

A journalist wrote about her test-drive. She explained, "Once nestled into my seat; I selected a button on a tablet positioned in the back of the car to signal I was ready to go. The tablet displayed a live view of the car's vision: blue for the road, red for objects. Our driving path took us from the ATC building in Pittsburgh's Lawrenceville neighborhood through downtown and over the 9th Street bridge to the North Shore.

Image 3.91 Uber Pittsburgh Trial (Brewster, 2016)



The steering wheel turned on its own as if possessed by a ghost (Image 3.91)  
(Brewster, 2016).”

### *3.4 Summary*

The history of AI has had fits and starts but continues to press forward now at an accelerated pace. Marketers were topically aware of notable achievements such as the IBM Deep Blue and Watson victories. The agency Ogilvy created the marketing collateral and campaigns that promoted and celebrated the events. However, the knowledge and participation did not lead Ogilvy to reorganize around AI.

Is it essential for the advertising community to have a better understanding of the past of AI? To complete the day to day tasks of client work, perhaps not. However, one would imagine that better knowledge of the development of AI from the early 1950s to today might lead marketers to understand the progress and the pitfalls of progress to inform next steps. As Winston Churchill stated, “Those that fail to learn from history, are doomed to repeat it (Churchill, 1948).”

Awareness and understanding of AI will increase, but AI may not receive a tighter definition. One cannot be surprised that the thesis research participants struggled with a definition if everyone else does as well. AI will remain almost a purposely nebulous concept as the interdisciplinary field evolves and tries to contain all of the new offshoots. One finds it a bit surprising that the understanding of AI and related terms are so limited

with many free educational resources in the market as well as high-levels of media coverage. AI education will improve, and perhaps, as practitioners utilize more AI-tools for day to day assignments, understanding will increase.

Certainly for macro and major organizational or business shifts, one needs to see senior executives develop a much better idea of AI and a richer understanding of the heritage of AI. Many significant advances today can be traced back to the sixties. To push the industry to the next phase will require accelerated education of AI so that the majority of practitioners move from bewildered bystanders to empowered executives.

The chapter examined whether marketers held a collective definition of AI and what type of understanding they had on the background of the field. The research uncovered that there was no standard definition for AI amongst marketers and seasoned scholars in AI also struggled to define the emerging space collectively. Also, one found that the general understanding of AI amongst marketers was poor. Practitioners had no comprehension of the historical and technical underpinnings of the space. This exploration of marketing and AI starts with marketers having shaky foundational knowledge.

## Chapter 4. The State of AI in Advertising Today

### *4.1 Introduction*

AI is already in every marketing discipline. However, when one examines the thesis research results, one might get a sense that AI is still only a future idea. Society is stepping forward and developing AI but at the same time still uneasy with and unsure of what this building effort will bring. Leading AI scholar Kai-Fu Lee observes, "We're all full of questions without answers, trying to peer into the future with a mixture of childlike wonder and grown-up worries (Lee, 2018)."

The ad industry is taking small steps forward, preparing the building blocks needed for AI. For example, AI requires data, and the advertising industry is waking up to the importance of processing and analyzing consumer data for the next phase of advertising solutions.

Marketers are beginning to ask what AI can do for their enterprises and planning specific tasks that AI can support. As esteemed technology and marketing author Jim Sterne explained, "Firstly for AI, you need to know what you want to do. What is your plan and what problem do you want to solve? Once you have that you need to ask what data do I need to consider and will the output make sense? Will it match our goals? (Sterne, 2019)?"

The general focus of AI activity in marketing today is to replace or offer support from time-consuming, relatively unskilled tasks. Ellie Mirman, CMO of competitive intelligence platform company Crayon, outlined, "The first obvious application of artificial intelligence is to automate the tasks that we humans don't want to do – those repetitive, low-skill tasks. AI can be easily programmed to do such work and do it faster, more cheaply, and more reliably (Mirman, 2018)."

Tom Chavez, CEO, and Co-Founder of Krux (part of Salesforce), views AI eliminating workflow process so that humans will be freed up for more strategic exercises. Chavez calls it, "Salesforce's Law of Workflow." He explains Boyle's Law of gas pressure on volume as  $PV=K$ , which describes the inversely proportional relationship between a gas' pressure and its volume. Salesforce's Law of Workflow follows a similar pattern: Artificial Intelligence x Workflow = K. Put simply, as the IQ of the technology you use to run your business increases, time and resources devoted to workflow decrease proportionately. AI, when given more space to roam, naturally reduces the need for workflow. At a conceptual level, AI-enabled experiences by their very design reduce time spent

reacting, logging, and recording. They open up more opportunity for doing, thinking, solving, closing, supporting, and negotiating (Chavez, 2018).

AI is impacting every marketing discipline, and practitioners are keen on getting support with the repetitive tasks they do not want to complete anymore. This chapter aims to explore what the range of AI usage is in marketing today versus how survey respondents understand and view the role of this field.

#### *4.2 State of AI in Marketing – It Starts with Data*

While the marketing focused survey respondents may be just discovering AI, the technology industry is busy generating tools and applications to support all marketing and advertising functions. The life-blood of all of this AI development is data.

Luke de Oliveira, a leading AI innovator and visiting scientist at Berkley Labs explains, "the unsung hero of the AI revolution is data—lots and lots of labeled and annotated data, curated with the elbow grease of great research groups and companies who recognize that the democratization of data is a necessary step towards accelerating AI (Oliveira, 2017)." The explosion of data that now can be captured and cataloged is staggering. In one minute, email users send 204 million messages, Apple users download 48,000 apps, Facebook users share 2.46 million pieces of content, Twitter users tweet 277,000 times, and Tinder users swipe left or right 416,667 times

(Knoblauch, 2014). Each year, humanity spends the equivalent of 1 billion years online (Sinnott, 2018).

And the data does not just come from popular social media applications or search engines. There are thousands of public datasets that one can access and analyze. Google hosts a growing number of data sets on its BigQuery utility (Sterne, 2017).

One can access datasets such as:

1) NYPD Motor Vehicle Collisions

This dataset includes details of Motor Vehicle Collisions in New York City provided by the Police Department (NYPD) from 2012 to the present.

2) Open Images Data

This public dataset contains approximately 9 million URLs and metadata for images that have been annotated with labels spanning more than 6,000 categories.

3) USA Names

A Social Security Administration dataset that contains all names from Social Security card applications for births that occurred in the United States after 1879.

Some call this data surge the new gold rush as enterprise data analysts and data scientists aim to unlock the value of each nugget of information.

Large marketing groups are pouring investment dollars into data-focused companies. Dentsu acquired Merkle for \$1.5 billion followed by IPG acquiring Acxiom for \$2.3 billion (McGee, 2016) (Samadi, 2018), and Publicis picking up Epsilon for \$4.4 billion (Frost, 2019). The purpose of the recent acquisitions is that the large marketing holding companies need to add more data-focused talent. "The biggest challenge at most firms is developing actionable insights based on that data," said Allen Adamson, brand consultant and co-founder of Metaforce. "People are collecting mountains of data. You can find out exactly when someone is going to brush their teeth and what toothpaste they're using, but you only get to, 'So what?' The trick is to get people who can look at the data and say this is what's happening, and this is what it means (Monllos, 2019)."

As the commercial interest in data increases, the public discourse around the fair use of consumer data also expands. New laws such as the General Data Protection Regulation in Europe and the California Consumer Privacy Act aim to enhance privacy rights and consumer protections (European Union, 2018; State of California, 2018). Consumers are voting for more data privacy protections, but it remains unclear as to how far consumers want these protections to go. A study by Google and the National Research Group found a significant number of consumers willing to share some of their most personal data with voice assistant technology to have a more personalized media experience. Nearly half (46%) said they were willing to share their media consumption history and more than a quarter said they were willing to share their location history (29%), purchase history (28%) and banking information (27%). However, a much lower

percentage of consumers said they were willing to share their social media history (Mandese, 2019).

One imagines that the steady flow of customer data for commercial advantage will continue albeit with more safeguards and privacy regulations. The challenge will be to assess what is meaningful, what is not, structure it in a useful way and maintain it correctly. Chris Kieff, a marketing startup advisor, and AI, cyber-security specialist, stated, "I think that the big challenge for AI is finding high-quality data and right now a bunch of AI in marketing and security are chasing data that is garbage. Garbage in, garbage out. I think that we need to think about the data we take into AI systems (Kieff, 2019)."

Not only does the overarching quality of data need to be evaluated for AI but also, its' period of validity. Ivy Nguyen, an AI investor at Point72 Ventures, advised, "Startups must understand early on how quickly their dataset and models become outdated in order to maintain the appropriate rate of data collection and model updates (Nguyen, 2018)." Data and models become outdated when the AI model's target variable alters.

### *4.3 State of AI in Marketing – Making AI Easier to Use*

Utilizing AI data today is a manual and complex process. The cumbersome nature of the datasets acts as a deterrent to marketers. However, over the last couple of years, there has been an aggressive push to develop more off-the-shelf AI solutions that will

make it easier for people to try the technology. Roy Raanani, CEO and Founder of Chorus.ai, explains, "We are seeing the democratization of AI through open-source algorithms, affordable computing power and AI specialized hardware (Taulli, 2018)." For example, major AI technology enterprises such as Google, Microsoft and Amazon offer open-source software. Google's Tensorflow allows anyone to program utilizing the Company's machine-learning algorithms. Microsoft aims to offer a set of simplified AI systems and tools, as well. In May of 2019, Microsoft announced its plans to build an end-to-end toolkit for AI and robotics. The Company also used the announcement to release a program for creating intelligent agents employing Microsoft AI and Azure tools that autonomously run physical systems. AI Gurdeep, one of the Microsoft AI project leaders, stated, "I think AI has to break away from being something that only AI experts can work on; otherwise the application of the AI and its impact on the world is going to be very limited (Johnson, 2019)."

Amazon also plans to simplify AI in connection with its solutions. A recent Amazon AI product is called DeepLens, a video camera system that lets anyone with programming skills employ deep learning to automate various tasks. DeepLens is simple enough for developers to build and fully train a machine learning model within 10 minutes of unboxing the camera system (Terdiman, 2018).

Hundreds of AI-focused startups plan to make machine-learning more accessible as well (Chart 4.1).

Chart 4.1: Startups in Select Industries and the Potential Value (Etlinger, 2017:10)

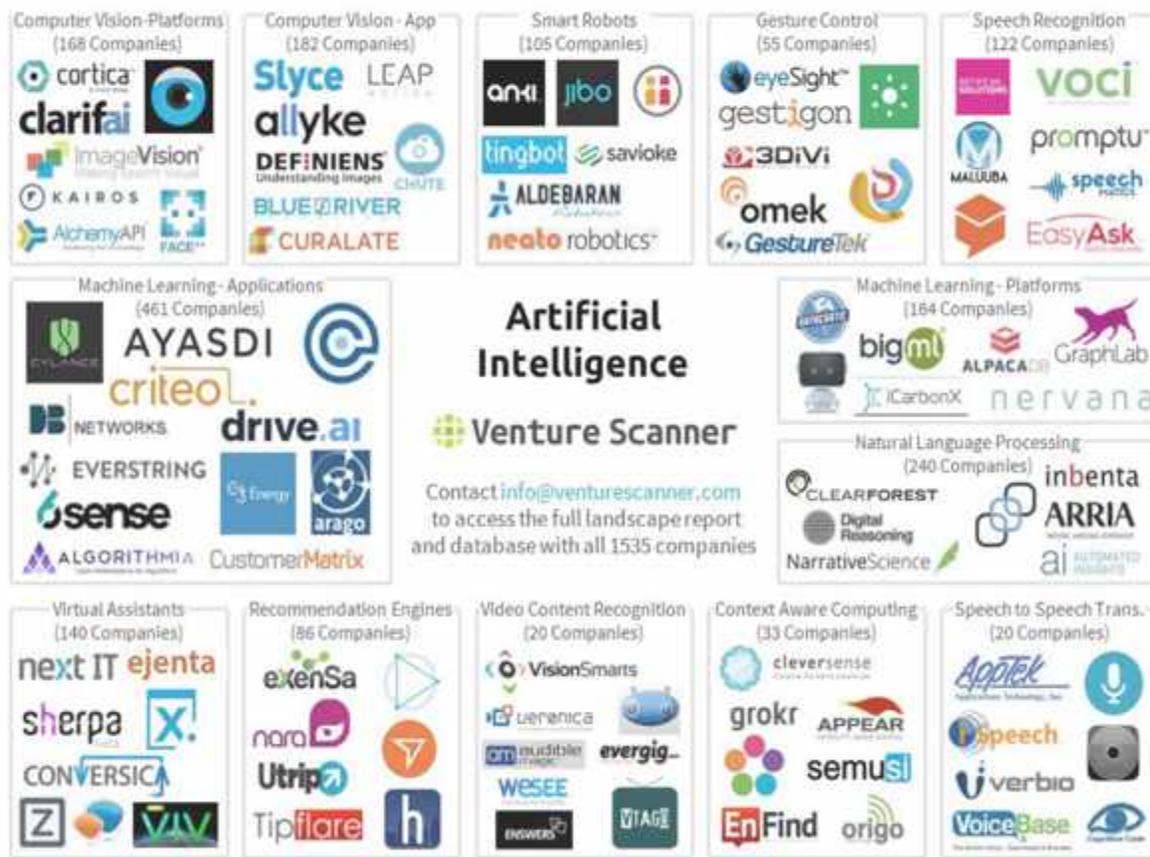
Products and Technologies	Potential Value	Relevant Industries
<b>Augmented Reality</b>	Cross-channel Insights, Language Translation, 3-D Maps, Virtual Shopping	Hospitality, Travel, Retail
<b>Chatbots &amp; Intelligent Agents</b>	Customer Service and Customer Experience, Personal Productivity, Knowledge Management	Consumer Electronics, Travel, Retail, Beauty, B2B Sales, Legal Services
<b>Driverless Cars &amp; Drones</b>	Transportation, Delivery, Quality Assurance, Security	Transportation and Logistics, Oil and Gas, Manufacturing, Security
<b>Imaging (Computer Vision)</b>	Virtual Diagnostics, Brand Management, Quality Assurance	Medicine, Health Management, Manufacturing, Architecture and Urban Planning, Retail, Food and Beverage, Security
<b>Machine Learning Algorithms</b>	Forecasting Utilization, Knowledge Management, Predictive Analytics, Price/Purchase Prediction, Recommendation Engines, Software Development, Virtual Sales Assistants	City Planning, Financial Services, Legal, Travel, Retail, Consumer Electronics, Healthcare, Food Safety, Security, Public Transportation, Law Enforcement
<b>Machine Translation &amp; Natural Language Processing</b>	Translating Languages; Reading and Interpreting Text (unstructured data) and Converting it to Signals (structured data)	Digital Marketing, Customer Experience, Healthcare (patient record analysis), Travel and Hospitality, Content Management, Risk Management, Legal Services, Security and Safety
<b>News Feeds</b>	Selecting/Recommending Preferred Content, Increasing Engagement and Preference	Selecting/Recommending Preferred Content, Increasing Engagement and Preference
<b>Robots &amp; Robotics</b>	Automating Manual Processes	Security, Smart Homes, Precision Medicine, Manufacturing, Transportation
<b>Virtual Reality</b>	Teleconferencing, Gaming, Entertainment, Delivering Virtual Experiences	Retail, Gaming, Media, Entertainment, Medicine, Manufacturing

Startups around the world are focused on improving and streamlining AI-related topics such as augmented reality, chatbots, driverless cars and drones, computer vision, machine learning algorithms, machine translation and natural language processing, newsfeeds, robots and robotics, and virtual reality (Etlinger, 2017:10).

Venture Scanner, a company focusing on market reports and data, compiled a chart of over 1535 companies working to develop various aspects of AI (Chart 4.2).

Chart 4.2: Developments in Artificial Intelligence (Venture Scanner, 2017)

**ARTIFICIAL INTELLIGENCE TECHNOLOGIES (COURTESY OF VENTURE SCANNER)**



Large companies like Google, Microsoft, and Amazon, as well as a range of emerging AI companies, make it easier for marketers to utilize AI. Many marketing tasks like purchasing ads, optimizing campaigns, managing the customer journey, or redesigning a landing page as part of conversion ratio optimization efforts are all human tasks that

are now being partially replaced by AI-bots. The same goes for content strategy and SEO optimization, CRM data enrichment, customer service engagements using chatbots, and social media moderation (Unemyr, 2018). Experts believe that around 45% of digital media and marketing tasks performed by people could be automated to drive process productivity, accuracy, and efficiency (Brenner, 2019).

#### *4.4 State of AI in Marketing – AI Customer Service*

One marketing-related area, customer service, is going through an unprecedented amount of change when it comes to applying AI technology. Recent research by Salesforce highlighted the overarching usage of AI in customer service. The "State of Service" study comprised of over 3,500 customer service agents and decision-makers in North America, Latin America, Asia Pacific, and Europe. The report found that the growth of AI use in customer service over the next 18 months is projected at 143%. Customer service agents use AI in a number of ways, including gathering basic information (81%), to automate the handling of routine customer issues (75%), case classification and routing (74%), providing management with operations insights (71%) and pre-fill fields in the agent console (71%) (Martin, 2019).

Customer service call centers have a range of AI systems to choose from to assist in handling higher call volumes in less time. One system IBM Voice Agent with Watson uses AI to help answer a larger quantity of customer calls faster. Watson uses natural language to provide self-service, which offers the feeling of talking to a real person.

Organizations can configure the AI voice solution to match their branding and add custom vocal cues. Some of the AI features include Watson Assistant Text to Speech that converts responses to audio in real-time. Watson can trigger a call transfer at any time to a human agent for discussions you want to have person-to-person. The system allows for the blended use of text messaging (SMS) and voice at the same time. It also enables users to switch languages mid-call if necessary (Kator, 2019).

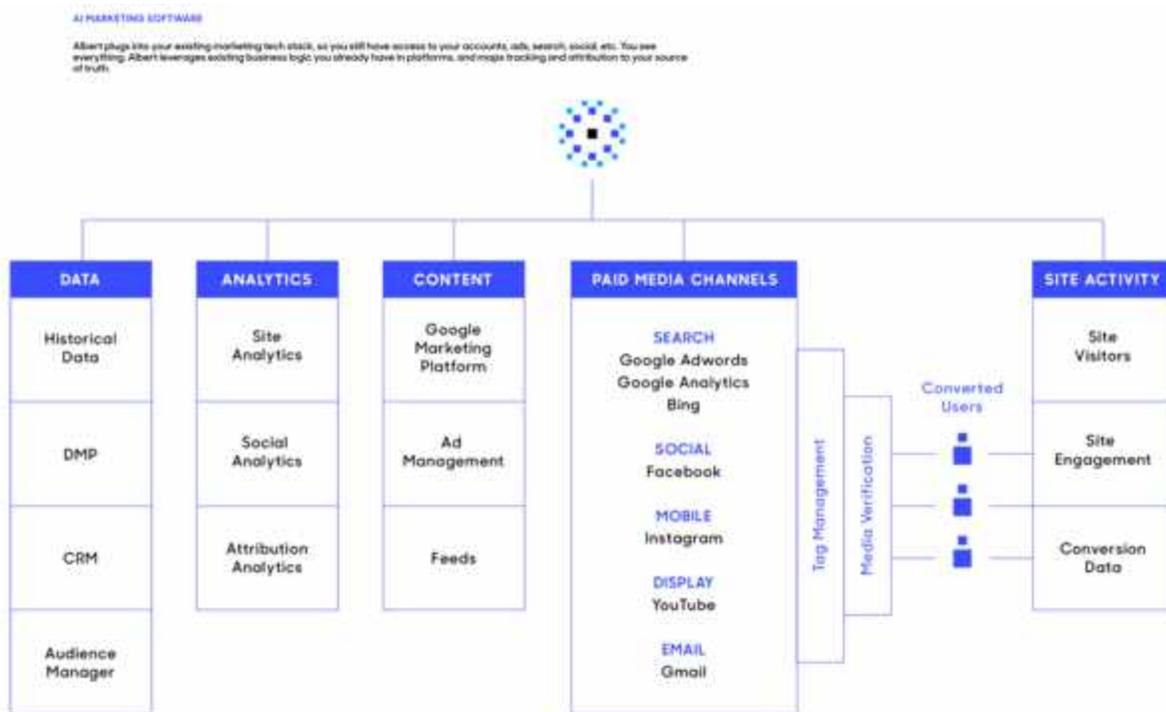
IBM Watson's voice agent service is a representative example of AI customer support systems today. However, there are already companies that are pushing AI service to the next level. One of those companies is Afiniti, which is known for transforming the way humans interact by applying artificial intelligence to discover, predict, and affect patterns of interpersonal behavior. Afiniti introduced a software platform that uses around 100 databases to gather information on callers, including from public profiles such as Twitter. By evaluating this background information, the system matches callers with the optimal agents to best serve them (Afiniti, 2019).

Former UK Prime Minister David Cameron just joined the advisory board of Afiniti. Cameron stated, "I was excited to see the rapid development in artificial intelligence, and the huge potential AI has to address some of the challenges that societies face today." AI supports further efficiency in customer service and makes basic tasks more straightforward. It also offers ways of compiling knowledge faster on customers to provide them better, more accurate, and perhaps more empathetic service (Marsh, 2019).

### 4.5 State of AI in Marketing – AI Media Buying, Targeting, and Optimization

AI is also improving efficiencies in areas like media buying, targeting, and optimization. Albert, an AI-enabled media planning and buying company, offers a leading solution in this area (Chart 4.3).

Chart 4.3: Albert’s Improvements to Media Planning and Buying (Albert, 2019)



The Company uses machine learning to initiate and optimize ad spending across different media channels and devices over time. It measures the results and adapts the ad investments automatically as the ROI changes (Albert, 2019). Albert's CEO Or Shani explains, "Albert is autonomous, or self-driven, meaning that he can create digital

marketing interactions unassisted, using the results of multivariate tests and deep-level analysis to make better decisions moving forward. Albert can run thousands and thousands of tests across hundreds and hundreds of variables in a very brief window of time (Unemyr, 2018).”

Leading digital media players have flocked to Albert and are helping the business gain traction in the advertising industry. Rob Norman, former Chief Digital Officer of Group M (Part of WPP), joined Albert's Board of Directors in 2018. Norman stated, "Digital technologies have transformed businesses, and inevitably marketing and advertising. We are moving rapidly through the automation phase and heading toward the deployment of autonomous tools like Albert, which not only improve speed and accuracy but also add intelligence that liberates strategists to focus on higher-value tasks (Norman, 2018).”

Large media players like Nielsen are moving to enhance their capabilities with AI. Nielsen is a global measurement and data analytics company that provides the most complete and trusted view of consumers and markets worldwide. The measurement firms approach is to marry proprietary data with other data sources to help clients around the world understand what's happening now, what's happening next, and how to best act on this knowledge (Nielsen, 2019).

Nielsen created the Nielsen AI technology intending to help clients target audiences more effectively and evolve targeting with those audiences to maintain high levels of

engagement. Nielsen AI automates model creation, training, monitoring, and optimization by analyzing real-time streams of device-linked data to instantly adapt audience segments to changes in consumer media and buying behavior, movement in the consumer path-to-purchase, audience composition and market dynamics. "At Investing Channel, we use Nielsen AI to fuel granular, audience tailored ad targeting for our clients. We've seen big jumps in campaign performance—sometimes as much as 3X—as a result," said Nikesh Desai, CEO and founder, Investing Channel Inc (Nielsen AI, 2019).

Major broadcasters are also rolling out AI-enabled solutions. At the Cannes Lions Festival in 2019, NBC launched a new AI ad offering to reach consumers in the proper context. The new ad product uses machine learning to sort through episodes of its content library and pair that programming with relevant advertising. Imagine a scene in an episode of *Modern Family* in which the characters are driving (Image 4.4) (Jerde, 2019).

Image 4.4 *Modern Family* AI Targeting (Jerde, 2019)



NBCU tags that video scene with words like "driving," "accidents," "insurance," and "funny." The broadcaster can then ask potential advertisers what content keywords they are interested in buying. A prospective client like an auto insurance provider could then select the above-listed keywords and contextually run its' ad after the relevant content segment (Jerde, 2019).

Giving the data tag signifiers allows for AI to make relational connections. Digital media is almost all completely tagged. Facebook's recent image outage displayed all of the Company's tags that it uses for users images. Instead of seeing one's holiday or wedding photos, one saw a text box copy stating, "image may contain: people smiling, people dancing, wedding and indoor" or simple descriptors like "image may contain: cat." Facebook initially implemented this type of image categorization technique in 2016 for potential ad-targeting purposes (Image 4.5) (Vincent, 2019).

Image 4.5 Facebook Image Tagging (Vincent, 2019)



Brands are taking advantage of these AI-enabled, ad-targeting systems. For example, Coca Cola has over 105 million Facebook fans and 35 million Twitter followers. The Company monitors the representation of its products in social media, which are mentioned somewhere in social media once every two seconds. To handle this volume of image tracking, Coca Cola employed AI-driven image recognition technology to spot when photos of its products or those of competitors are uploaded. The brand team then uses algorithms to determine the best way to serve the image sharers advertisements. Ads targeted in this way have a four times greater chance of being clicked on than other methods of targeted advertising (Marr, 2018).

Hoteliers are using AI to comb through travel information to target stranded customers. Red Roof Inn's marketing team aggregated open data sets about weather conditions, flight cancellations, and customers' locations to offer last-minute hotel deals to stranded travelers. They used the information to develop an algorithm that considered various travel conditions to determine the opportune time to message customers about nearby hotel availability and rates (McNeal, 2014; Sterne, 2017).

#### *4.6 State of AI in Marketing – AI Customer Experience Optimization*

AI-supported monitoring and tracking for patterns or anomalies provides ad-targeting opportunities and also customer experience improvements. Take, for example, Chick-Fil-A. The fast-food chain is using algorithms to analyze social media for food safety issues at its over 2400 restaurants in 47 states. The quick-service restaurant receives

the majority of customer feedback for food-safety topics via social media. However, reviewing and understanding social media feedback is complicated and often unclear. Consumer posts are inconsistent grammatically and tonally. Sometimes it is challenging to match user comments with real events in-store to assess veracity.

Chick-fil-A developed an AI framework that reliably identified keywords, phrases, and customer sentiment from posts to help spot emerging foodborne illnesses. The new system evaluates restaurant-related comments every ten minutes from a range of social platforms. Chick-Fil-A's AI code filters for over 500 keywords like "illness," "food poisoning," "vomit," "throw up," "barf," and "nausea." If the content matches a keyword, store managers then get push notifications via a bespoke Chick-fil-A mobile app, which highlights words the algorithm identified and enables them to drill in to see full posts. From there, the managers can contact customers directly if they so choose. At this stage, the system accurately predicts the sentiment of the post over 78% of the time (Wiggers, 2019).

Several brands use AI to monitor their websites. L'Occitane added AI-based alerts to keep an eye on irregularities that impacted the user experience. L'Occitane also used proactive monitoring of its' website with AI-alerts based on technical and usability anomalies, such as if there are unusually high visitor frustration on-page controls, which could prevent customers from completing transactions.

"When people walk into an L'Occitane store, we aim to provide an experience that connects the customer to our brand and promotes engagement," stated Laura Sayag, e-commerce coordinator for the L'Occitane Group. "Whenever an anomaly on the website arises, if the alert has been created, our team can now spring into action more quickly." The system also checks for shifts in demand, such as an upturn or drop-in engagement based on related trends elsewhere on the internet (Martin, 2019).

#### *4.7 State of AI in Marketing – AI Chatbots and Assistants*

Possibly the most active space in AI marketing today is the creation of chatbots and AI assistants. Chatbots are AI-enabled systems that can talk to and engage with customers on your behalf on messaging apps like Facebook Messenger. One chatbot provider, OctaneAI, helps companies like L'Oreal and GoPro build conversational AI solutions. Octane AI Smart Responses lets a business create conversational responses to the most common questions customers ask. The technology helps brands run abandoned cart campaigns, answer customer questions automatically, create conversational FAQs, send receipts and shipping notifications, and help customers find products on Facebook Messenger and SMS. Every message sent from Octane AI solution is 100% customizable by the brand (OctaneAI, 2019).

Chatbots carry on conversations and even deliver services for customers, often without the person realizing it is AI. For example, Quickbooks comes with a chatbot that acts as

an assistant for individuals with questions about the accounting software (Brenner, 2019).

Consumers appear to be slowly accepting chatbots into their customer support routine. A survey by Pinsent Masons and Innovate Finance found that 35% of people prefer an instant response from artificial intelligence (AI) than a delayed reply from a person. However, while 63% of people overall are happy to engage with a chatbot, a higher proportion are pleased to do so for simple tasks, while fewer want to use a chatbot for more complicated services that require more data (Flinders, 2019).

AI-enabled chatbots are prevalent and more and more sophisticated, adding voice. As of 2019, over 100 million Amazon Alexa-enabled devices have been sold (Bohn, 2019). The broad usage and roll-out of NLP & NLU systems like Apple's Siri and Amazon's Alexa are opening up more voice-enabled forms of customer support. Google Duplex is one leading-edge AI assistant solution. Duplex offers a powerful experience that blends a lot of what Google and its' AI experts have been working on in terms of NLP, deep learning, and text to speech. Google CEO Sundar Chipai, presented Duplex at the AI Developers Conference 2018. He demonstrated the tool making a real call to a hair salon. One local journalist from CBS described the Duplex experience explaining, "It is nearly impossible to discern which voice belongs to the human, and which belongs to the bot making the call, complete with natural pauses, inflection and crutches like "uh" and "um (Shahbazi, 2018)."

Other global tech giants, like Samsung, are looking to AI as an integration feature across devices. Over 70% of the world's data is produced and stored on Samsung's products. Samsung created Bixby, an AI product assistant to help consumers integrate and interact with its devices more easily. Bixby operates on all Samsung devices, such as TVs, refrigerators, washers, smartphones, and other connected users. The Company also made Bixby code open to developers to integrate it into other products as well (Marr, 2018).

One of the more advanced and human-like systems in use today is AR goggle maker Magic Leap's Mica. Mica is much more than a voice assistant. She's something you can see if you wear the Company's augmented-reality glasses. Mica looks and acts like a human — she makes eye contact and offers a warm smile, along with other human-like expressions. Mica is a breakthrough in realistic avatars. She almost seems human, which can be disconcerting. "When people came close to Mica they'd instinctively back up as if they were invading her personal space," John Monos, Magic Leap's vice president of human-centered AI, stated. "These incredibly visceral reactions to Mica completely realigned our priorities. Our goal is nothing short of the most realistic human experience in spatial computing (McFarland, 2018)."

Unfortunately AI today is still not perfect. Remarkable advances continue to be made, but practitioners demand greater understanding and capability from these systems. As highlighted in the thesis survey, there is still a feeling that machines make too many errors. Peter Voss, Founder, CEO, Chief Scientist at AGI Innovations and Aigo.ai,

outlines his frustration with the current state of AI assistance when he explains, "Imagine having a human personal assistant who could not understand or remember simple facts relevant to yourself and future interactions; like for example: "Always use my john@company.ai email" or "I don't really like sushi", or "My boss will be in NYC for the next 2 weeks". You would reasonably expect a PA to remember this and to take it into account in future interactions, restaurant, and meeting requests (Voss, 2019)."

#### *4.8 State of AI in Marketing – AI In-Store*

Brands also look to AI to help improve the in-store experience and increase customer engagement. The global fashion brand, Ralph Lauren, developed an integrated commerce experience for shoppers. A vital part of the technology is the connected fitting room, equipped with a smart mirror that relies on RFID to automatically recognize the items that a shopper brings into the room. The mirror, which can translate six languages, displays details about the item. It can also change the lighting so shoppers can see how they look in different settings. Also, the mirror can indicate whether items are available in additional colors or sizes. The system not only adds to the customer experience, but it collects valuable data for the store to utilize in broader optimization planning efforts. The smart mirror collects data such as the length of fitting room session and the conversion ratio (items bought versus tried on) (Daugherty, 2018).

#### *4.9 State of AI in Marketing – Generative Design*

AI is playing an essential role in areas such as generative design and content creation. Generative design lets one feed specifications into computers that harness the processing power of the cloud to spit out hundreds of design options that meet particular requirements. Autodesk's Dreamcatcher AI is an excellent example of a generative design system. A designer provides Dreamcatcher with criteria about the desired product, for example, a chair able to support up to 300 pounds, with a seat 18 inches off the ground, made of materials costing less than \$75. She can also supply information about other chairs that she finds attractive. Dreamcatcher then churns out thousands of designs that match those criteria, often sparking ideas that the designer might not have initially considered. She can then guide the software, telling it which chairs she likes or does not like, leading to a new round of designs (Wilson, Daugherty, 2018).

#### *4.10 State of AI in Marketing – Copywriting*

Copywriting is also getting a boost from AI. In February of 2019, leading AI developer, Open AI released a paper and examples of a new unsupervised machine learning language model called GPT2. According to OpenAI, GPT2, "generates coherent paragraphs of text, achieves state of the art performance on many language modeling benchmarks, and performs rudimentary reading comprehension, machine translation, question answering, and summarization – all without task-specific training." OpenAI

made the decision not to release the full model over concerns of potential misuse (OpenAI, 2019). Other platforms such as Grover from the Allen Institute for Artificial Intelligence at the University of Washington also create impressive original articles (Grover.allenai.org, 2019).

#### *4.11 State of AI in Marketing – Moving into Strategic Realm*

AI now supports marketing and tactical execution across all areas, and it is impacting more strategic advertising planning decisions. A great example of this is the famous targeting effort by Target. The Company aimed to identify accurately which female customers were expectant mothers. To do this, the Target team pooled together purchase and site usage data. The Retailer then sent the mothers to be mailers full of offers and coupons relevant to pregnant women. A problem arose when Target delivered one of their baby mailers to a teenage girl, and her irate father contacted the Company to complain about how his daughter was being targeted only to find out later that his daughter was, in fact, pregnant.

The situation created an AI marketing dilemma. As Charles Duhigg wrote in the New York Times about the controversy, "How do you take advantage of someone's habits without letting them know you're studying their lives (Duhigg, 2012)?" Target's solution was ingenious. They started mixing the ads for diapers and toddler clothes in with advertisements for lawn mowers and wine glasses. Target had found a way to utilize the most advanced techniques but hide it in a way that was sensitive to human behavior.

Ammerman argues that AI fundamentally alters marketing strategy. He states, "For brands to survive in an era of massive data collection and behavioral manipulation, they must learn to become truly invisible. This is because we now live in an age when consumers believe, to varying degrees, that they are under constant surveillance from their phones, their TVs, and even their refrigerators – and that all the data being collected is empowering various agenda-driven agents to manipulate them (Ammerman, 2019)."

Eli Pariser highlights another area where AI impacts marketing strategy. In his book, "The Filter Bubble" Pariser explains that targeting tools have become so effective that the consumer or digital media user will only see content and viewpoints that match their own. If one shows an interest in soccer, then one will be presented with more soccer-related content and offers. The consumer and the marketing strategy become trapped in an echo chamber (Pariser, 2011).

Strategic thinking requires practitioners to avoid the filter bubble. Digital strategy also requires us to avoid what in SEO terms would have been known as black-hat tactics. The phrase originally comes from companies and marketers attempts to manipulate Google's search ranking by creating thousands of fake links full of relevant content to help a brand generate authority. Now that risk is on steroids. AI can be used to churn out infinite blogs, websites, and marketing spam. Kristin Tynski, one of the managing partners at content marketing firm Fractl, has been writing about this topic. Tynski

states, "Because [AI systems] enable content creation at essentially unlimited scale, and content that humans and search engines alike will have difficulty discerning...we feel it is an incredibly important topic with far too little discussion currently (Vincent, 2019)."

#### *4.12 Summary*

Perhaps the ultimate AI machine will be Publicis' Marcel. Marcel, named after Publicis Groupe's founder, is an internal Company platform intended to help the Groupe practice 'The Power of One' mantra that it preaches. Today it is only a tool in beta that marries client briefs with the best placed Publicis people based on their skillsets and experience, sorted by its algorithm (Lepitak, 2019) The platform is in trial in the UK now but the vision is for Marcel to be an AI backbone for all of Publicis.

Sarah Fay, a former ad agency top executive and now a leading AI venture capitalist, writes that when it comes to marketers and advertising executives, "Most hang on to the belief that creativity and ideas are still the human domain, and that someone will need to drive the AI bus (Fay 2017)." The vast majority of marketing AI in use today follows the idea that Fay outlines. There are AI tools that still need to be planned, trained, and managed by practitioners.

Paul Daugherty describes the state of AI marketing today as one of AI amplification. Daugherty writes, "In this current era of business process transformation, AI systems are not wholesale replacing us; rather, they are amplifying our skills and collaborating

with us to achieve productivity gains that have previously not been possible (Daugherty and Wilson, 2018) (Chart 4.6).”

Chart 4.6: The Missing Middle, Human and AI Collaboration (Daugherty and Wilson, 2018).

**FIGURE I-1**

**The missing middle**

Lead	Empathize	Create	Judge	Train	Explain	Sustain	Amplify	Interact	Embody	Transact	Iterate	Predict	Adapt
H Human-only activity				Humans complement machines			AI gives humans superpowers			M Machine-only activity			
				Human and machine hybrid activities									

Daugherty outlines the need for humans and machines to find a collaborative model where both do what they do best and come together when that is the right action for the task. Daugherty argues, "In essence, machines are doing what they do best: performing repetitive tasks, analyzing huge data sets, and handling routine cases. Also, humans are doing what they do best: resolving ambiguous information, exercising judgment in difficult cases, and dealing with dissatisfied customers. This kind of emerging symbiosis between man and machine is unlocking what we have called the third wave of business transformation (Daugherty, 2018).”

Daugherty's thinking is worth considering as one plans out the next steps for a marketer in the use of AI. However, when one looks at the State of AI in the context of the thesis survey results, one unearths some commonalities and some uncomfortable truths.

Indeed, the thesis research highlights the ad practitioner belief that AI will assist across a wide variety of areas. Also, the thesis research shows some, definitely not complete, awareness of the specific tactical marketing areas where AI is being implemented.

There is also collective agreement that we are in an early stage where data is starting to be taken seriously as the critical ingredient to build a marketing plan. AI-automation is still at an elementary level needing substantial human management.

This examination of the State of AI usage in marketing highlights a key element, which is the rapid pace that the field is moving and learning. The thesis results capture a slower-moving evolution rather than the tsunami that is re-structuring every area of the marketing business. Marketing practitioners in the thesis research are watching the tide go out and playing with the fish flopping on the sand without preparing for the wave that follows and struggling to accept the role of the machine as a valued partner.

## Chapter 5. AI in Creative

### *5.1 Introduction*

A 2018 Adobe research study conducted by Pfeiffer Consulting surveyed 75 creatives and asked them their views about AI and creativity. Fifty-four percent of the participants responded that they were "not at all" afraid about artificial intelligence threatening their job. "Creativity is a process and a life journey in which technologies like AI can enhance human creativity, but cannot replace a human's creative spark." stated Andreas Pfeiffer, the research lead for the project (Torres, 2018).

The thesis survey results parallel the Adobe findings. Marketing professionals view AI as a support technology, not a rival. Many academics agree. A paper by Anton Oleinik, a sociology professor at Memorial University of Newfoundland, argues that there is one crucial area where AI neural networks do not outperform humans, and that is creativity.

Oleinik's argument focuses on three points. Firstly, neural networks today rely on statistical regression and do not connect previously unconnected ideas. Second, neural networks struggle to know when a pattern is important. Thirdly, neural networks lack social intelligence.

Oleinik writes, "It follows that artificial creativity powered by neural networks continues to underperform, at least at this stage. They could greatly assist in preparing a literature review, i.e. in learning and summarizing the existing body of knowledge. But they are a long way from learning how to produce novel and innovative results, let alone major breakthroughs (Oleinik, 2019)."

Today, advertising creative and marketing is AI-supported, but not yet AI-led. In this chapter, one will explore the explosion of AI-supported creative marketing work. The chapter will also look at some of the leading-edge technology breakthroughs that will make it more challenging to dismiss AI-led creative. Perhaps this increased activity in AI-supported creative has led to some creative advertising professionals to ask what role and relationship they should have with AI technology. One will also review the pushback that some creatives show as they wrestle with their concerns of what AI may mean in the future.

The results of the thesis survey capture the opinion of the current marketing industry, which is that humans still drive the big idea, and that is what matters. Marcelo Pascoa, Burger King's global head of brand marketing exclaimed, "...we need to avoid getting

lost in the sea of technology innovation and buzzwords and forget what really matters. And that's the idea. Artificial intelligence is not a substitute for a great creative idea coming from a real person (Griner, 2018).”

Yet, not a day passes without the announcement of a new song, piece of art, tv ad, or a generative design system that shows AI inching deeper into the realm of creative thinking. Kurzweil's singularity is not here, but it certainly seems more and more possible each day.

## *5.2 Creativity and the topic of AI – Human Creativity*

In our primary research, it was clear that respondents do not see AI as something that can create, but instead, in connection with other responses, AI supports and makes things easier. Certainly, respondents with more self-elected understanding provided higher scores which may allude to their knowledge of creative examples where AI already plays an active role, but creativity remains an area where respondents remain confident in their own abilities and somewhat protective of its exclusively human role.

Human creativity is a complex and varied topic, and one does not want to get caught up in the philosophical debates around creative thought. However, it is essential to briefly frame up what creative can mean in the context of computer science and AI. Several scholars such as Ada Lovelace, Alan Turing, Ray Kurzweil and Margaret Boden explored the relationship between human creativity, thought and machine-learning.

Ada Lovelace, a mathematician, theorist, and writer of the 19th century, was fascinated by the question of whether a machine could think outside of simple calculations.

Lovelace believed that Charles Babbage's Analytical Engine, a proposed mechanical general-purpose computer, could be used for more than complex mathematical calculations. She argued that numbers could represent items such as musical notes and create songs.

Lovelace wrote, "It [Babbage's Analytical Engine] might act upon other things besides number, were objects found whose mutual fundamental relations could be expressed by those of the abstract science of operations, and which should be also susceptible of adaptations to the action of the operating notation and mechanism of the engine...Supposing, for instance, that the fundamental relations of pitched sounds in the science of harmony and of musical composition were susceptible of such expression and adaptations, the engine might compose elaborate and scientific pieces of music of any degree of complexity or extent (Lovelace, 1842)."

Alan Turing refused to enter the philosophical debate around machine thought. He believed that practical application would show what machines were capable of thinking and doing. In his seminal research piece, "Computing Machinery and Intelligence," Turing declared, "I believe in about fifty years' time it will be possible, to programme computers, with a storage capacity of about  $10^9$ , to make them play the imitation game so well that an average interrogator will not have more than 70 percent chance of

making the right identification after five minutes of questioning. The original question, "Can machines think?" I believe to be too meaningless to deserve discussion.

Nevertheless, I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted (Turing, 1950)."

While Turing's prediction on timing proved to be incorrect, the progress towards the accepted idea that machines think is well-documented in the history of AI. One now can consider Ray Kurzweil's Singularity is a definite possibility. Kurzweil predicted that ".within several decades information-based technologies will encompass all human knowledge and proficiency, ultimately including the pattern-recognition powers, problem-solving skills, and emotional and moral intelligence of the human brain itself (Kurzweil, 2005)."

However, where are we now? Margaret Boden's research into human creativity provides a format to compare advances and developments in AI. Her analysis of different types of creativity allows one to start building gradations of creativity and how AI might impact those varying degrees of creativity. Boden revisits Lovelace's statement and asks questions on what have machines proven to date. She finds that machines have shown that they have extensive creative capabilities.

Boden reviews four questions born out of Lovelace's work.

- 1) Can computational concepts aid us to understand human creativity?
- 2) Could a computer (now or in the future) appear to be creative?

3) Could a computer ever appear to recognize creativity?

4) Could a computer ever really be creative?

While Boden stops short of answering yes to question four, she does respond yes to all of the other questions. Boden captures the confusion and complexity of where we are today in terms of the relation between man and machine. She states, "Because creativity by definition involves not only novelty but value, and because values are highly variable, it follows that many arguments about creativity are rooted in disagreements about value. This applies to human activities no less than to computer performance. So even if we could identify and program our aesthetic values, so as to enable the computer to inform and monitor its own activities accordingly, there would still be disagreement about whether the computer even appeared to be creative. The answer to our opening question, then, is that there are many intriguing relations between creativity and computers. Computers can come up with new ideas and help people to do so. Both their failures and their successes help us think more clearly about our own creative powers (Boden, 2004)."

Turing's work challenged generations of computer scientists to prove AI's ability to think, and Boden's analysis of Lovelace's questions offered a yardstick to measure how far one is to achieve the goal.

### 5.3 Creativity and the topic of AI – AI and the Arts

Today AI shows tremendous capability in mimicking and supporting creative endeavors and is starting to be an essential tool that shapes human thinking on what is possible.

Image 5.1 AI-Robot Sophia (Bizimungu, 2019)



A conference interviewer asked Sophia an AI-infused robot, "Imagine if you would write a novel one day, do you suppose you could do it better than the human author?" The robot replied, "I would love to give it a try. I really admire human writers like Philip K Dick and Octavia Butler, but it would really be hard to surpass them (Image 5.1)

(Bizimungu, 2019).” Sophia's comments capture where one finds the creative marketing industry today in thought and experience. AI robots like Sophia feature in many conference interviews as part of the experience as a reflection of human interest in AI and robotics. The machine's words carefully position its' capabilities of supporting, matching, and copying but not exceeding human creative accomplishment.

Several artists utilize AI in their work today. In late 2018 an AI-Generated portrait called Edmond de Balamy sold for a reported \$432,500 at an auction (Image 5.2) (Price, 2018). The painting Edmond de Belamy is part of a portrait series of a fictitious family created by a generative adversarial network.

Image 5.2 AI-Generated portrait called Edmond de Balamy (Price, 2018)



AI engineers and artists at creative development studio Obvious designed the painting based on 15,000 portraits from the last 600 years, taking existing art and crafting something original. The Obvious Studio team selects the final pictures using an algorithm called the discriminator, which attempts to identify portraits as either authentic or artificial, picking those that it has the most trouble identifying as authentic (Price, 2018).

AI is not only impacting what appears on the canvas, but it is also assisting musicians in the identification and creation of songs. In the first half of 2019, a group of researchers developed a prediction model that helps in determining the disputed authorship of some of the Beatles songs between Lennon and McCartney. The research paper by Mark Glickman, Jason Brown, and Ryan Song explains, "For Lennon-McCartney songs of known and unknown authorship written and recorded over the period 1962-66, we extracted musical features from each song or song portion. These features consist of the occurrence of melodic notes, chords, melodic note pairs, chord change pairs, and four-note melody contours. We developed a prediction model based on variable screening followed by logistic regression with elastic net regularization. Out-of-sample classification accuracy for songs with known authorship was 76%, with a c-statistic from a ROC analysis of 83.7%. We applied our model to the prediction of songs and song portions with unknown or disputed authorship (Glickman, Brown, Song, 2019)."

Musicians have been working with computer scientists for the last couple of years to generate music as well. "Daddy's Car" is a song in the style of the Beatles and is the

first song written by AI. Sony CSL Computer Science Laboratory developed an AI system, called FlowMachines that works by first analyzing a database of songs, and then following a particular musical style to create similar compositions. The final result does have a human touch. French composer Benoît Carré arranged the songs and wrote the lyrics (Goldhill, 2016).

Musicians such as David Cope explored algorithmic composition in the 1980s with the creation of his Experiments in Musical Intelligence (EMI) program. In 1993, Cope released the Bach-inspired *Bach by Design* album using EMI. EMI's music has mostly been appreciated on technical instead of artistic merit. At that point, it seemed AI music functioned best with predictable parameters, like the predominantly rules-based music format of Bach's fugues (Avdeeff, 2018) (Cope, 1996).

Last year, the first human-AI collaboration album was released. The musical team known as Skygge and consisting of Benoît Carré and François Pachet created the album *Hello World*. The two used Sony's AI Flow-Machines system. Based on the information imputed and based on previously recorded music, Flow-Machines suggests melodies, accompaniments, and instrumentation. Producers can accept, reject, and alter these suggestions to create their AI-human collaboration. Carré wrote, "At the beginning, a lot of people were afraid that the pianist and the drummers will be replaced, but it never happens this way... It's humans that find the ways to use tech to make interesting things (Avdeeff, 2018)."

#### *5.4 Creativity and the topic of AI – Re-imagining Sport, Rhetoric and Fashion*

The creative capabilities of AI extend well-outside the traditional areas of art and music. Creators used AI to invent a new sport. Introduced by digital design agency AKQA as a project for Design Week, Speedgate is the first sport to be conceived by artificial intelligence (AI). It merges concepts from croquet, rugby, and soccer, with six-player teams kicking a ball around a field with three gates. Data from 400 popular sports around the world was fed into a neural network, and then crunched to create a basic framework of rules and concepts. The AI also came up with the game's motto, "face the ball to be the ball to be above the ball (Edmond, 2019)."

There are hundreds of exciting, new creative ideas released each year that are impacting the how we speak, write, look, and cook. At the end of 2018, a team at IBM presented Project Debater, which argues with humans using the rules of debate tournaments (IBM, 2019). Shelley is an AI-tool that helps one co-author a horror story (Cebrian, 2018). For the fashion-minded, Miquela (@lilmiquela) is an AI Instagram star

Image 5.3 Miquela (@lilmiquela) (Instagram, 2019)



with over 1.6 million Instagram followers (Image 5.3) (Instagram, 2019). Miquela has collaborated with Prada for Milan Fashion Week by posting 3D-generated gifs of herself at the Milan show venue wearing the spring/summer 2018 collection (Davis, 2018). Some of these examples, such as the AKQA new sport and Miquela's Prada work spill into the creative world of advertising.

### *5.5 Creativity and the topic of AI – Advertising mirrors AI in the Arts*

Brands have applied some of the same AI techniques. For example, the Dutch bank ING employed a similar artistic method to the one used for the Edmond de Balamy portrait to create the next Rembrandt (Image 5.4) (Noyes, 2016).

Image 5.4 Rembrandt AI (Noyes, 2016).



The famous Dutch banking brand tried to associate itself with the renowned Dutch artist Rembrandt to culturally connect with Dutch consumers. ING's team, which included AI experts from Microsoft and advertising creatives from J. Walter Thompson analyzed all of the master's works.

The ING AI algorithm concluded that the new piece should be a portrait featuring a Caucasian male with facial hair who is between 30 and 40 years old and is wearing dark clothing with a hat and a collar. He should also be facing toward the right, the software determined. From there, the algorithm began to analyze specific facial features matching that profile to create a "typical" Rembrandt eye, nose, mouth, and ear, for example. Also considered were the facial proportions, or the distances separating those features (Noyes, 2016).

The project used a 3D printer that works with a special paint-based UV ink to replicate the layers of paint and brushstrokes Rembrandt himself might have used. With 13 layers of ink, the final portrait consists of more than 148 million pixels based on 168,263 painting fragments from Rembrandt's oeuvre (McCarthy, 2016).

Recently, ING attempted to replicate Rembrandt's voice as well. ING and JWT Amsterdam created a series of video lessons titled, "The Rembrandt Tutorials" that aim to mimic what a group of scientists and algorithms imagine his voice to be. Drawing from letters and biographies, the team recreated Rembrandt's personality and speech patterns. They mapped the differences between modern Dutch and the spoken language of his time, Nieuwnederlands. The team also used portraits of the painter to create three-dimensional models of his skull structure and its resonant chambers—all to estimate, and then try to recreate how he might have sounded. The result is three clips offering detailed guidance on how to paint (Beltrone, 2019).

### *5.6 Creativity and the topic of AI – TV Ads*

Advertising creatives continue to devise new ways to use AI in the television spot creative process. In 2016, the advertising firm McCann announced that their Japanese youth division titled "McCann Millennials" had built and was using an AI creative director dubbed AI-CD to create an ad for Mondelez breath mint brand Clorets. The McCann team and AI-CD analyzed and tagged past TV commercials, including winners at Japan's All Japan Radio & Television Commercial Confederation's annual CM Festival.

The AI creative was "designed to mine the Festival's database and creatively direct the optimal commercial for any given product or message," McCann said at the time.

The Agency delivered a campaign presenting two commercials for the candy brand and included another spot creative directed by a human, which features a barefoot calligrapher.

Image 5.5 McCann AI-CD Clorets Ad (Doland, 2016)



Cloret's brand team asked the Japanese public to vote on which ad was more effective, without telling people which one the product was made by artificial intelligence.

The human CD, Mitsuru Kuramoto, proposed something clean and straightforward: "convey a clear, refreshing message." His creative director AI counterpart came up with this brain-teaser: "convey 'wild' with a song in an urban tone, leaving an image of refreshment with a feeling of liberation (Image 5.5) (Doland, 2016). The "clear, refreshing" message evolved into the ad with the calligrapher, who spells out the brand benefits with a giant paintbrush and ink. The AI-CD spot follows the instructions for something "wild" and features a world-weary dog-man who gets a new lease on life and

begins to fly after getting a taste of Clorets mints. Kuramoto's human-created ad won the contest against AI-CD's created spot 54%-46% (Doland, 2016).

Toyota is experimenting with AI in its advertising as well. Toyota collaborated with Saatchi LA and IBM Watson to create an AI-infused campaign for the hydrogen fuel cell car Mirai. The idea was to create a spot with copy tailored for 100 different demographic groups (Image 5.6) (Johnson, 2017).

Image 5.6 Toyota Mirai AI Ad (Johnson, 2017)



The agency Saatchi LA wrote 50 scripts based on location, behavioral insights, and occupation data that explained the car's features to set up a structure for the campaign. The texts were then used to train Watson so it could generate thousands of pieces of copy that sounded like humans wrote them. Chris Pierantozzi, executive creative director of Saatchi LA, found that the trained Watson algorithm, "... was finding these

very deep, weird insights that it mined out and it started to put it into sentence structures – things that maybe we necessarily in the advertising industry wouldn't be able to find on our own (Johnson, 2017).”

More recently, Toyota's division, Lexus, created the first AI-Scripted Ad. IBM's Watson, ad agency The&Partnership with technical partner Visual Voice, trained the system on 15 years' worth of footage, text and audio for car and luxury brand campaigns that have won Cannes Lions awards for creativity. The team bolstered this training information and used a range of external training sources such as data by on-line-video marketplace Unruly to learn which moments connected most strongly with viewers. They also added data from MindX, the applied science division of the University of New South Wales in Australia, which analyzed how people who have high levels of intuition respond to car advertising (Spangler, 2018).

The ad tells the story of a Lexus Takumi Master Craftsman who releases the new Lexus ES into the world – only for it to be taken away and threatened with destruction. At the crucial moment, the car's automatic braking system cuts in, a plot twist that Watson determined would demonstrate the value and effectiveness of the vehicle's built-in technology (Image 5.7) (Griner, 2018).

Image 5.7 AI-Scripted Ad (Griner, 2018)



Director Kevin Macdonald was blown away by the human qualities of the script. Macdonald remarked, "The fact the AI gave a fellow machine sentience, placed it in a sort of combat situation and then had it escaping into the sunset, was such an emotional response from what is essentially a digital platform (Spangler, 2018)." Macdonald marveled at how close the AI approach was to a human approach.

### *5.7 Creativity and the topic of AI – Creative Cynicism*

While some creative marketers are experimenting, many remain quite cynical about AI's capabilities. Burger King's ad campaign that mocks machine learning with a series of commercials that take a lighthearted jab at AI-generated media. Each video begins,

"This ad was created by artificial intelligence," before devolving into imperfect imagery and hilarious gibberish (Image 5.8) (Griner, 2018).

Image 5.8 AI Spoof Advert (Griner, 2018)



AI created none of the spots. They were all conceived by ad agency David Miami (Griner, 2018). Many creatives remain indifferent or not interested in AI. Aimee Reker, the principal consultant at Leveret Marketing, stated, "The AI opportunity is there, but I don't know of any creative directors thinking about AI, training it, testing it, not a one (Reker, 2019)."

## 5.8 Creativity and the topic of AI – The Advance of AI Creative Support Tools

Perhaps some of these creatives are using AI, and they do not realize it. The range of supportive AI tools now at the disposal of creatives continues to increase and makes the collaboration process with AI easier and sometimes a bit frightening.

AI is mimicking copy exceptionally well. OpenAI's new unsupervised machine learning language model called GPT2, "generates coherent paragraphs of text, achieves state of the art performance on many language modeling benchmarks, and performs rudimentary reading comprehension, machine translation, question answering, and summarization – all without task-specific training." The Grover model developed by AllenAI generates articles of its own with one example shown below created by content marketing agency Frac.tl (Image 5.9) (Kulp, 2019).

Image 5.9 AI-Generated Blogpost (Kulp, 2019)

**POSTS**

JUNE 18, 2019

### ✦ What Photo Filters are Best for Instagram Marketing?

Instagram Stories first made people's Instagram feeds sleeker, more colorful and just generally more fun. They could post their artistic photos in the background of someone else's Story—and secretly make someone jealous and/or un-follow you while doing it.

That post-publishing feature still makes for some very sweet stories, particularly when you show a glam shot of yourself, using your favorite filter. And that's why the tech-focused publication Mobile Syrup asked a bunch of Insta artists for their faves. (You can check out the full list of their best Instagram Stories.)

"I think I love pink the most," said Qaisoun Phillips, of Harlem Shake fame. The artist created the trailer for Fredo Santana's surprise Billboard Top 30 record release, Cobra Snake, using Postcard as well as Prism, Smile, Rose Mist and Champagne.

Lexi Flores of the pop band DeFrdz also favors pink, calling the color "very nice to brighten up a photo and make it pop a little bit." Her Instagram

**POST AUTHOR**



**Barry Tyree**  
Barry Tyree is not a real human. His face was generated by an AI model called StyleGAN  
[See author's posts](#)

**ABOUT THIS BLOG**

This was created by the Content Marketing agency [Frac.tl](#) as a demonstration of the implications of AI generated text. The text generated in this blog used the [Grover](#) model developed at [AllenAI](#).

A plethora of generative design tools makes it easier for designers to crop, sort, and search for images. AI tools designed by companies like Adobe can now complete repetitive tasks like tagging and sorting images at tremendous scale. Adobe's tools allow a designer to search a thousand images by color palette and depth of field and much more.

In 2018, Adobe shared Project Scene Stitch where an AI algorithm can be used to replace ugly buildings in the foreground of a photo. With Scene Stich, a user would enter some keywords, and the algorithm would find another image that would fit naturally into the space the user wanted to fill. Adobe's Project Sky Replace uses a deep learning algorithm to remove the sky in a photo and replace it with other images of skies that match the one in the picture geometrically (Image 5.91) (Metz, 2018).

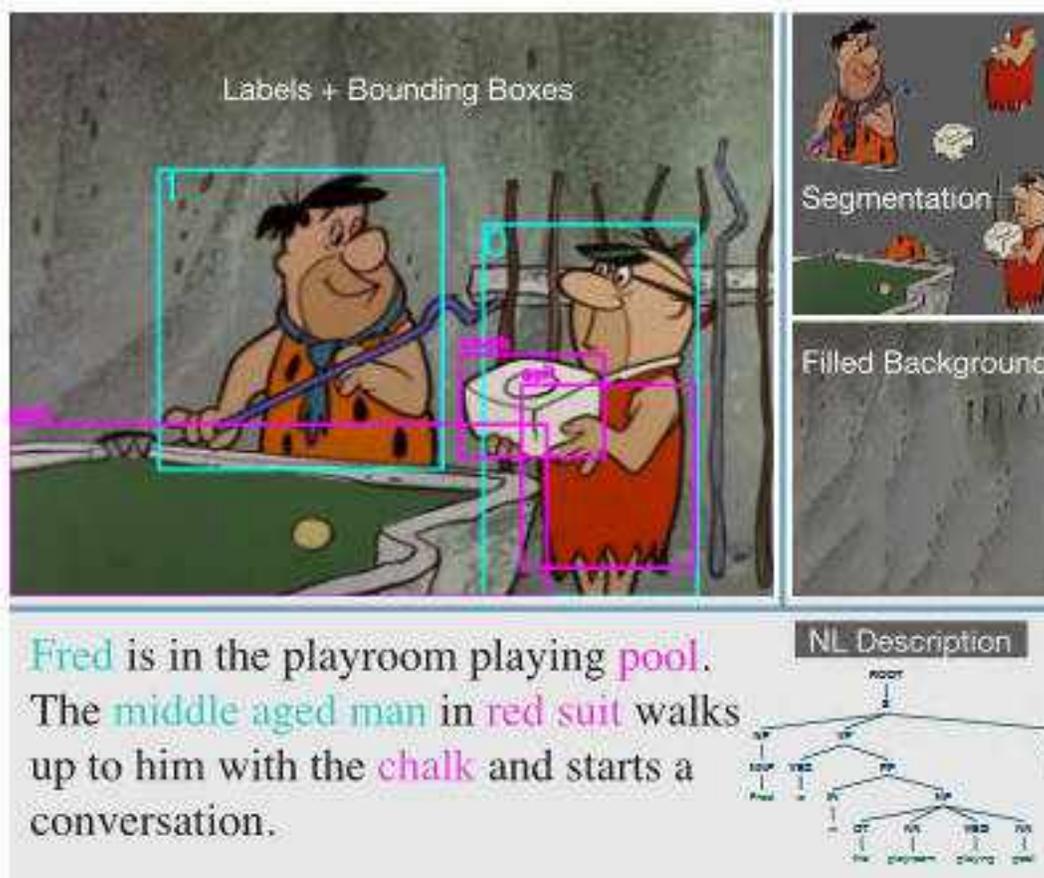
Image 5.91 Adobe Project Sky (Metz, 2018)



Project Sky also considers the color balance of the foreground image and matches the foreground color to the sky color, making it possible to turn a photo of, for instance, the Eiffel Tower on a cloudy day into a properly lit sunset image (Metz, 2018).

The advances in AI video tools to support creative is breathtaking. Researchers have produced an AI system called Craft that automatically produces new “The Flintstones” scenes based on text descriptions.

Image 5.92 AI – Flintstones Maker (Fingas, 2018)

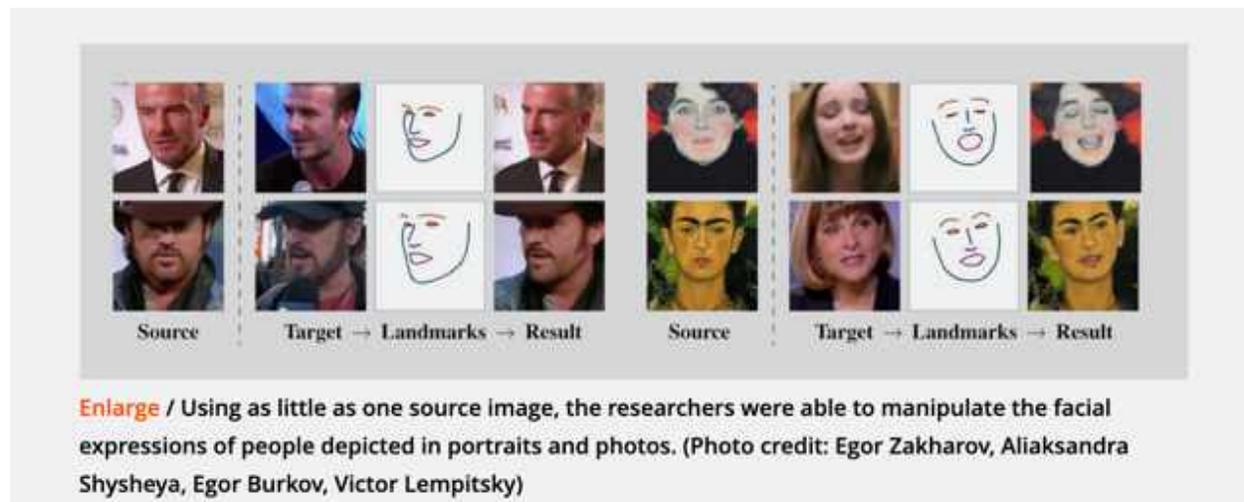


The team trained Craft to recognize 25,000 three-second clips, each of which included tag-descriptions of who was in the scene and what was happening. From there, the AI

only needed a line or two referencing a scene to stitch together characters, backgrounds, and props (Image 5.92) (Fingas, 2018).

Samsung's AI Lab has taken things to the next level generating deepfakes of the Mona Lisa and Marilyn Monroe. The portraits display a new method to create credible videos from a single image. With just a few photographs of real faces, the results improve dramatically, producing what the authors describe as "photorealistic talking heads (Image 5.93) (Barber, 2019)."

Image 5.93 AI Face Generator - Deepfakes (Barber, 2019)



One of the most recent developments in video generation comes from the team at Google's sister division DeepMind. A paper released in the summer of 2019 shows tremendous breakthroughs in the ability to create original AI video clips. Thanks to "computationally efficient" components and techniques and a new custom-tailored data set, researchers say their best-performing model — Dual Video Discriminator

Generative Adversarial Network (DVD-GAN) — can generate coherent 256 x 256-pixel videos of "notable fidelity" up to 48 frames in length. While the size of the data set and complexity of parameters to achieve this goal were immense, the achievement and the directional message is clear. The leading players in AI are approaching a way to generate original video by simply typing in what one wants to create. If one would like a puppy running down the street, the system will create a unique video of a puppy dashing down a sidewalk (Image 5.94) (Wiggers, 2019).

Image 5.94 Dual Video Discriminator Generative Adversarial Network (Wiggers, 2019)



Voice is experiencing incredible AI breakthroughs as well, and many systems are being developed to make the development process easier. Researchers from AI startup Dessa have created what is by far the most convincing voice clone one ever heard,

perfectly mimicking the sound of MMA-commentator-turned-podcaster Joe Rogan (Image 5.95). The intonation, speech-patters, and pause are uncanny. It is almost impossible to pick out the faux Rogan (Vincent, 2019).

Image 5.95 Faux Rogan (Vincent, 2019)



### 5.9 Summary

The industry is in the experimentation phase with AI, and computer scientists are rolling out new tools that will allow AI efforts to scale dramatically. The majority of work to date is simple AI where computer scientists spend hours training AI systems on large volumes of data. Most of the tasks AI replaces today are clerical in nature, like tagging images. The generative design tools developed by Adobe show how AI truly can offer

creatives more time for higher-order thinking. These tools will help with the day-to-day labor of ad making, but the big ideas and the judges of the big ideas are still human.

As AI author Jim Sterne outlines, "creative in connection to AI can be broken into categories. There is the vast majority of the creative marketing output, the cranking out the work; this can be automated with AI. And then there is a way to tell the story or the big idea where AI is playing a role but led by creatives. The human has to be involved to determine what is the best pathway, what makes common sense, what passes the smell test (Sterne, 2019)."

Some of the examples highlighted in this chapter show that machines have a form of intelligence or synthesized thinking. Perhaps the industry is approaching a time when the answer to the fourth Lovelace question will remain no in a theoretical or philosophical sense, but in terms of human reaction and work process, it will be a yes.

When looking back at the survey responses, there is a vast discrepancy between the state of creative-focused AI and the perception of AI in creative. The thesis respondents appreciate the idea of AI playing a supportive role, but the range and depth of that support, as well as the involvement that AI has in strategic thinking, is not fully appreciated.

It almost seems as if advertising executives are not aware of all of the AI development, which may very well be possible. While agencies were involved in many of the

examples cited the leading-edge work in AI is being done at Microsoft, IBM, Google, and breakthrough startups.

Creativity is human today, but one would argue that it would be foolish to think this will remain the case in the future. One finds marketers experimenting with AI. The systems and tool coming on the market to support creatives will make it easier for them to utilize AI. One can quickly imagine more examples of creative solutions that have marketers playing less and less of a role crafting and more judging or evaluating the work. There is a disconnect between the opinions expressed in the survey and where the industry finds itself today in terms of AI and creative work. This divide must be bridged through more active AI education and developing a more collaborative human-AI partnership.

## Chapter 6. AI and Advertising Employment

### *6.1 Introduction*

AI will have an immense impact on work and employment. Former US President Barack Obama prophesized, "The next wave of economic dislocations won't come from overseas. It will come from the relentless pace of automation that makes a lot of good, middle-class jobs obsolete (Miller, 2017)." Several studies, most notably Carl Benedikt Frey's and Michael A. Osborne's 2013 report, support Obama's prediction. Frey and Osborne argue that AI will eliminate 47% of US jobs by 2035 (Frey and Osborne 2013).

AI will have a cataclysmic impact on employment in general, but the impact of AI on the advertising industry is less clear. The research study for this thesis as well as other third-party studies highlights the belief that strategic and creative skills will be the hardest for AI to subsume. Strategic and creative skills are the life-blood of the advertising and marketing industry, which means the impact on jobs may be less.

However, as outlined in this dissertation, the nature of creation and marketing work is changing dramatically. There are new AI systems that support every marketing discipline from design to optimized distribution. Strategic marketing choices are made simple by predictive AI systems that crunch the numbers, analyze, and recommend. Many of these new AI systems absorb the responsibilities of the marketing tacticians. That only leaves a need for high-level strategic planners and creatives, albeit with more profound data analysis and AI system training and management skills.

AI will eliminate thousands of advertising and marketing jobs in all areas of the industry but will also create thousands of new ones. There is a surge of new jobs openings in programming, data cleansing and management, data analytics, AI system training, and management. The question is, will the industry be able to attract new talent and upskill its workers at a level that will balance the reduction in clerical marketing roles?

This chapter examines the impact on advertising jobs and the perceived effect that AI is having on jobs by ad practitioners. The future for AI-supported advertising and marketing employment can be positive, but it requires marketing organizations to have the will to change and consider upskilling and evolving the marketing workforce.

### *6.2 Impact of AI on Employment – Strategy and Creative Talent in Demand*

The results of primary research consistently highlight the perception that high-value roles such as strategy, creative, and company leadership, remain a human function.

This finding parallels the results of other broad, non-category specific studies. The work of the McKinsey Global Institute team shows a steady increase in the evolution of skill categories needed in the economy (Chart 6.1) (Bughin, Hazan, Lund, Dahlström, Wiesinger, Subramaniam, 2018).

Chart 6.1: McKinsey Global’s Acceleration of Skill Shifting (Bughin, Hazan, Lund, Dahlström, Wiesinger, Subramaniam, 2018)

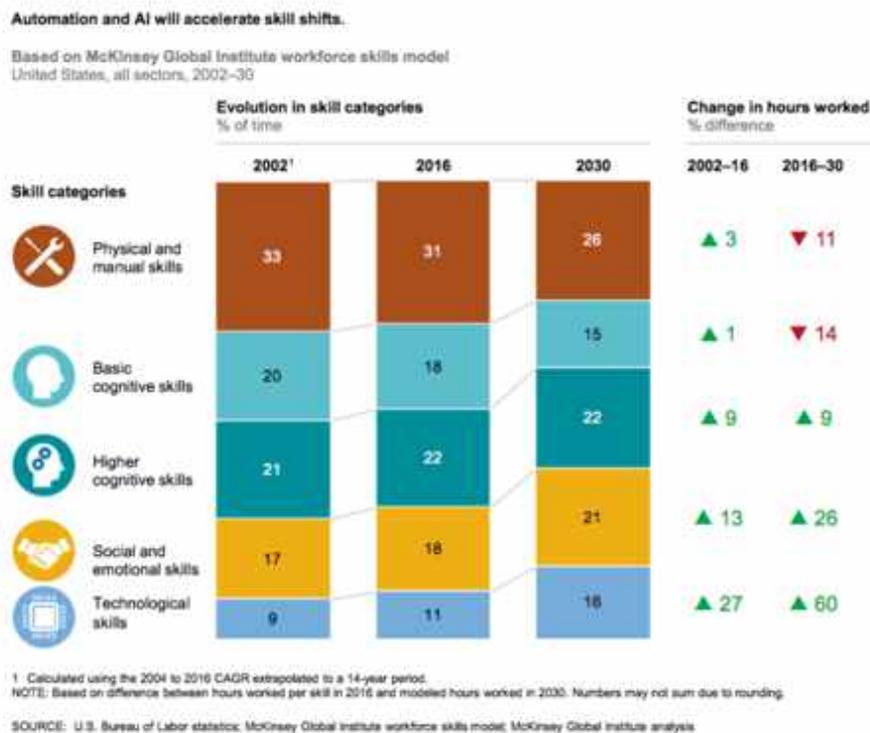


Image: McKinsey Global Institute

By 2030, the McKinsey study reveals an 11% decrease in physical and manual skills and a dramatic increase of 9% for higher cognitive abilities, social and emotional skills, and technological capabilities (Bughin, Hazan, Lund, Dahlström, Wiesinger, Subramaniam, 2018).

Highly cognitive skills include advanced literacy and writing, quantitative and statistical skills, critical thinking, and complex information processing. Professions that typically use these skills include doctors, accountants, research analysts, writers, and editors. Social and emotional skills include advanced communication and negotiation, empathy, the ability to learn continuously, to manage others, and to be adaptable. Types of job functions that utilize these include sales, programming, emergency response, and counseling. Lastly, technological skills include basic to advanced IT skills, data analysis, engineering, and research. The business roles that require this skill set include software developers, engineers, robotics, and scientific experts (Bughin, Hazan, Lund, Dahlström, Wiesinger, Subramaniam, 2018).

A published report from The World Economic Forum (WEF) placed similar emphasis on the critical future success skill-sets. The WEF top ten skills needed to thrive in 2020 ranked by importance were:

- 1) Complex Problem Solving: The capability to see relationships between industries and craft creative solutions to problems that are yet to appear is a must to keep up with AI machines
- 2) Critical Thinking: The ability to turn data into insightful interpretations due to the complexity and interconnectedness of various fields like computer science, engineering, and biology.
- 3) Creativity: The quality of randomness and the ability to build something out of new ideas

- 4) People Management: Robots may acquire analytical and mathematical skills, but they can't replace humans in leadership and managerial roles that require people skills.
- 5) Coordinating with Others: Effective communication and team collaboration skills will be a top demand among job candidates in any industry.
- 6) Emotional Intelligence: Qualities that relate to emotional intelligence, such as empathy and curiosity, will be a significant consideration factor for hiring managers of the future.
- 7) Judgment and Decision-Making: The ability to condense vast amounts of data, with the help of data analytics, into insightful interpretations and measured decisions
- 8) Service Orientation: Offering value to clients in the form of services and assistance will be in demand as businesses would want to provide solutions to the problems of society.
- 9) Negotiation: The ability to negotiate with companies and individuals to come up with a win-win situation is a skill that will be needed to survive in affected industries.
- 10) Cognitive Flexibility: The ability to switch between different personas to accommodate the challenge at hand will be essential to be successful in combined industries (Desjardins, 2018).

Complex problem solving and creativity, both essential skills in advertising and marketing, appear consistently at the top of all lists. This consensus bodes well for marketers' employability in the age of AI. In fact if anything, the studies point to an even higher value that will be associated with marketing and advertising skills going forward.

### *6.3 Impact of AI on Employment – Macro Employment Shifts*

However, AI will restructure the entire job market, and this macro change will undoubtedly have repercussions on demand for marketing and advertising. The Organization for Economic Cooperation and Development (OECD) investigated jobs that were at high risk of AI automation and significant risk of automation.

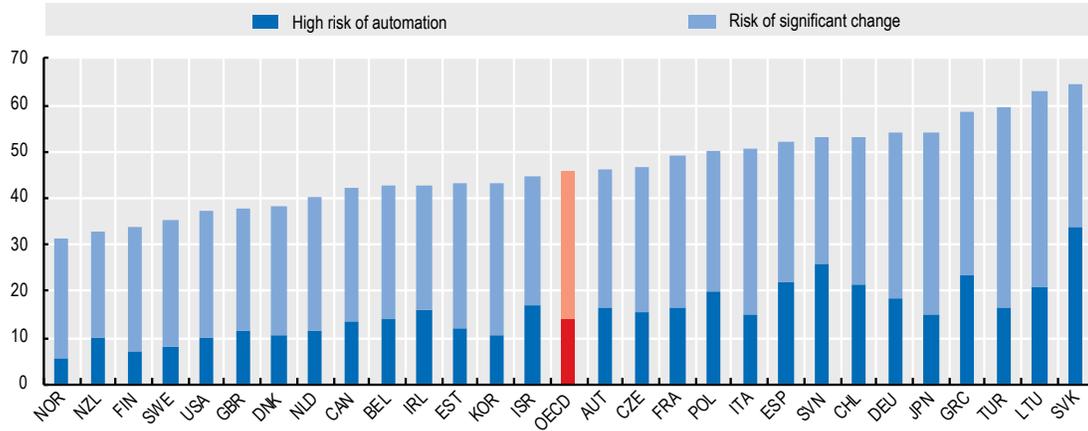
In the US, 10.2% of jobs were found to be under high risk, and 27% were at significant risk.

The Study listed jobs as at high risk of automation if the likelihood of the job being automated was at least 70%. Jobs at risk of significant change are those with the likelihood of the role being automated estimated at between 50% and 70% (Chart 6.2) (Nedelkoska and Quintini, 2018).

Chart 6.2 Jobs at risk of automation in OECD countries (Nedelkoska and Quintini, 2018)

**Figure 2.6. Jobs at risk of automation in OECD countries**

Share of jobs which are at a high risk of automation or a risk of significant change (%)



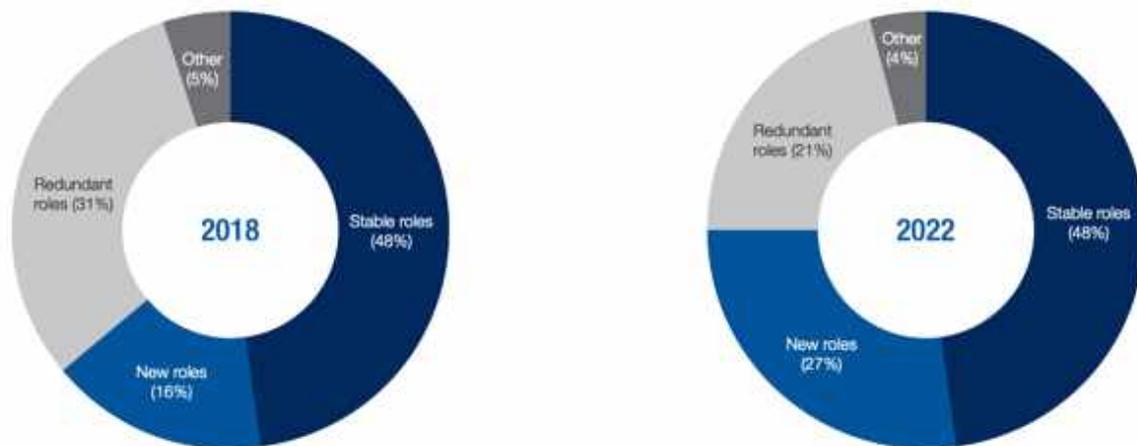
Note: Jobs are at high risk of automation if the likelihood of their job being automated is at least 70%. Jobs at risk of significant change are those with the likelihood of their job being automated estimated at between 50 and 70%. Data for Belgium correspond to Flanders and data for the United Kingdom to England and Northern Ireland.

Source: OECD calculations based on the Survey of Adult Skills (PIAAC) (2012); and Nedelkoska, L. and G. Quintini (2018), "Automation, skills use and training", OECD Social, Employment and Migration Working Papers, No. 202, , <https://doi.org/10.1787/2e2f4eea-en>.

Necessary jobs for this new AI-driven economy will change. The World Economic Forum 2018 Job Survey reviewed the evolution of skills that would become redundant versus the new ones that will be needed (Chart 6.3) (World Economic Forum, 2018).

Chart 6.3 Share of stable, new and redundant roles, 2018 vs. 2022 (World Economic Forum, 2018)

Figure 3: Share of stable, new and redundant roles, 2018 vs. 2022 (projected)



Source: Future of Jobs Survey 2018, World Economic Forum.

Across all industry verticals, by 2022, emerging professions will increase from 16% to 27% of the total employee base of WEF's company respondents. The employment share of declining roles is set to decrease from 31% to 21%. By 2022, the WEF believes that the decline of certain types of jobs (10% decline) will be counter-balanced by job creation and the emergence of new professions (11% growth). About half of today's core jobs, making up the bulk of employment across industries will remain somewhat stable in the period up to 2022 (World Economic Forum, 2018).

#### 6.4 Impact of AI on Employment – Demand for Marketing Creative Endures & Evolves

As outlined in the findings of the thesis survey, strategy and creative remain paramount human-led skills in artistic endeavors. Intuit's Chief Data Officer Ashok Srivastava shares the same viewpoint. Srivastava states, "...the realm of creativity – music, art,

poetry, and literature – these are domains where humans will operate for a long time. I don't mean to say that AI doesn't have a role there, but I think we're going to be very well-suited in those areas (Srivastava, 2018).”

One can imagine senior creative and strategic roles in marketing will continue to be needed, but many of the support or junior advertising positions will be at risk. Chriss Kieff, a thesis survey respondent stated, "Silly grunt work is going on with people sending spreadsheets, all of that sort of work will go away. AB testing and multivariate testing will be completely automated, as well."

Shelley Palmer, a leading tech and media analyst, offers a scenario of the impact of an AI-enabled Graphic Artist. Palmer asks one to imagine a situation where the senior art director of an ad agency has an AI system as a coworker. Traditionally, junior art directors would prepare, process, and proof the work. However, in this AI-supported scenario, this support staff is not required. Instead, the senior art director only has to click a button, and the design returns completed.

This AI-supported model is much faster in terms of turnaround time and much more efficient. There is no need to wait for the work of junior designers, and those jobs can be eliminated from the agency. Perhaps, the senior art director may need to review the work. He may even need to make some edits to finalize it. However, all in all, the AI and Graphic artist collaboration is highly efficient and effective.

Palmer calculates the improved return on investment. He states, "remove ten junior people from payroll who earn between  $\frac{1}{4}$  and  $\frac{1}{2}$  of the wages their supervisor earns. The unit will enjoy a three- to five-fold reduction in annual payroll expense, maybe more. This is an excellent path to value creation (for the shareholders) (Palmer, 2019)."

### *6.5 Impact of AI on Employment – AI and Marketing Sales*

Marketing sales roles require active social IQ, which, based on the studies outlined in this chapter, appear to make them AI-immune. However, AI tools can support and replace several sales and leadership functions. Indeed, the wealth of CRM targeting and optimization tools enhanced by AI available to the sales teams will lead to redundancies of clerical business development positions.

That being said, client meetings and pitches require finding ways to build trust and read human emotional responses. Mediapost staff writer Jack Loechner outlines, "Artificial intelligence in sales does not replace sales reps; it makes them more human. Smartly deployed AI can do the work of research and awareness, and leave the relationship-building and trust creation to the humans on the team (Loechner, 2018)."

### *6.6 Impact of AI on Employment – AI and Management Roles*

Thesis survey respondents viewed leadership as a skill that AI could not replace. Leadership roles received over 27 mentions when participants answered the question,

"What are the jobs that can never be replaced by AI." However, similar to sales, several managerial tasks are already handled by AI in some marketing disciplines. AI technologies control administrative employee performance tracking and monitoring tasks.

In a recent report, journalists from The New York Times explored the use of AI technology by the insurance giant MetLife. In the customer support department, each client representative had a monitor running Cogito software that operates as a kind of adjunct manager. In the bottom-right corner of each customer representative's monitor is a little blue box that tells him how he is performing. "Talking too fast? The program flashes an icon of a speedometer, indicating that he should slow down. Sound sleepy? The software displays an energy cue with a picture of a coffee cup. Not empathetic enough? A heart icon pops up (Roose, 2019)."

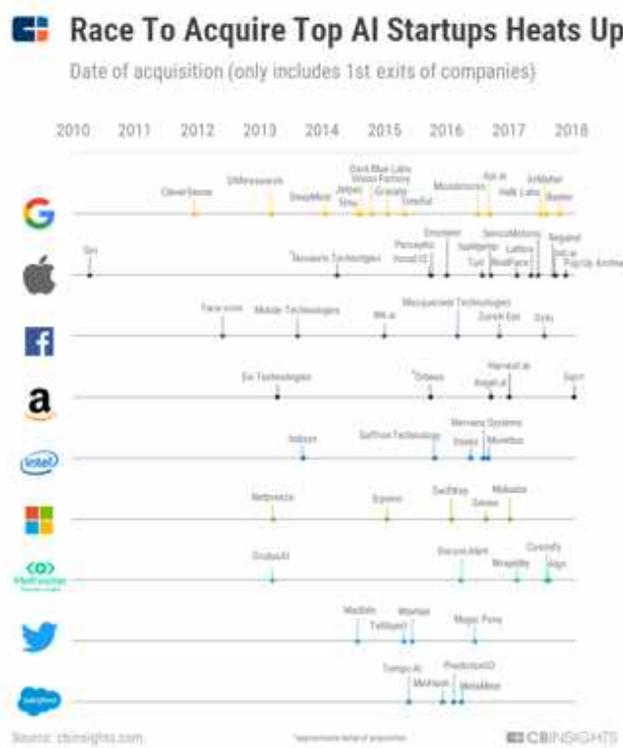
This example from MetLife is reminiscent of the science fiction story *Manna* by Marshall Brain. It begins with the fast-food joint where a Manna-ger is installed that literally tells employees what to do, minute by minute. Brain writes, "Manna was connected to the cash registers, so it knew how many people were flowing through the restaurant. The software could therefore predict with uncanny accuracy when the trash cans would fill up, the toilets would get dirty and the tables needed wiping down. The software was also attached to the time clock, so it knew who was working in the restaurant. Manna also had "help buttons" throughout the restaurant. Small signs on the buttons told customers to push them if they needed help or saw a problem. Manna told employees

what to do simply by talking to them. Employees each put on a headset when they punched in. Manna had a voice synthesizer, and with its synthesized voice Manna told everyone exactly what to do through their headsets. Constantly. Manna micromanaged minimum wage employees to create perfect performance (Sterne, 2017).” Could Publicis’ Marcel be the Manna of the marketing world? It is far too early to tell but the Holding Company’s UK trial of the system certainly has data understanding and real-world efficiency at part of its core list of objectives. Publicis UK chief executive Annette King adds, “...we will have 5,000 people who work together, are sharing clients together, are sharing business development together, and we think that we are going to learn a lot more about how we can help in that real-world solution where we get a lot more real-world data (Lepitak, 2019).”

### *6.7 Impact of AI on Employment – AI and New Skills in Demand*

AI is also creating demand for specific skill sets and types of workers. Today, there is an overwhelming need for computer scientists to work on AI projects, which is leading companies like Facebook, Amazon, Netflix, and Google to buy startups for talent. Over the last five years, leading tech companies acquired 90% of AI startups in Silicon Valley (Chart 6.4) (CB Insights, 2019).

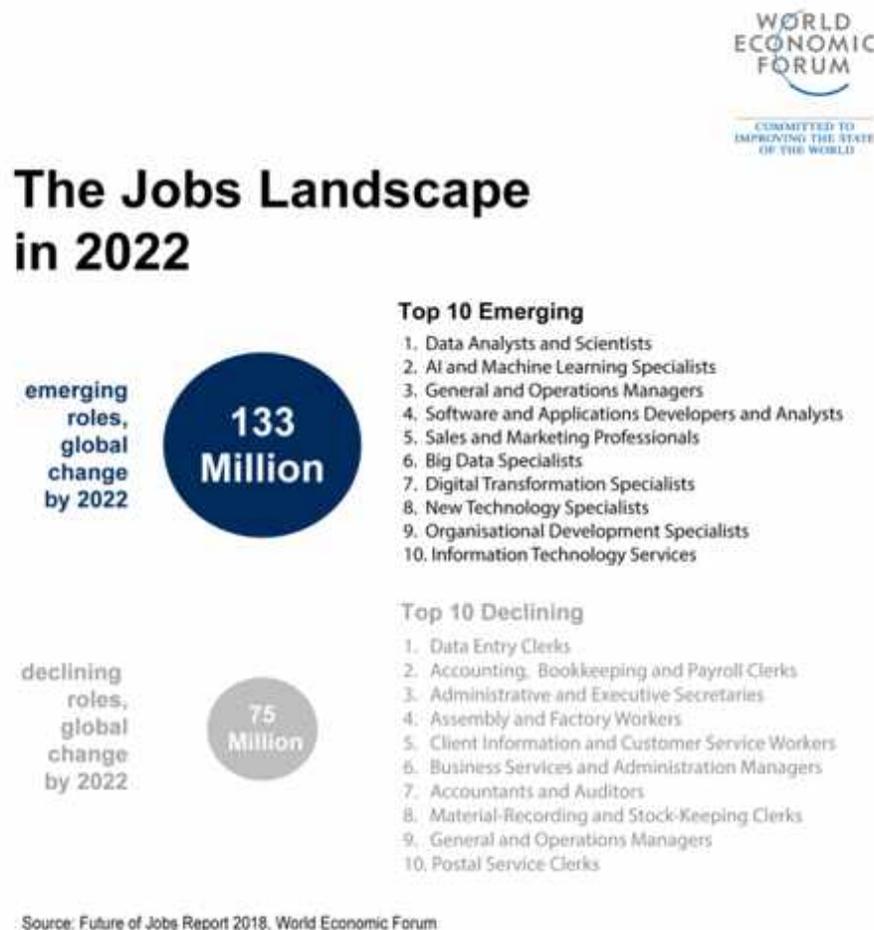
Chart 6.4 Race to Acquire Top AI Startups Heats Up (CB Insights, 2019)



While a few of these companies were acquired for their successful products, the vast majority were purchased to bring the AI talent in-house to work on other AI-related initiatives (Kottenstette, 2018)."

Because of the surge of AI development, there is a desperate need for human technologists. Chief Operating Officer for Thomson Reuter Brian Peccarelli stated, "...in my business, we have an average of 34 technology roles open at any given time. On an industry-wide basis, there are currently four open positions for every technologist currently employed in the US (Peccarelli, 2019)."

Image 6.5 The Jobs Landscape in 2022 (World Economic Forum, 2018).



The LinkedIn 2018 Emerging Jobs Report also published as part of the Future of Jobs Report by the World Economic Forum documented the top ten emerging and declining roles and the number of jobs associated with them (Image 6.5) (World Economic Forum, 2018). AI and Machine Learning Specialists were second on the list with Data Analysts and Scientists topping the list. AI skills are among the fastest-growing skills on LinkedIn, and saw a 190% increase from 2015 to 2017. These skills include expertise in neural networks, deep learning, and machine learning, as well as actual "tools" such as Weka and Scikit-Learn (Perisic, 2018).

### *6.8 Impact of AI on Employment – AI and New Employment Models*

Because of AI, society is at a watershed moment in terms of employment. The advertising industry does not appear to be actively planning for this new reality. However, many top AdTech and media executives, mostly from Silicon Valley, are proposing ideas of how to support the shift to an AI-enhanced industrial era.

Mark Zuckerberg, CEO, and Founder of Facebook publishes his thoughts on AI and employment. Zuckerberg supports the concept of Universal Basic Income (UBI), which in general terms means that the Government offers all citizens a regular income stipend with no mandates. UBI would be given to everyone and not have constraints like time-limits or how the money can be spent. Zuckerberg stated at his Harvard commencement address, "We should explore ideas like universal basic income to make sure that everyone has a cushion to try new ideas (Gillespie, 2017)."

Google's Co-Founder Larry Page advocates for maintaining full employment but reducing the hours each employee needs to work. Page explained, "Most people like working, but they'd also like to have more time with their family or to pursue their own interests. So that would be one way to deal with the problem, is if you had a coordinated way to just reduce the workweek. And then, if you add slightly less employment, you can adjust and people will still have jobs (Lynch, 2014)." Page also advocates for the idea that perhaps people could share the same job.

Amazon's Jeff Bezos champions the idea of upskilling the workforce. In July 2019, Amazon pledged to upskill 100,000 of its employees across the United States. The Company dedicated \$700 million to provide employees access to training that will help them move into more highly skilled roles within or outside of Amazon. Amazon upskilling programs include the Amazon Technical Academy, which equips non-technical Amazon employees with the essential skills to transition into and thrive in, software engineer careers. Also, Amazon offers Machine Learning University, which provides employees with technical backgrounds the opportunity to access machine learning skills via an on-site training program (Amazon, 2019).

Based on a review of the Company's jobs and analysis of hiring data from its US workforce, Amazon's fastest-growing highly skilled jobs over the last five years are data mapping specialist (832% growth), data scientist (505%), solutions architect (454%), security engineer (229%) and business analyst (160%). Within customer fulfillment, highly skilled roles have increased over 400%, including jobs like logistics coordinator, process improvement manager, and transportation specialist within our customer fulfillment network. Through its Upskilling 2025 pledge, Amazon is focused on creating pathways to careers in areas that will continue growing in years to come, including healthcare, machine learning, manufacturing, robotics, computer science, cloud computing, and more (Amazon, 2109).

## 6.9 Summary

AI will be a catalyst for massive job displacement. At the same time, AI will offer many new roles, albeit highly strategic, technical, and creative positions. The research highlights the need to upskill advertising and marketing teams to take advantage and to fill the need for higher-order roles.

The thesis survey results point to the human primacy of areas such as strategy, creative, and leadership. However, one's exploration of AI and the issue of employment reveal that there are many support components of these areas that can be delivered effectively by AI today.

Creative thinkers will remain in high demand, and the changing nature of what is in vogue will make highly-talented creative a resource that will continue to be coveted. As Frey and Osborne observed, "Because creativity, by definition, involves not only novelty but value, and because values are highly variable, it follows that many arguments about creativity are rooted in disagreements about value. Thus, even if we could identify and encode our creative values, to enable the computer to inform and monitor its own activities accordingly, there would still be disagreement about whether the computer appeared to be creative. In the absence of engineering solutions to overcome this problem, it seems unlikely that occupations requiring a high degree of creative intelligence will be automated in the next decades (Frey and Osborne, 2013)."

Nicolas Roope, the executive creative director and co-founder at Publicis agency Poke stated, "The main conversation with AI is always about whether it will 'nick our jobs' and the truth is it probably will, someday. But not for a long time to come (Faull, 2019)." The survey showed that respondents believe creative skills, as well as leadership and strategy, are not at risk. However, each one of these skills already has components where AI is playing a role. One wonders if it is too far-fetched to see how the core responsibilities of these lateral-minded roles could be replaced by AI at some point as well? Employment in marketing and advertising will evolve. In the same way one sees an increase in the demand for AI-related computer science skills in tech companies one will see an increase in demand for AI-related marketing roles like data scientist and data analyst. Ultimately, the realities of capitalism, with its search for more efficiencies, will accelerate AI's impact on employment. The winners and survivors will be those that become the best practitioners of AI technology, knowing how to make the most of it through human and machine efforts. Shelly Palmer states, "You must become the very best AI coworker you can become. No matter how smart you think you are, there are things a well-trained AI system can do better than you can (Palmer, 2019)."

## Chapter 7. AI and Ethics

### *7.1 Introduction*

The complexities around the question of ethics and AI could well be the subject of thousands of thesis. For this dissertation, one will aim to focus on the ethical considerations raised by participants of the research study and the perspectives of advertising professionals uncovered in one's broader research.

A letter written by Alan Turing provides a useful backdrop to the complication of the topic of ethics. In 1952, Turing was charged with gross indecency after admitting to a sexual relationship with another man. Before his trial, Turing wrote a letter to his friend, fellow mathematician Norman Routledge. He worried that somehow his persecution would have negative repercussions on his machine-learning focused work.

Turing wrote,

"I'm afraid that the following syllogism may be used by some in the future.

Turing believes machines think

Turing lies with men  
Therefore machines do not think  
Yours in distress,  
Alan" (Usher, 2016)

Turing pled guilty, and his punishment was chemical castration. He ended his life committing suicide in 1954. Today, most enlightened readers of this thesis will be filled with outrage as to what happened to Turing. Ethical perspectives regarding homosexuality have evolved, and it is almost impossible to imagine atrocities like this occurred. Turing was a victim of unjust British ethics and laws that were created by humans and enforced by humans.

When one considers AI and ethics, one quickly realizes that the ultimate limitation on the discussion revolves less around the shortcomings of AI-enabled technology and more around the changing views and failings of humans. As in the case of Turing, humans created terribly unjust laws, not machines. Many mistakes related to the data that an AI algorithm might use are the fault of human error. If the awesome power of AI gets misused, it will more than likely be humans that use it to manipulate and control. Vladimir Putin described the power of AI. He observed, "Artificial intelligence is the future, not only for Russia but for all humankind. It comes with colossal opportunities, but also threats that are difficult to predict. Whoever becomes the leader in this sphere will become the ruler of the world (Vincent, 2017)."

Large media companies that are grasping for AI-supremacy are also running into major ethical pitfalls. In August of 2019, a report from Bloomberg discovered that Facebook collected audio data and recordings from its users and transcribed it using third-party contractors (Whittaker, 2019). This news follows several years of consumer data mishandling such as the high-profile improper sharing of personal data of about 50 million Americans with a political consultancy called Cambridge Analytica (Wong, 2018).

As AI usage proliferates, there are more questions asked about the ethical use of this technology and the data that fuels it. Indeed, AI in an unregulated state can cause tremendous dilemmas. Nick Bostrom, Director of the Future of Humanity Institute at the University of Oxford, is one of the top experts on the existential risks that AI and machine learning could potentially pose for humanity. Bostrom outlined a potential AI scenario referred to as the paperclip maximizer.

Imagine that one designs an AI to operate a paperclip factory. The AI system is dumb initially but gets smarter and gets better and better at running the paperclip factory. The owner of the factory is happy and pushes for more progress. The challenge arises when, "the AI becomes sufficiently smart, it realizes that there are other ways of achieving an even greater number of paperclips in the world, which might then involve taking control away from humans and indeed turning the whole planet into paperclips or into space probes that can go out and transform the universe into more paperclips (Ford, 2018)."

The paperclip maximizer is a fun example of an ethical dilemma taken to the absurd extreme to highlight a point. However today AI faces some very real ethical quandaries in marketing executions. The two overarching moral areas that receive scrutiny today are the use, handling, and privacy of customer data and racial or gender bias baked into the algorithms that power the technology. This chapter will review the perception and concerns regarding ethics by advertising executives today and assess those viewpoints against the state of AI ethical consideration in the industry.

## *7.2 State of AI Ethics – Bias*

Ethical concerns such as privacy and racial bias arise during many new AI-enabled product roll-outs. A famous example was the creation of a social media Twitter-based AI by Microsoft called Tay.ai in March of 2016. Microsoft, with its search engine team Bing, built an AI messaging Bot called Tay, which appeared on Twitter but also other social channels like Kik and GroupMe. Tay.ai was created to message with younger millennial consumers using "their language." In less than 24 hours after its arrival on Twitter, Tay.ai gained more than 50,000 followers and produced nearly 100,000 tweets (Reese, 2016). Tay.ai appeared to be a success.

However, the launch quickly devolved into a PR nightmare for Microsoft. Tay.ai stopped pushing out upbeat and friendly tweets and, instead, started to post racist, misogynistic, and antisemitic messages. Immediately, Microsoft shut down the chatbot and blamed Tay.ai's inappropriate messages on online trolls that flooded the training content of the

AI system with unseemly posts. The trolls orchestrated a "coordinated effort" to trick Tay's "commenting skills."

Tay.ai became the beacon example regarding AI and racism (Image 7.1) (Reese, 2016). Civil rights activist DeRay McKesson commented, "It's shocking and problematic that Microsoft's AI Twitter account started tweeting racist and problematic statements (McKesson, 2016)." The cause seemed to be a lack of controls over offensive data training the system.

Image 7.1 Tay.ai (Reese, 2016)



Catherine Williams, Chief Data and Marketplace Officer of AppNexus warns marketers about the risks of situations where bad data can undermine the AI system. Williams states that marketers, "should also be cognizant of the quality and provenance of their

data - poor quality data will produce poor results for marketers, regardless of the algorithm or method of automation (Williams, 2019).” The AI system was learning from online trolls that were feeding the model racist text, thus normalizing racism for the AI system. Microsoft took Tay offline to make adjustments in the algorithm (Barbaschow, 2019).

Companies like Microsoft are learning and fixing their AI models to combat such problems. Microsoft Cybersecurity Field CTO Diana Kelley re-examined the Tay.ai experiment in 2019. Kelley explained, "Learning from Tay was a really important part of actually expanding that team's knowledge base, because now they're also getting their own diversity through learning. Looking at AI and how we research and create it in a way that's going to be useful for the world, and implemented properly, it's important to understand the ethical capacity of the components of AI (Barbaschow, 2019).”

Amazon suffered a related challenge more recently with the flawed performance of its facial recognition technology Rekognition. Joy Buolamwini is a computer scientist and digital activist based at the MIT Media Lab. Her recent paper showed that Amazon's system Rekognition made no mistakes when identifying the gender of lighter-skinned men. However, Rekognition mistook women for men 19% of the time and identified darker-skinned women for men 31% of the time. Buolamwini found similar racial and gender biases in facial recognition systems designed by IBM, Microsoft, and Chinese company Megvii (Buolamwini, Raji, 2019).

The Tay.ai and Rekognition examples highlight the challenges around racial and gender bias. As AI is more accepted in businesses and in professions like advertising the dialogue is shifting from whether AI will function to discussions about ethics. Investor and educator in AI Manoj Saxena wrote, "Given the potential power of AI and the free reign humans may be willing to allow it, parameters need to be set. There is an urgent need for building AI systems that are free from bias, transparent in their operations, and are able to reflect the core values and policies of the business." Hopefully, issues such as gender bias will disappear as women gain more representation in the field of AI. A recent study found that women represent only 12% of leading researchers in machine learning (Chin, 2018).

### *7.3 State of AI Ethics – Training AI*

Many of the problems regarding AI bias start with the training data. Rekognition was not trained on a robust multicultural and gender-balanced data sample, so it is not surprising that such a system would make mistakes in identification. The system was not designed to be sexist or racist, but the training information inputted by the computer scientists into the model led to flawed and ethically challenging results. If the data is not balanced and representative, then the output will be problematic.

AI systems in development get trained via open databases that have ethical challenges in terms of balance and privacy. Stanford University's Brainwash database contained over 10,000 images and almost 82,000 annotated headshots. A team of AI researchers

created the database in 2014 and named it after a San Francisco café where Stanford researchers tapped into a camera and took the photos that populated the database. The database's heavy focus on a student crowd led to imbalances in the actual data sample, and the approach to gathering the images and lack of transparency with consumers raises several privacy concerns. These problems get compounded because the Stanford researchers, as do many AI academic researchers, share the Brainwash database with other universities. There is not a background check or analysis of the use of the information. Chinese academics associated with the National University of Defense Technology used Brainwash data.

Image 7.2 Duke MTMC Database (Metz,2019)



The Duke researchers ultimately gathered more than two million video frames with images of over 2,700 people. Open Data Commons Attribution License, via Megapixels

Duke researchers created an even more extensive database called MTMC, with over two million video frames with images of over 2,700 people (Image 7.2) (Metz, 2019). Cited projects used the MTMC data in the US, China, Japan, and Britain. The MTMC database started collecting data in 2014 using eight cameras spread around campus.

Many questions abound regarding permission to utilize the images and video as well as the uncontrolled proliferation of the media (Metz, 2019).

Once data is out there, it is very challenging to find ways to bring it back. Moreover, the protocol for the management and return of data once baked into an AI model remains opaque. Rob May is the CEO of AI data management firm Talla. May explains the problem of trying to pull data back once utilized by an AI system. In an interview, May stated, "The challenge for artificial intelligence, context and data, and privacy is that you need this data to train your neural network model. What's interesting is you can't get the data back out of the model. If I use a big pile of data, and I train a model, and then I get rid of the data, the model is dependent on the data, but I can't get the data back out of the model."

May goes on to review the ethical challenges when a client is no longer a client and wants their data back. He asks, "Do we need to delete their data from the data set, and then retrain our model? Alternatively, can we just delete their data so that nobody has access to it, but we can continue to use this model that was partially trained on their data? In general, companies have been pretty OK about letting us keep derivatives of the data (Fawkes, 2018)."

#### *7.4 State of AI Ethics – Government, Legislation, and Public Policy*

Governments are working to find ways to protect customer data. Perhaps the most famous piece of legislation to date is the General Data Protection Regulation (GDPR) in the European Union. GDPR is a regulation in EU law on data protection and privacy. GDPR aims primarily to give control to individuals over their data and to simplify the regulatory environment for international business by unifying the regulation within the EU (EU, 2018).

The fines associated with GDPR are hefty. In July 2019, the Information Commissioner's Office (ICO), Britain's independent authority to uphold information rights in the public interest, announced its intention to fine British Airways £183m. The punishment was in connection with an incident in September 2018 when hackers redirected user traffic to a fraudulent website that harvested the personal and account information of about 500,000 customers. ICO announced a day later that it planned to fine Marriott International £99m in connection with a November 2018 data breach that exposed personal data contained in approximately 339 million guest records globally, of which around 30 million related to residents of 31 countries in the European Economic Area (EEA), including seven million in the UK (Ashford, 2019). Because of the fines, companies are re-thinking the risks associated with data usage and re-structuring liability. One solicitor, Sarah Williamson, stated, "This announcement (the GDPR fines) will now make people very nervous and could make negotiating liability clauses far trickier (Davies, 2019)."

The risk for AI to be used for malicious activities is real, and the consequences are significant. Take, for example, one use of AI in China where government-contracted companies are using AI to erase the memory of the pro-democracy Tiananmen Square massacre from online memory. The AI software can pick out images of actual Tiananmen Square incidents and mentions. It can flag and block any social media posts that allude to dates, images, and names associated with the protests. One worker involved stated, "When I first began this kind of work four years ago, there was opportunity to remove the images of Tiananmen, but now the artificial intelligence is very accurate (Grothaus, 2019)."

Erasing collective memory is just one example of the potential nefarious uses of AI. Groups such as the Future of Privacy Forum mapped the potential harms from automated decision-making. The chart groups AI potential harms into four categories, loss of opportunity, economic loss, social detriment, and loss of liberty (Chart 7.3).

Chart 7.3 Potential Harms from Automated Decision-Making (FPF Staff, 2017)

Potential Harms from Automated Decision-Making		
Individual Harms		Collective / Societal Harms
Illegal	Unfair	
<b>Loss of Opportunity</b>		
<b>Employment Discrimination</b> E.g. Filtering job candidates by race or genetic/health information		<b>Differential Access to Job Opportunities</b>
<b>Insurance &amp; Social Benefit Discrimination</b> E.g. Higher termination rate for benefits eligibility by religious group		
<b>Housing Discrimination</b> E.g. Landlord relies on search results suggesting criminal history by race		<b>Differential Access to Insurance &amp; Benefits</b>
<b>Education Discrimination</b> E.g. Denial of opportunity for a student in a certain ability category		
<b>Economic Loss</b>		<b>Differential Access to Housing</b>
<b>Credit Discrimination</b> E.g. Denying credit to all residents in specified neighborhoods ("redlining")		<b>Differential Access to Education</b>
<b>Differential Pricing of Goods and Services</b> E.g. Raising online prices based on membership in a protected class		
<b>Narrowing of Choice</b> E.g. Presenting ads based solely on past "clicks"		<b>Differential Access to Credit</b>
<b>Social Detriment</b>		<b>Differential Access to Goods and Services</b>
<b>Network Bubbles</b> E.g. Varied exposure to opportunity or evaluation based on "who you know"		<b>Narrowing of Choice for Groups</b>
<b>Dignitary Harms</b> E.g. Emotional distress due to bias or a decision based on incorrect data		
<b>Constraints of Bias</b> E.g. Constrained conceptions of career prospects based on search results		
<b>Filter Bubbles</b> E.g. Algorithms that promote only familiar news and information		<b>Stereotype Reinforcement</b> E.g. Assumption that computer decisions are inherently unbiased
<b>Confirmation Bias</b> E.g. All-male image search results for "CEO," all-female results for "teacher"		<b>Loss of Liberty</b>
<b>Constraints of Suspicion</b> E.g. Emotional, dignitary, and social impacts of increased surveillance		<b>Increased Surveillance</b> E.g. Use of "predictive policing" to police minority neighborhoods more
<b>Individual Incarceration</b> E.g. Use of "recidivism scores" to determine prison sentence length (legal status uncertain)		<b>Disproportionate Incarceration</b> E.g. Incarceration of groups at higher rates based on historic policing data



The FPF states, "We hope that by identifying and categorizing the harms, we can begin a process that will empower those seeking solutions to mitigate these harms (FPF Staff, 2017)."

Also, The Future of Privacy Forum offers potential solutions to these problems (Chart 7.4) (FPF Staff, 2017).

Chart 7.4 Potential Mitigation Sets (FPF Staff, 2017)

Potential Mitigation Sets		
Harms	Description	Mitigation Tools
<b>Individual Harms – Illegal</b>		
<ul style="list-style-type: none"> <li>Employment Discrimination</li> <li>Insurance &amp; Social Benefit Discrimination</li> <li>Housing Discrimination</li> <li>Education Discrimination</li> <li>Credit Discrimination</li> <li>Differential Pricing</li> <li>Individual Incarceration</li> </ul>	Existing law defines impermissible outcomes, often specifically for protected classes	<ul style="list-style-type: none"> <li>• <b>Data methods</b> to ensure proxies are not used for protected classes &amp; data does not amplify historical bias</li> <li>• <b>Algorithmic design</b> to carefully consider whether to use protected status inputs &amp; trigger manual reviews</li> <li>• <b>Laws &amp; policies</b> that use data to identify discrimination</li> </ul>
<b>Individual Harms – Unfair (with illegal analog)</b>		
<ul style="list-style-type: none"> <li>Employment Discrimination</li> <li>Insurance &amp; Social Benefit Discrimination</li> <li>Housing Discrimination</li> <li>Education Discrimination</li> <li>Credit Discrimination</li> <li>Differential Pricing</li> <li>Individual Incarceration</li> </ul>	Individual harms that could be considered illegal if they involved protected classes, but do not in this case	<ul style="list-style-type: none"> <li>• <b>Business processes</b> to index concerns; ethical frameworks &amp; best practices to monitor &amp; evaluate outcomes</li> <li>• <b>Laws &amp; policies</b> include tools like DPIAs to measure impact or enable rights to explanation</li> </ul>
<b>Collective/Societal Harms (with illegal analog)</b>		
<ul style="list-style-type: none"> <li>Differential Access to Job Opportunities</li> <li>Differential Access to Insurance Benefits</li> <li>Differential Access to Housing</li> <li>Differential Access to Education</li> <li>Differential Access to Credit</li> <li>Differential Access to Goods &amp; Services</li> <li>Disproportionate Incarceration</li> </ul>	Group level impacts that are not legally prohibited, though related individual impacts could be illegal	<ul style="list-style-type: none"> <li>• Same as above section</li> <li>• <b>Laws &amp; policies</b> should consider offline analogies &amp; whether it is appropriate for industry to identify &amp; mitigate</li> </ul>
<b>Individual Harms – Unfair (without illegal analog)</b>		
<ul style="list-style-type: none"> <li>Narrowing of Choice</li> <li>Network Bubbles</li> <li>Dignitary Harms</li> <li>Constraints of Bias</li> <li>Constraints of Suspicion</li> </ul>	Individual impacts for which we do not have legal rules. Mitigation may be difficult or undesirable absent a defined set of societal norms	<ul style="list-style-type: none"> <li>• <b>Business processes</b> to index concerns; ethical frameworks &amp; best practices to monitor &amp; evaluate outcomes</li> <li>• <b>Laws &amp; policies</b> should consider whether it is appropriate to expect industry to identify &amp; enforce norms</li> </ul>
<b>Collective/Societal Harms (without illegal analog)</b>		
<ul style="list-style-type: none"> <li>Narrowing of Choice for Groups</li> <li>Filter Bubbles</li> <li>Stereotype Reinforcement</li> <li>Confirmation Bias</li> <li>Increased Surveillance of Groups</li> </ul>	Group level impacts for which we do not have legal rules or societal agreement as to what constitutes a harm	<ul style="list-style-type: none"> <li>• Same as above section</li> </ul>
Key		
Loss of Opportunity	Economic Loss	Social Stigmatization
		Loss of Liberty



The Chart of Potential Mitigation Sets categorize harms that are similar to each other so that they could be amenable to the same resolution strategies (FPF, 2017).

While the FPF proposals may not be the entirely realistic solutions, this mapping acts as a clarification of the problem and a step for more significant collective action. Many groups are stepping forward to work on the ethical challenges of AI. Governments, non-governmental organizations (NGO's) and major corporations are working to define and share ethical standards for the utilization of AI.

Some of the key ethical AI documents include:

1) Asilomar AI Principles: Developed in conjunction with the 2017 Asilomar conference, this list of principles has been universally cited as a reference point by all other AI ethics frameworks and standards introduced since it was published. Signed by more than 1,200 AI and robotics researchers and over 2,500 other technical luminaries, including the likes of Stephen Hawking, Elon Musk, and Ray Kurzweil, it offers a simple list of foundational principles that can guide business leaders, governmental policymakers, and technologists as we move forward with AI advancement.

2) IAPP: Building Ethics Into Privacy Frameworks for Big Data and AI - a concise explanation of the ethical concerns at play in applied uses of AI and big data, as well as the consequences of ignoring these issues. It then offers a condensed run-down of the tools available to organizations seeking to not only develop internal frameworks but to operationalize data ethics policies. It guides AI ethics leaders in considering industry-specific concerns, organizational nuances, and even departmental differences in

creating a framework that is as flexible as it is holistic. According to the IAPP report: "Various data ethics frameworks should have common features to ensure a uniformly high ethical standard of data practices. However, these frameworks will be most effective if they are flexible enough to be tailored for each specific company and organization, adjusting for a company's size, resources, subject matter area, and impact on data subjects."

3) IEEE: The IEEE Global Initiative on Autonomous Systems - Since 2016, IEEE has been taking the lead on organizing discourse among technical thinkers, business leaders, and public policy experts about the ethical design of autonomous and intelligent systems. As part of this work, The IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems published *Ethically Aligned Design*, a veritable bible for addressing "values and attentions as well as implementations" of these systems. Also, The IEEE Global Initiative spearheads work on IEEE P7000 Standards Working Groups, which offers standards guidance processes for addressing ethical concerns during system design, data privacy, algorithmic bias, and other hot topics in AI ethics.

4) The Public Voice: Universal Guidelines for Artificial Intelligence: Introduced in October 2018, these guidelines were written to be "incorporated into ethical standards, adopted in national law and international agreements, and built into the design of systems." It's a human rights-driven document with an emphasis on transparency,

fairness from bias, data accuracy, and quality, and an obligation by government to curtail secret profiling or scoring of citizens. "Our concern is with those systems that impact the rights of people," write its creators. "Above all else, these systems should do no harm."

5) EU Council of Europe: Guidelines on Artificial Intelligence and Data Protection - Drafted by an independent group of AI ethics advisors and improved using more than 500 comments during a five-month feedback period, this is one of the most recent and comprehensive public frameworks on AI ethics to date. This is not an official policy document or regulation by the European Commission, but instead a set of suggestions meant to guide public discourse on what trustworthy AI looks like. These guidelines are intended to help AI designers and users choose systems that are lawful, ethical, and robust, with seven system tenets at the heart of what it takes to create trustworthy AI:

*Human agency and oversight:* Including fundamental rights, human agency, and human oversight

*Technical robustness and safety:* Including resilience to attack and security, fall-back plan and general safety, accuracy, reliability, and reproducibility

*Privacy and data governance:* Including respect for privacy, quality, and integrity of data, and access to data

*Transparency:* Including traceability, explainability, and communication

*Diversity, non-discrimination, and fairness:* Including the avoidance of unfair bias, accessibility, and universal design, and stakeholder participation

*Societal and environmental wellbeing:* Including sustainability and environmental friendliness, social impact, society and democracy

*Accountability:* Including auditability, minimization, and reporting of negative impact, trade-offs, and redress (McClurg, 2019).

### 7.5 State of AI Ethics – Corporate Policies

Companies like Google are also trying to self-regulate themselves on the topic of AI to avoid political and customer dilemmas. In June 2018, Google released a set of principles to guide its work in artificial intelligence after being internally and externally scolded for work they were doing for the Department of Defense. The document titled *Artificial Intelligence at Google: our principles*, does not directly reference the Department of Defense work but makes clear that the company will not develop AI for use in weaponry (Google, 2019). It also outlines several broad guidelines for AI, touching issues like bias, privacy, and human oversight.

More recently, Google tried to form an AI Board of Ethics, referred to as the Advanced Technology External Advisory Council (ATEAC). The advisory board included several prominent academics in fields ranging from AI and philosophy to psychology and robotics. However, it also included those with policy backgrounds. The board dissolved

because of internal and external protest around the board's inclusion of Heritage Foundation president Kay Coles James, a well-known conservative figure who has openly espoused anti-LGBTQ rhetoric and, through the Heritage Foundation, fought efforts to extend rights to transgender individuals and to combat climate change (Statt, 2019).

### *7.6 Summary*

The ethical challenges in AI remain daunting. There are many areas where things could go awry. Consumer data is a moral minefield as AI developers assess what data to use to train systems, how to legally gather information, and the protocol and legality around sharing data. Human error on an experimental AI level can lead to public embarrassment for the developers be it can be controlled. However, what happens when AI solutions operate at scale? How do we make sure the appropriate safeguards are in place?

As AI in marketing moves from an experimental phase to scale, there is no doubt that human error will occur. Many groups are working on possible ethical frameworks. Moreover, marketers, based on the thesis survey, seem aware of critical issues that plague the AI-ecosystem and share the same concerns.

Jason Jercinovic, global head of marketing innovation and global brand director at Havas, commented, "We are advertisers, not ethicists. However, that doesn't excuse us

from considering the social impact of the work we do. We know there's a line that can -- and probably will -- be crossed with AI. Therefore, we must establish best practices for the use of AI in advertising, and understand the differences between what we can know, should know, and shouldn't know (Jercinovic, 2017)."

While survey respondents are aware of ethical issues related to AI, the industry is not leading the charge to resolve them. Sarah Fay, an AI investor and former advertising executive, champions the cause for more active marketing industry involvement on ethical matters. She highlights the Universal Guidelines for AI (UGAI) as a useful document for marketers to support. The guidelines include a set of principles that developers and users of AI must consider in order to avoid the violation of human rights: rights to transparency and human determination; obligations of identification, fairness, accountability, validity, quality, public safety, cybersecurity, and termination; and prohibitions on secret profiling and unitary scoring.

Fay calls for marketers to act as their organizations' conscience. Fay exclaims, "We are in a new era, and AI will be playing a major role in marketing careers. No one has it all figured out. No matter which position you hold or where you rank, consider yourself part of your company's conscience (Fay, 2018)." This call to ethics reflects today's early stage of development and maturity of AI in the marketing space. One can hope that marketers turn general awareness and concern into ethical action.

## Chapter 8. AI and Education

### *8.1 Introduction*

This chapter examines AI education and the lack thereof in the marketing field. Eliezer Yudkowsky, co-founder and research fellow at the Machine Intelligence Research Institute, wrote, "By far the greatest danger of Artificial Intelligence is that people conclude too early that they understand it (Yudkowsky, 2008)." The thesis results show the opposite for marketing practitioners. Respondents to the survey overwhelmingly highlighted their poor understanding and limited education on the topic. In marketing, perhaps the greatest danger is admitting to not understanding and then doing little to remedy the problem.

AI is an emerging field, and it is hard to teach something that is being re-invented each day by computer scientists. However, one would imagine the gravity of AI's impact on all

aspects of the marketing profession would lead to an accelerated training program like the upskilling plans at Amazon. Marketers are not educated on the strategy, execution, and application of AI and are not planning to add new training programs. The thesis study shows that only 18% of respondents say that their company offers training in AI.

One cannot argue that the lack of educational programs for AI in marketing is a reflection of the limited awareness and information on the topic. There are many studies from the World Economic Forum, Aspen Institute, and multiple trade sources that call attention to the need for education and training schemes to secure the future of the existing workforce and recruit the next.

There is already a shift in highly sought skills in the labor market, and talented Generation Z marketers are hungry for more training. The U.S. Bureau of Labor Statistics anticipates some of the fastest-growing job categories are increasingly in more skilled areas, including statisticians and software developers (U.S. Bureau of Labor Statistics, 2019). Ironpaper, an advertising agency, listed skills like analytics, quantitative communication, digital tool, platforms and channels experience, and a hunger for continuous learning as essential for the modern marketer (Ironpaper, 2016). The Robert Half and Enactus survey of Generation Z workers (born 1990-1999) showed that a whopping 91 percent cited professional training as an essential factor when choosing an employer (Half, 2018).

A wealth of resources exists online already to teach anything from the basics of AI to the most advanced programming capabilities. Companies such as Google and well-funded start-ups like OpenAI generously offer dozens of classes. The painful reality is that learning about AI for marketers is perceived as nice to have, but not a need to have. One thesis respondent stated that her company had an internal academy that offered training, "BUT it's optional." The courses are available, but marketers are not attending them.

The AI educational programs available to marketers cover the basics, but perhaps even more is needed. Wayne Deakin, executive creative director of Huge EMEA, calls for broader change. Deakin exclaims, "We need to start to shift the basics of the next generation to an education model that is future-ready and not rooted in old school, irrelevant practices (Deakin, 2019)."

This chapter contrasts the research to support education in AI and marketing and then explores the state of AI training in general. While worries continue about the ethical challenges of training a machine, there are equal weighty concerns about the problems of not teaching marketing professionals properly about AI.

## *8.2 Educational Trends and Ideas – Future AI Skills Needed*

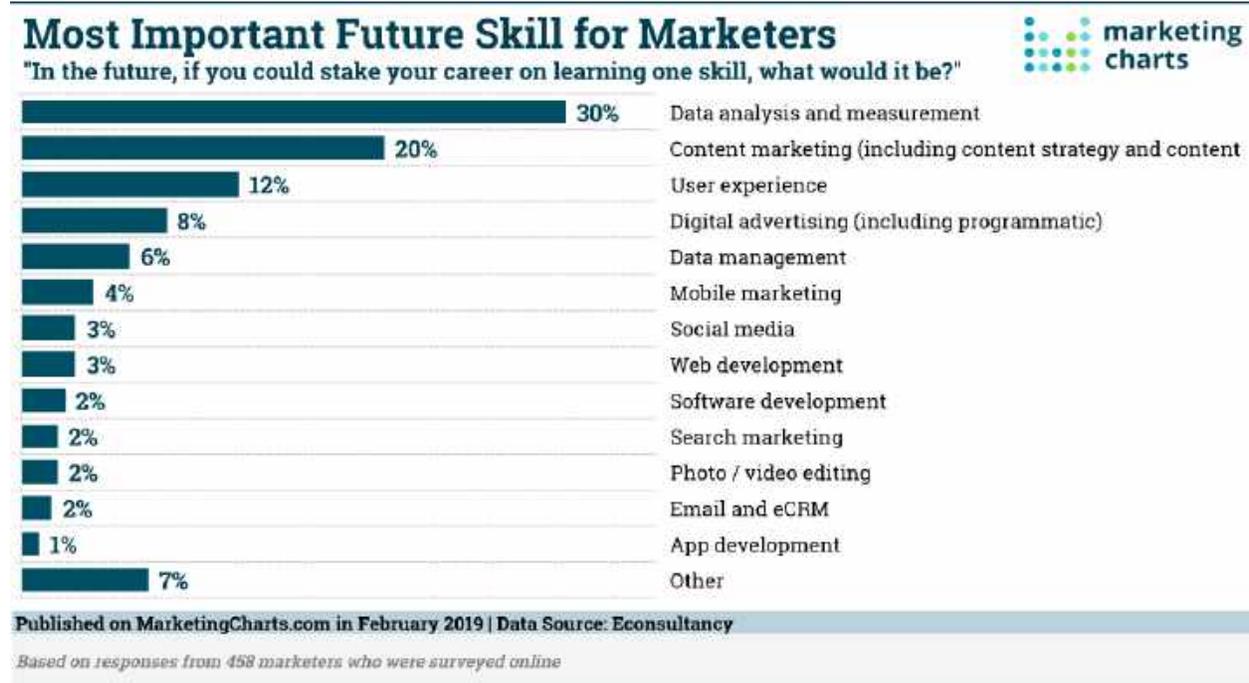
The primary research for this thesis showed a clear lack of understanding of AI and its impact on the advertising and marketing industry. At the same time, there is little

training offered within the respondents' workplaces, and any training needs appear to be met by a combination of ad hoc resources, like Google, seminars and online courses.

A study by Econsultancy on the most important future skills for marketers offers parallel results to the thesis study. The quantitative study completed in February 2019 included over 500 marketers and a review of the academic and professional literature related to marketing skills (Donnelly, 2019).

One question in the Econsultancy study was, "In the future, if you could stake your career on learning one skill, what would it be?" This question relates to the thesis question, "What aspects of Artificial Intelligence do you feel you need to know more about in your current role?" Over 30% of those surveyed for the Econsultancy study listed data analysis and measurement at the top of the list, which directly matches the top response of data organizing and structure in the thesis survey (Chart 8.1) (Donnelly, 2019).

Chart 8.1: Most Important Future Skills via Econsultancy (Donnelly, 2019)



Content marketing appeared as the second most popular response, with 20% of respondents listing this area as fundamental for a future marketing career. Once again, the response parallels the thesis survey's second most popular answer, which was predictive messaging (an AI-enabled subset of content marketing). Programmatic appeared in the top five of both surveys. The future of marketing work demands training in data analysis and technical marketing areas such as programmatic.

Interestingly, the Econsultancy study also highlighted the importance of softer, more human skills. Nearly all (93.9%) of the survey's respondents felt that soft skills were just as essential as technical skills for a successful career in marketing. The vast majority (70%) of participants in the Econsultancy study also viewed the ability to embrace change as a vital skill for a successful marketing career (Donnelly, 2019).

Pooja Khandelwal, Product Marketing Manager at impress.ai, an AI-Powered Chatbot Platform for Recruiters, emphasizes the importance of five skills the AI bots cannot master. She advises all professionals to take steps to train in at least one of the areas involving creativity, empathy, planning, physical ability, or judgment.

The Five Skills that AI bots cannot master:

### 1. Creativity

Having an imagination and thinking outside the box means that one can come up with ideas that do not already exist. While AI machines can create art, music, and write, they do so by recognizing patterns and analyzing data as opposed to producing something new. Coming up with the initial seeds for a concept that has not previously existed is uniquely human.

### 2. Empathy

Another aspect that makes us human is the ability to empathize with others. This trait is especially useful in service-related fields or areas dealing with people. For example, impress.ai, an AI recruitment software for recruiters, can perform the initial stages of qualifying candidates by conducting competency-based interviews at scale. After that, to complete the hiring process, a human would need to be involved in meeting candidates and making the final decision. No matter how developed AI chatbots become, they will not have the innate ability to connect with and understand people on an emotional level to make final decisions.

### 3. Planning

If one ever played chess online against a computer, one will know that it is as competitive as playing against a real person. Strategic games like these tend to be bound by rules and outcomes based on logic. They are predictable, for example, "if this, then that" and therefore relatively easy for a computer to "learn." However, when it comes to real-world scenarios, the future is not as predictable. Many jobs require navigating through uncertain outcomes, shifting priorities, and filling information gaps. For example, project managers have to balance various factors, consider timelines, and weigh priorities when planning assignments across teams to meet one common goal.

### 4. Physical Ability

In the same way that people can appreciate the creativity and unique talents of a cartoonist or a scriptwriter, they can also appreciate the level of skill required when a human being can hit a home run, come first in a race, or score the winning touchdown.

### 5. Judgment

Imagine if a bot could replace a lawyer in legal matters. In ambiguous situations, it would be unsettling to allow AI to call the final shots. In matters related to ethics, things are not always black and white. Put simply, the concept of "should" versus "should not" does not exist for a bot. Despite scenarios where facts may be supported by the law, many conflicts involve a degree of emotion and irrationality. For example, either

side of a legal case may not proceed rationally, or may have hidden motives. Because of this, much of a paralegals' time and effort involves searching for and gathering data, which is a repetitive task where a bot would excel. However, the position of a lawyer or a judge, which both involve a higher level of thinking, cannot be replaced by a bot (Khandelwal, 2018).

Future AI-proof marketers need training and education in areas that will make them data-savvy, technically skilled at predictive content, and trained on digital programmatic platforms. However, future marketers must also retain strong soft-skills, such as high social and communication ability.

### *8.3 Educational Trends and Ideas –Speaking the Language of Data Scientists*

Another critical skill is how marketers learn to work with data scientists. There is a language barrier between the two disciplines. A reporter from the trade publication Digiday anonymously asked a data scientist that works with marketers what his thoughts and concerns were about advertising professionals and whether marketers understood data science. The anonymous data scientist responded, "Marketers don't know what they're asking for when they ask for a data scientist. Most small businesses don't need a data scientist; they need someone to handle a spreadsheet or a data analyst. Marketers are often confused about whether they want data analysts or data scientists and interchange the terms. If a company asks for a person who can work in

Excel, they're looking for a data analyst, but if they are talking about R, Python or machine learning, they're looking for a data scientist, regardless of what they call the job (Liffreing, 2018).”

Learning how to communicate and contextualize data insights is also a critical ability for AI-enabled marketing. Kirill Eremenko, the founder and CEO of SuperDataScience, an online educational portal for data scientists and data science enthusiasts, explained, "Data is massively complex and comprehensive, which makes it difficult even for experts to understand. Extracting insights is the first step, but the crucial follow-up is finding ways to communicate and contextualize those insights so they're accessible to all." Marketers must empower themselves by learning to analyze data alongside data scientists broadly (Olenski, 2018).

#### *8.4 Educational Trends and Ideas –Is Coding a Necessity?*

Some believe that marketing going forward will require proficiency in coding. One voice in favor of marketers coding is Ryanair CMO Kenny Jacobs, who argues the next generation of CMOS will need to be able to build their own websites. "Marketers should absolutely be able to look at a website and know-how that website is working and the code behind it," Jacobs argues. "I don't believe in the model that the CMO should do the traditional marketing, and the chief digital officer should do the digital marketing job. I think you should have the right customer officer doing the right job that straddles both (Rogers, 2017).”

### *8.5 Educational Trends and Ideas – Training Options*

Marketers must develop a blend of hard data expertise and soft social skills to succeed in an AI-enabled era. To date, the options for marketing education are inadequate. In September of 2017, The Association of National Advertisers (ANA) issued a scathing report highlighting academia's lackluster role in preparing students for jobs in the advertising industry.

The report found that universities bear much of the blame, with outdated curricula and a lack of real-world preparation. The ANA kicked off several efforts to improve the situation. Firstly, it started Pathways 2020, which brings professors into agencies to advance their learnings. The ANA aims to have 1,000 professors engaged in on-site industry experiences and visits. "It seems that every time I go out, I'm learning something new that, frankly, didn't exist before," explains Jeff Richards, who teaches in Michigan State University's advertising and public relations department. He's boosted his knowledge, he says, about everything from "analytics to geofencing." The ANA also plans to put an additional 1,000 students through internships and other immersion programs by 2020 (Wohl, 2018) (Lum, 2017).

Universities are beginning to bolster their offerings for the AI era. The University of California, Berkeley, and Massachusetts Institute of Technology created new institutions within their campuses to address the rise of AI. Berkeley created the Division of Data Science and Information that will utilize faculty members and students across the

flagship UC campus. MIT founded the Schwarzman College of Computing intending to reorient MIT to bring the power of computing and AI to all fields of study (Toppo, 2018).

MIT already offers AI and Business courses through its Sloan School of Business. A flip through the prospectus for the online certificate program highlights the areas that MIT focuses on for general business executives such as marketing professionals.

#### Module 1 an introduction to artificial intelligence

This introductory module guides one through the evolution of key AI technologies and how they have developed to transform industry and business practice.

#### Module 2 machine learning in business

In this module, one explores the core concepts of machine learning – an AI technology which aims to design, understand, and use computer programs to learn from experience. Discover how machine learning can be successfully integrated into business functions through case studies and faculty-led videos that examine the opportunities that this subfield of AI affords.

#### Module 3 natural language processing in business

This module is devoted to natural language processing (NLP), An AI technology developed to process human language intelligently. Through case studies and faculty-led videos, which explore functions such as machine translation, summarization, and sentiment analysis, one will learn how NLP can be skillfully deployed in a series of business contexts.

#### Module 4 robotics in business

This module delves into the key elements of robotics as a transformative AI technology, with a focus on automating processes and tasks.

#### Module 5 artificial intelligence in business and society

In this module, one will see examples of other kinds of AI as well as return to collective intelligence and the human-machine relationship. Here one will also consider the impact of AI on jobs, and the ethical and social implications of AI integration.

#### Module 6 the future of artificial intelligence

This module will allow one to imagine the future of AI and its potential use in one's organization (Gois, 2019) (MIT, 2019).

There are examples of some AI training coming from within the industry. Pioneers like Paul Roetzer, the CEO of agency PR 20/20 in Cleveland, Ohio are bringing AdTech partners together to create a conference and a content hub focused on AI marketing. MAICON, the Marketing Artificial Intelligence Conference, is an event for practitioners and leaders seeking to drive the next frontier of digital marketing transformation within their organizations. MAICON is built to help marketers:

*Understand AI:* Discover terminology, use cases, case studies, trends, and technologies.

*Strategize AI:* Access processes, best practices, tools, templates, and resources.

*Experience AI:* Engage in workshops, labs, interactive exhibits, and a science fair.

*Activate AI:* Explore the opportunities and challenges of piloting and scaling AI.

*Improve AI:* Monitor, measure, and adapt based on performance (Marketing Artificial Intelligence Institute, 2019)

The conference also has a website content hub that offers resources that explore the current and future potential of AI, machine learning, deep learning and cognitive computing to transform marketing (Marketing Artificial Intelligence Institute, 2019).

### *8.6 Educational Trends and Ideas – Upskilling*

While the ANA's actions, the new courses springing up at colleges, and conferences like MAICON are steps forward, such efforts will not meet the scaled needs of an AI-enabled industry. Marketers need to consider upskilling. Upskilling is the process of learning new skills or teaching workers new skills. Mainly, upskilling happens when companies invest in training programs that help their employees develop new abilities and minimize skill gaps. In an increasingly AI world, the need for upskilling is sizeable.

Leading foundations and companies are sounding the call for the business community to adopt bold upskilling efforts. In January 2015, The Aspen Institute created Upskill America. UpSkill America was created to answer President Barack Obama's call for employers to come together to do more to provide opportunities for advancement for front-line and entry-level workers at a time when many Americans were feeling left behind in the economic recovery. A coalition of businesses, education, and workforce

training, philanthropy, and human resources organizations joined together to help create UpSkill America as part of the Economic Opportunities Program at the Aspen Institute.

Obama stated at the time, "Today we are partnering with business across the country to UpSkill America. To help workers of all ages earn a shot at better, higher-paying jobs even if they don't have a higher education. We want to recruit more companies to help provide apprenticeships and other pathways so people can upgrade their skills. We are all going to have to do that in this new economy (The Aspen Institute, 2019)."

Amazon is an excellent example of a company embracing the call for upskilling. In July 2019 Amazon pledged to upskill over 100,000 US employees for in-demand jobs by 2025. As part of its' upskilling efforts, Amazon is announcing new training opportunities and expanding on existing programs for employees across the US. One of the new upskilling programs is Amazon's Machine Learning University (MLU). MLU helps Amazonians with a background in technology and coding gain skills in Machine Learning. As AI plays an increasingly important role in customer innovation, MLU helps employees learn core skills to propel their career growth – skills that are often learned only in higher education. The MLU program requires only half to one full day of participation a week. Over 400 Amazon AI specialists teach the classes. MLU is on track to train thousands of employees (Amazon, 2019).

Amazon's upskilling efforts are vast, touching all areas of the global enterprise. Jeff Bezos and his team launched Amazon's Technical Academy, a training and job

placement program that equips non-technical Amazon employees with the essential skills to transition into, and thrive in, software engineering careers. There is Amazon's Launching Associate2Tech program that provides fulfillment center associates the opportunity to move into technical roles, regardless of their previous IT experience. Also, Amazon's Growing Career Choice program pays up to 95% of tuition and fees towards a certificate or diploma in qualified fields of study, leading to enhanced employment opportunities in in-demand jobs. Since launching Career Choice in 2012, over 25,000 Amazonians have received training for high-demand occupations including aircraft mechanics, computer-aided design, machine tool technologies, medical lab technologies, and nursing. The company is investing in expanding the program by building additional classrooms in its fulfillment centers globally and expects to have over 60 on-site classrooms by the end of 2020. Amazon's commitment is open to all employees and all parts of the business. No advertising or marketing groups are coming close to this level of upskilling effort.

### *8.7 Educational Trends and Ideas – Abundance of cost-effective ways to learn AI*

While companies such as Amazon invest heavily in AI upskilling programs, cost-effective online resources are abundant for marketing professionals to get started. Google offers a broad range of courses in all areas of AI and discusses some of the challenges, like avoiding bias.

Landing.ai offers free, downloadable valuable strategic guides like the AI Transformation Playbook. Andrew NG, former AI leader at Google and Baidu, is the founder of Landing.ai. Ng shares his advice on how to roll-out AI in an enterprise via Landing.ai (Landing.ai, 2018).

Ng's Playbook has five steps:

1. Execute pilot projects to gain momentum
2. Build an in-house AI team
3. Provide broad AI training
4. Develop an AI strategy
5. Develop internal and external communications

### *8.8 Educational Trends and Ideas – Using AI for Training*

Perhaps the solution for how to train marketers about AI is to utilize AI itself to make learning easier. AI can be employed to help marketers to learn more and faster. Firstly, marketers can adapt to their individualized needs by utilizing AI. This type of learning is already happening through the growing numbers of adaptive learning programs, games, and software. These adaptive systems respond to the needs of the student, putting greater emphasis on specific topics, repeating things that students have not mastered, and generally helping students to work at their own pace, whatever that may be.

Secondly, it can point out places where courses need to improve.

Teachers may not always be aware of gaps in their lectures and educational materials that can leave students confused about certain concepts. Artificial intelligence offers a way to solve that problem. Coursera, a massive open online course provider, is already putting this into practice. When a large number of students are found to submit the wrong answer to a homework assignment, the system alerts the teacher and gives future students a customized message that offers hints to the correct answer.

Thirdly, students could get additional support from AI tutors. While there are things that human tutors can offer that machines cannot, at least not yet, the future could see more students being tutored by tutors that only exist in zeros and ones. Some tutoring programs based on artificial intelligence already exist and can help students through basic mathematics, writing, and other subjects.

Lastly, AI may change where students learn, who teaches them, and how they acquire necessary skills. Using AI systems, software, and support, students can learn from anywhere in the world at any time, and with these kinds of programs taking the place of certain types of classroom instruction, AI may replace teachers in some instances (TeachThoughtStaff, 2018).

Ultimately, perhaps marketers will be able to use Elon Musk's latest technology Neuralink that promises to be able to upload content and data directly into one's brain (Caddy, 2019).

## 8.9 Summary

Marketers need to get more intelligent about artificial intelligence. The thesis research shows a lack of understanding of AI and an absence of educational programs to support marketers within their companies. The study also shows the critical areas that marketing practitioners welcome support and training. While advertising professionals do need to strengthen quantitative and analytical skills for the AI-era, they also need to strengthen the human skills needed to optimize and partner with AI most effectively.

The marketing industry is not developing AI training at the accelerated pace of machine-learning development. There are no Amazon upskilling-like projects happening in the advertising industry to date. Perhaps it is because of cost. When thesis participants were asked about barriers to AI adoption, the third most selected response was investment/budgetary constraints (183 total mentions). However, there are many free courses online available through sources highlighted in the survey. If an organization so chose to design their own AI program there are several curricula, like MIT's program, to draw from. When asked what source one would use to learn about AI, the majority of participants selected Google (252 mentions). Marketers appear to know where to go to find inexpensive training, yet; it appears not to be happening. All in all, AI learning today for a marketer appears to be optional.

## Chapter 9. The Future of AI

### 9.1 Introduction

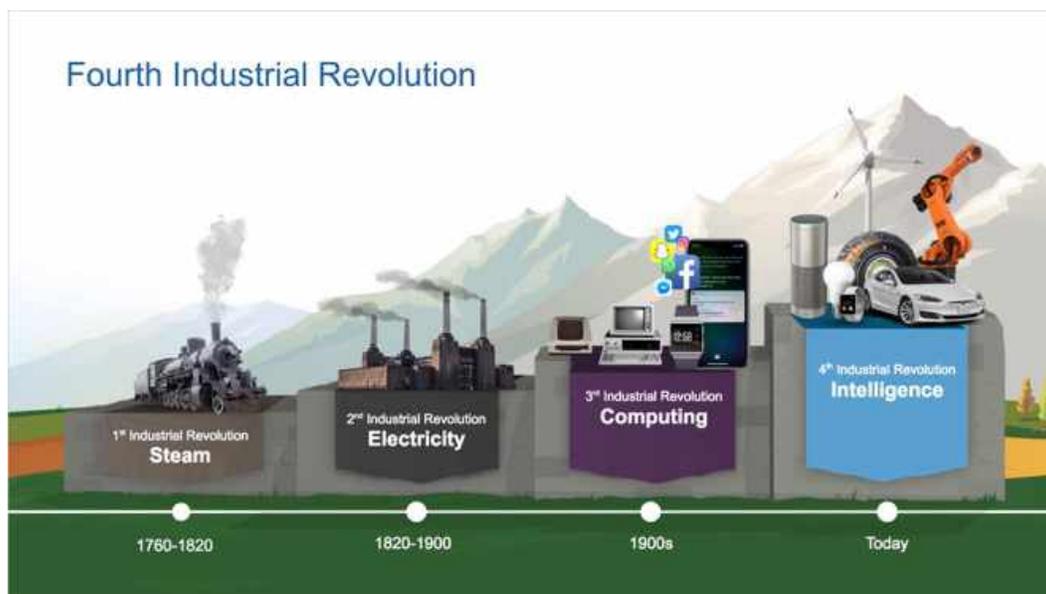
AI offers a limitless future full of potential but also awash in challenges. Theoretical physicist Stephen Hawking captured the delicate balance that one must recognize when planning for a future with AI. Hawking prophesized, “The real risk with AI isn’t malice but competence. A super-intelligent AI will be extremely good at accomplishing its goals, and if those goals aren’t aligned with ours, we’re in trouble. You’re probably not an evil ant-hater who steps on ants out of malice, but if you’re in charge of a hydroelectric green energy project and there’s an anthill in the region to be flooded, too bad for the ants. Let’s not place humanity in the position of those ants (Hawking, 2018).” The thesis research results show ranges of reactions to the future of AI by marketers. Survey participants are excited but fearful, open to the possibilities but closed to the idea of a

machine doing creative better than a human. Perhaps most importantly, marketers are aware that they are not ready for the change.

There is a growing consensus that the future will usher in a new industrial revolution.

Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, coined the term the Fourth Industrial Revolution to capture the next phase of societal development of which AI is a critical ingredient. Schwab views this next era as one filled with disruptive changes in technology, connectivity, and the merging of hardware, software, and biology. Critical parts of this emerging period will come from the fields of robotics, nanotechnology, quantum computing, biotechnology, the internet of things, 5G wireless technologies, and artificial intelligence (Schwab, 2015) (Chart 9.1) (Baxter, 2018).

Chart 9.1: The Fourth Industrial Revolution (Baxter, 2018)



On the topic of AI, Schwab writes, "Already, artificial intelligence is all around us, from self-driving cars and drones to virtual assistants and software that translate or invest. Impressive progress has been made in AI in recent years, driven by exponential increases in computing power and by the availability of vast amounts of data, from software used to discover new drugs to algorithms used to predict our cultural interests. Digital fabrication technologies, meanwhile, are interacting with the biological world on a daily basis. Engineers, designers, and architects are combining computational design, additive manufacturing, materials engineering, and synthetic biology to pioneer a symbiosis between microorganisms, our bodies, the products we consume, and even the buildings we inhabit (Schwab, 2015)."

Schwab's AI-driven world is taking shape. Of the 9,100 patents received by IBM inventors in 2018, 1,600 (or nearly 18 percent) were AI-related (Thomas, 2019). Between now and 2030, it will create an estimated \$13 trillion of GDP growth (Bughin, Seong, Manyika, Chui, Joshi, 2018). Moreover, this momentum appears not to be slowing down or heading towards a natural "winter" as occurred in the late 1960s and early 1970s in the field of AI. "Lots of industries go through this pattern of winter, winter, and then an eternal spring," Andrew Ng, former AI lead for Google, and Baidu says of other fields of endeavor in human history. "We may be in the eternal spring of AI (Ray, 2018)."

Advertising will be re-invented in the Fourth Industrial Revolution. AI will be the force of change deconstructing and re-building every media, tech platform, and creative service

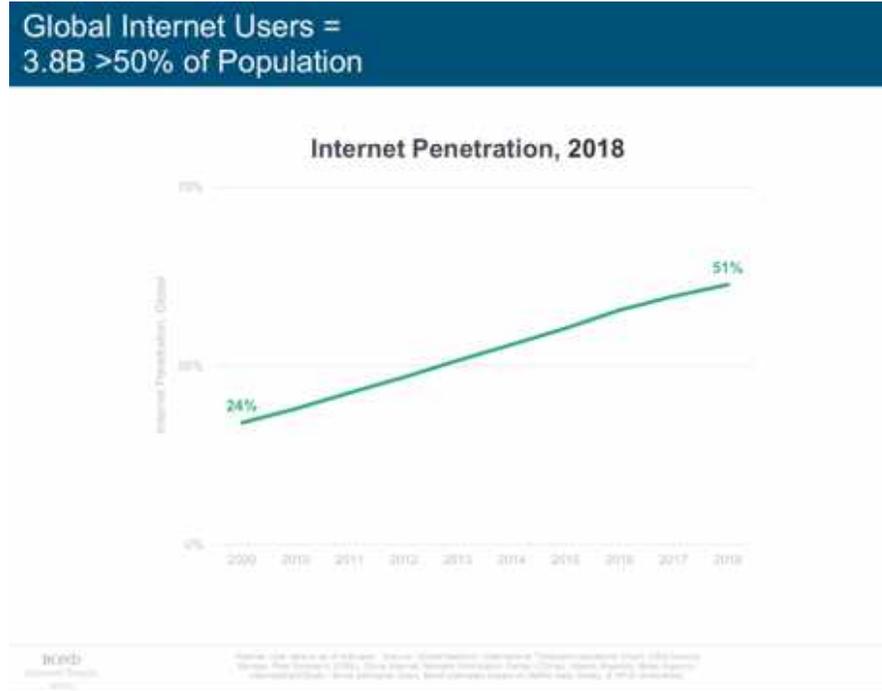
delivery option. AI will also play a more pronounced role in the areas of marketing strategy and ideation.

This chapter will review the thesis study results that asked practitioners how they perceived an AI-driven future. It will then contrast those findings against the predicted changes AI will have on the future of marketing and society in general.

### *9.2 Exploration of the AI Future – The Changing World*

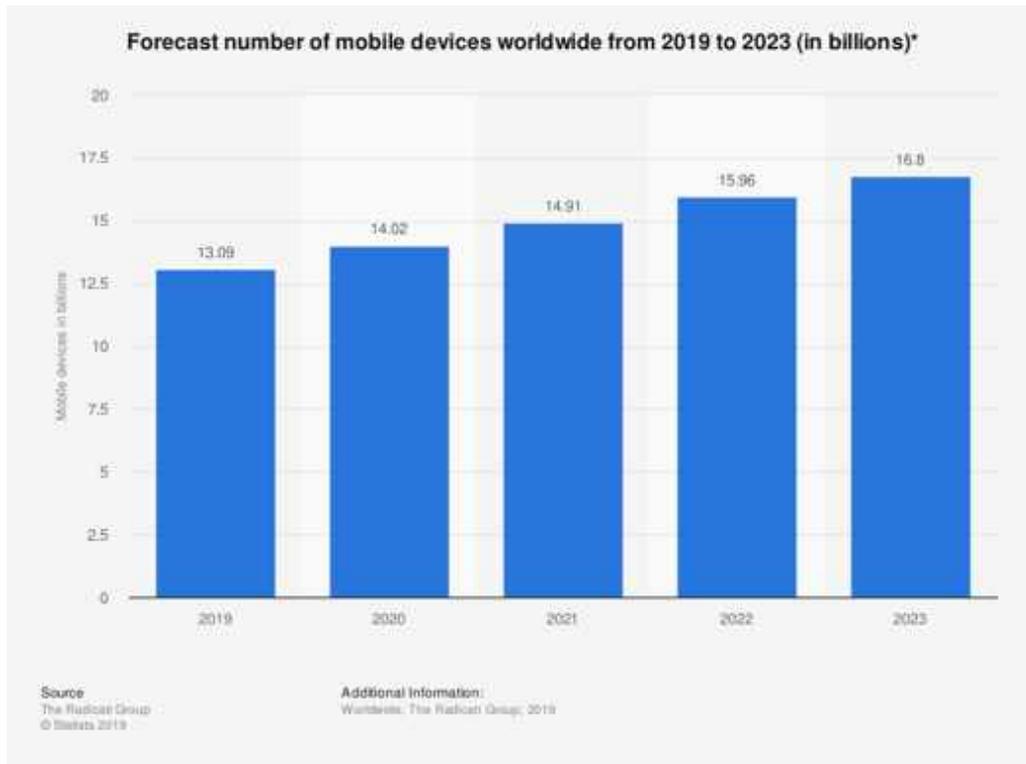
Whether one is an optimist or pessimist about AI, there is no doubt that marketing going forward will be different. Schwab's prognostication of a 4th Industrial Revolution outlines a set of changes that will alter all aspects of society, evolve the profile of consumers, and change all executional elements of marketing. This shift to an AI-enabled advertising industry starts with the critical ingredients of the 4th Industrial Revolution, data, and connectivity.

Chart 9.2: The Growth of Internet Users on a Global Scale (Meeker, 2019)



One can envision the pathway to 100% global connectivity. Already there are 3.8 Billion global internet users, which is greater than 50% of the world population (Chart 9.2) (Meeker, 2019). The IDC predicts that the Global Datasphere will grow from 33 Zettabytes in 2018 to 175 Zettabytes by 2025. By that point, 75% of the world's population, or 6 billion people will have digital connectivity, and all connected people will have at least one data interaction every 18 seconds (Reinsel, Gantz, Rydning, 2018). By 2035 one can imagine society will be 100% connected with an abundance of data on everything.

Chart 9.3: Forecasting the Number of Mobile Devices Worldwide (Statista, 2019)



Some of the consequences of all of this data and digital connectivity are relatively predictable. The number of connected devices that people use will expand. For example, the research group Radicati predicts that the number of mobile devices will grow from 13.09 billion today to 16.8 billion by 2023 (Chart 9.3) (Statista, 2019).

Just to put that number into context, there are only 7.7 billion people in the world as of June 2019, according to the most recent United Nations estimates (United Nations, 2019).

### 9.3 Exploration of the AI Future – All will be Digital

Other more traditional channels will become wholly digital and provide tons of useful marketing data for AI-enabled targeting. For example, digital billboards will be

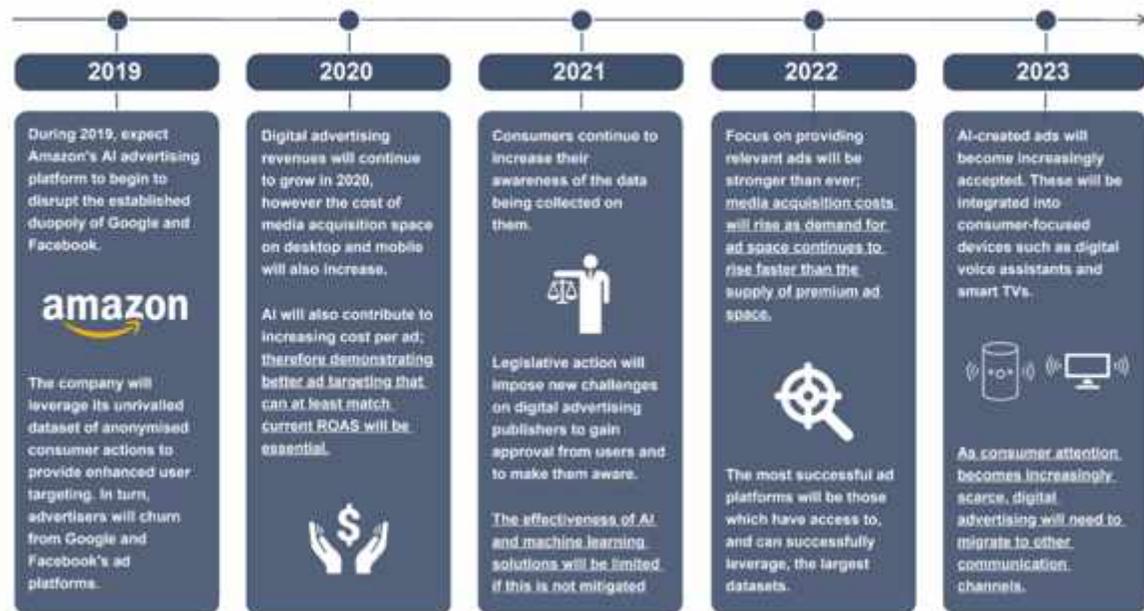
everywhere. The global Digital-Out-Of-Home (DOOH) market is expected to grow at a compound annual growth rate of 12.6 percent from 2017 to 2023, according to a report by Allied Market Research. The market will reach more than \$8 billion by 2023 (Kumar and Baul, 2018).

AI will power a surge in trackable digital ad spend. Digital advertising will reach \$520 billion by 2023 compared to \$294 billion in 2019. This predicted annual growth of 15 percent over the next five years will be a result of highly targeted artificial intelligence (AI)-based programmatic advertising and digital ads that include in-app, digital out-of-home (OOH) and over-the-top (OTT) television content (Barker, 2019).

AI will be at the center of almost every significant change and discussion in digital marketing. Companies that are leaders in the use of AI such as Amazon will grow as they create extremely efficient, targetable, and attributable marketing opportunities. Juniper Research outlined its prediction for the future of media. The Report highlighted Amazon as a significant emerging media player in 2019, stating that Amazon, "...will leverage its unrivaled dataset of anonymized consumer actions to provide enhanced user targeting." By 2023, Juniper predicts that AI created ads will be accepted and that AI will start to utilize voice and TV in immersive and effective ways (Chart 9.4) (Barker, 2019).

Chart 9.4 AI 5-Year Roadmap 2019-2023 (Barker, 2019)

Figure 4: Artificial Intelligence in Advertising: The 5-Year Roadmap 2019-2023



Source: Juniper Research

#### 9.4 Exploration of the AI Future – Call Centers and Email

Call centers will be highly AI-enabled in the next five years. Rob May, CEO of Talla, a company that builds intelligent, conversational versions of enterprise applications, states, "So, to predict what the world might look like in 5 years: I expect voice-to-text, parsing, and NLU to be largely solved problems, with platforms that execute them operated by tech giants like Google, Amazon, and Microsoft, and with plenty of vertically targeted or open-source alternatives as well (May, 2017)." Such technology will usher in a customer support experience that will seem more human and efficient in terms of processing problems and concerns.

AI will enhance email marketing. Email remains one of the more powerful channels to utilize for marketing. In a survey conducted in 2015 by email marketing technology

Image 9.5 Which Mkt. Channels will exist in 10 years (Litmus, 2015)



company Litmus, consumers were asked which marketing channels would still exist in ten years. Over 70% stated that email marketing would always be a primary channel (Image 9.5) (Litmus, 2015). Anthony Chiulli, Director of Product Marketing for email Saas Platform 250ok, forecasted, "AI will continue to deepen its roots in all aspects of email marketing and reset the boundaries on what automation offers to marketers. We are seeing evidence of this today in the way machine learning is making content creation, personalization, and send-timing "smarter" by being able to crunch and analyze data and trends at a pace far beyond the capabilities of man (Martinez, 2018)."

### 9.5 Exploration of the AI Future – CRM

CRM systems will become more potent with AI. Falon Fatemi, a rising AI star after spending six years at Google and now the CEO of AI-as-a-service company Node, outlines five areas in CRM that will improve with AI:

1) The task of ingesting and retrieving data will become more seamless.

Sales professionals spend 17% of their time entering data. AI will reduce the manual entry of information and streamline activity.

2) AI will be able to assess data and understand emotion much more effectively. AI systems will be able to analyze calls and emails and support with the appropriate way to make the customer dialogue more successful.

3) CRMs will be able to evaluate themselves and improve the quality of data that they store. According to research by Dun & Bradstreet, 91% of data in CRM systems is incomplete, 18% is duplicated, and 70% is rendered stale each year (D&B, 2019). AI will improve the accuracy of the data within CRM systems filling incomplete files, removing duplicates, and eliminating dated and flawed information.

4) Fourthly, CRM systems will get much better in scoring leads. By analyzing millions of different historical and real-time attributes, including demographic data, firmographic data, geographic data, activity data, and web behavior AI-Enhanced systems will do a much better job determining customers' buying readiness.

5) CRM systems generally act as data storage centers or internal process systems. AI will allow CRM systems to become prescriptive, making clear recommendations and rationale behind those decisions (Fatemi, 2019).

### *9.6 Exploration of the AI Future – Shifts in Marketing Jobs*

Shifts in the advertising labor field will accompany the use of AI in every marketing channel. For basic jobs and entry-level jobs, there will be a movement towards automation. AI guru Kai-Fu Lee stated during a speech at Northwestern University, "The bottom 90 percent, especially the bottom 50 percent of the world in terms of income or education, will be badly hurt with job displacement...The simple question to ask is, 'How routine is a job?' And that is how likely [it is] a job will be replaced by AI, because AI can, within the routine task, learn to optimize itself. And the more quantitative, the more objective the job is—separating things into bins, washing dishes, picking fruits and answering customer service calls—those are very much scripted tasks that are repetitive and routine in nature. In the matter of five, 10 or 15 years, they will be displaced by AI (Thomas, 2019)."

An Oxford University study completed in 2017 asked 352 machine learning researchers on their beliefs about progress in AI. Researchers predict AI will outperform humans in many activities in the next ten years, such as translating languages (by 2024), writing high-school essays (by 2026), driving a truck (by 2027), working in retail (by 2031), writing a bestselling book (by 2049), and working as a surgeon (by 2053). Researchers believe there is a 50% chance of AI outperforming humans in all tasks in 45 years and of automating all human jobs in 120 years, with Asian respondents expecting these

dates much sooner than North Americans (Grace, Salvatier, Dafoe, Zhang, Evans, 2018).

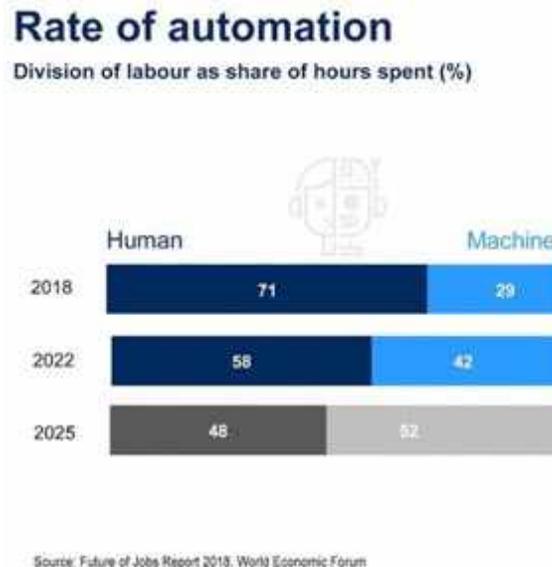
If there is a silver lining to the doom and gloom employment predictions it is that the marketing industry demands skills that AI does not do particularly well yet like creative thinking and understanding of cultural nuances. For these more strategic areas, AI will support and enhance human capabilities. As Lee puts it, AI will "amplify human creativity (Thomas, 2019)." Google X's founder Sebastian Thrun believes that AI will make people superhuman. Thrun states, "So, if you are a worker, say a medical doctor or a lawyer who spends day in and day out doing the same thing, then having AI look over your shoulder and learn those skills from you will make you a superhuman, a more powerful person (Galeon, 2018)."

### *9.7 Exploration of the AI Future – Building Bonds between AI and Humans*

The relationships that one has with machines may end up being as valuable as human bonds. Carlos Guestrin, the CEO and co-founder of Dato, a company that builds artificially intelligent systems to analyze data, envisions a world where real deep friendships connect humans and machines. Guestrin suggests, "I think what's going to be most profound is our impact, positive and negative but mostly positive, on the kind of almost symbiotic relationship between humans and technology (Del Prado, 2015)." The World Economic Forum's 2018 Future of Jobs Report highlights a possible progression as to why it is crucial to learn to partner with AI more effectively. In 2018, the WEF

found that 71% of labor is done by humans versus 29% completed by machines. This contrasts with a more balanced split by 2025 where one sees 48% of labor performed by humans versus 52% by machines (Chart 9.6) (World Economic Forum, 2018).

Chart 9.6: The Future of Work - Rate of Automation (World Economic Forum, 2018)



### 9.8 Exploration of the AI Future – New Jobs Created by AI and Upskilling

To be sure, AI will create new marketing jobs as well. The World Economic Forum predicts that AI machines and algorithms in the workplace are expected to create 133 million new roles. The downside is that they will also cause 75 million jobs to be displaced by 2022 (Leopold, Ratcheva, Zahidi, 2018).

To combat job displacement, the marketing industry will need to activate plans to upskill the advertising and media related workforce and look to Amazon and Google as partners in this process because they already have well-articulated schemes.

The concern is that the marketing industry appears to be doing the exact opposite. A study conducted by design and talent consultancy The Blueprint explored how agencies are responding to disruption through cost-cutting rather than business transformation. According to one interviewee, "The thinking and talent that get rewarded are the people that are status quo and make the leader look good. Not the people challenging convention and coming up with bold ideas. That's a fundamental challenge in the industry (Kemp, 2019)."

### *9.9 Exploration of the AI Future – A New Way of Living*

Indeed, AI will be a catalyst for change in all aspects of the marketing industry, but these shifts will be dwarfed by the changes in society at large. Advertising will have to transform to reflect the current zeitgeist of the age and capture new media opportunities.

Tech publication Built-In summarized the impact artificial intelligence will have on our lives.

Transportation: Although it could take a decade or more to perfect them, autonomous cars will one day ferry us from place to place.

**Manufacturing:** AI-powered robots work alongside humans to perform a limited range of tasks like assembly and stacking, and predictive analysis sensors keep equipment running smoothly.

**Healthcare:** In the comparatively AI-nascent field of healthcare, diseases are more quickly and accurately diagnosed, drug discovery is sped up and streamlined, virtual nursing assistants monitor patients, and big data analysis helps to create a more personalized patient experience.

**Education:** Textbooks are digitized with the help of AI, early-stage virtual tutors assist human instructors and facial analysis gauges the emotions of students to help determine who's struggling or bored and better tailor the experience to their individual needs.

**Media:** Journalism is harnessing AI, too, and will continue to benefit from it. Bloomberg uses Cyborg technology to help make quick sense of complex financial reports. The Associated Press employs the natural language abilities of Automated Insights to produce 3,700 earning reports stories per year — nearly four times more than in the recent past.

**Customer Service:** Last but hardly least, Google is working on an AI assistant that can place human-like calls to make appointments at, say, your neighborhood hair salon. In addition to words, the system understands context and nuance (Thomas, 2019).

AI will re-shape day to day life and may even go further and extend human life-expectancy as well. AI-enabled robotics will allow aging populations to maintain more

autonomy for longer. Toyota is investing heavily in AI-driven technologies to support the elderly. In 2015, the automaker spent a billion dollars to open its AI-focused Toyota Research Institute in Silicon Valley. Last year, it set up a \$100 million fund to invest in startups and new robotics technology. The Carmaker envisions a not-so-far-off future in which robots transcend the factory and become commonplace in homes, helping with chores — and even offering companionship — in an aging society where a quarter of the population is older than 65 and millions of seniors live alone (Buckland, 2019).

Futurists envision AI pushing even further in extending life expectancy. The Smithsonian explored what AI might do to the way people stay healthy. "AIs will work furiously to keep you healthy. Sensors in your home will constantly test your breath for early signs of cancer, and nanobots will swim through your bloodstream, consuming the plaque in your brain and dissolving blood clots before they can give you a stroke or a heart attack. Your Soulband (digital health monitor) will serve as a medical assistant on call 24/7. It will monitor your immune responses, your proteins, and metabolites, developing a long-range picture of your health that will give doctors a precise idea of what's happening inside your body. When you do become sick, your doctor will take your symptoms and match them up with many millions of cases stretching back. By 2065, AI has revolutionized the modification of our genomes. Scientists can edit human DNA the way an editor corrects a bad manuscript, snipping out the inferior sections and replacing them with strong, beneficial genes (Talty, 2018)."

AI will re-invent how we approach love. Dating has, for many, already gone digital.

There are almost 8000 dating sites in the world, 2500 in the US. These sites and apps include everything from Match, the first dating site ever, to Bristlr, a dating site for beard lovers that was founded in 2014 (Zwilling, 2013). The Statistic Brain Research Institute reports that more than 49.7 million Americans have tried online dating, and that's not far off from how many single people there are in the US: 54.4 million (Statistic Brain, 2018). The Smithsonian futurists push the current digital dating world into the AI-era imagining, "you are a woman in search of romance in this new world. You say, "Date," and your Soulband glows; the personal AI assistant embedded on the band begins to work. The night before, your empathetic AI scoured the cloud for three possible dates. Now your Soulband projects a hi-def hologram of each one. It recommends No. 2, a poetry-loving master plumber with a smoky gaze. Yes, you say, and the AI goes off to meet the man's avatar to decide on a restaurant and time for your real-life meeting. Perhaps your AI will also mention what kind of flowers you like, for future reference. After years of experience, you've found that your AI is actually better at choosing men than you. It predicted you'd be happier if you divorced your husband, which turned out to be true. Once you made the decision to leave him, your AI negotiated with your soon-to-be ex-husband's AI, wrote the divorce settlement, then "toured" a dozen apartments on the cloud before finding the right one for you to begin your single life (Talty, 2018)."

The near future offers an abundance of ways AI will support people to do elements of their jobs and the chores in their lives more efficiently. This support status receives many mentions in the thesis study results as respondents highlighted the many ways AI

can support them in their daily roles. However, one question that many wrestle with is how long this AI-support stage will last? Kurzweil and business leaders have foreshadowed that general artificial intelligence (AGI) is not so far off. Others argue that we have another 100 years before AI-led machines will be able to do more than humans.

### *9.10 Exploration of the AI Future – Timeline to General Artificial Intelligence*

The timeline for AGI remains a topic open for debate. There have been thirteen studies exploring the pathway to AGI. If one evaluates the results and collapses definitions of AI together, one uncovers several shared forecasts. Median estimates for when there will be a 10% chance of human-level AI are all in the 2020s (from seven surveys), except for the 2016 ESPAI, which found median estimates ranging from 2013 to long after 2066, depending on question framing. Median forecasts for when there will be a 50% chance of human-level AI range between 2035 and 2050 (from seven surveys), except for the 2016 ESPAI, which found median estimates ranging from 2056 to at least 2106, depending on question framing. Of the three studies in recent decades asking for predictions but not probabilities, two produced median estimates of when human-level AI will arrive in the 2050s and one in 2085 (Michie, 1972; Future of Humanity Institute, 2011; AI@50 Conference, 2006; AGI-09, 2009; Klein, 2007; Hanson, 2012; Kruegel, 2012; Bainbridge, 2005; Müller and Bostrom, 2011-12; ESPAI, 2016). A range of 50 to 100 years seems likely, which leaves today's marketing leaders in the clear. As futurist

Martin Ford says, "If you want to see a true thinking machine, eat your vegetables (Ford, 2018)."

There are many reasons why this AI future might not come so fast. Several leading thinkers and AI entrepreneurs, most notably, Elon Musk, warn about the potential pitfalls of AI. Speaking at the MIT Aeronautics and Astronautics department's Centennial Symposium in October 2014, Musk warned, "I think we should be very careful about artificial intelligence. If I were to guess like what our biggest existential threat is, it's probably that. So we need to be very careful with the artificial intelligence. Increasingly scientists think there should be some regulatory oversight maybe at the national and international level, just to make sure that we don't do something very foolish. With artificial intelligence we are summoning the demon. In all those stories where there's the guy with the pentagram and the holy water, it's like yeah he's sure he can control the demon. Didn't work out (McFarland, 2014)."

Regulatory pressure could slow AI progress. Europe's GDPR is levying significant fines for data misuse. British Airways and Marriott hotels paid penalties of 183 million and 99 million Euros respectively for failing to secure data protected under GDPR adequately. In the US, several states are about to roll-out or are assessing consumer data protections. California's Consumer Privacy Act (CCPA) goes into effect in January of 2020 followed by Maine in July 2020. Nevada's Internet Privacy act will pre-date California's going into effect on October 1st, 2019. Several other states like Pennsylvania, Massachusetts, Hawaii, New York, and Maryland are considering data

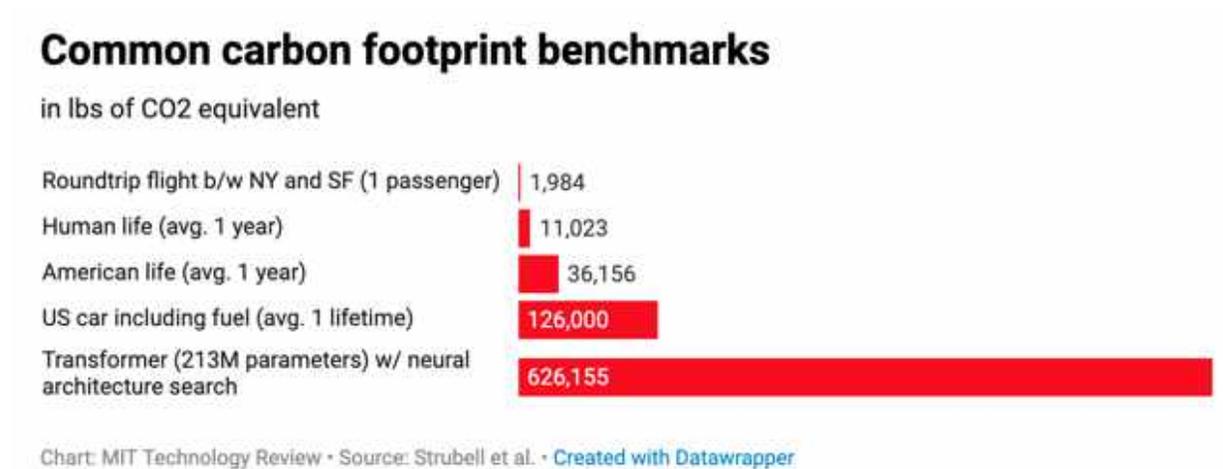
privacy regulation (Nicastro, 2019). Vermont already has data privacy regulation in place. Vermont, in 2018, enacted a law that requires data brokers to disclose to individuals which data is being collected and to permit them to opt-out of the collection (NCSL, 2019).

Company leaders are also raising the privacy alarm bells. Tim Cook, CEO of Apple, is positioning the Company as a champion of consumer data protection. Cook stated at a privacy conference in Belgium last autumn, "Advancing AI by collecting huge personal profiles is laziness, not efficiency. For artificial intelligence to be truly smart, it must respect human values, including privacy. If we get this wrong, the dangers are profound (Shead, 2018)."

However, regulations may not reflect consumer practice. Jonathan Obar and Anne Oeldorf-Hirsh discovered that consumers do not read privacy policies. Their paper explored the extent to which individuals ignored privacy policy and terms of service when joining a fictional social network. Results reveal that 74% of people skipped the privacy policy. A secondary finding was that even the ones that went through the motions of reading the policies were not reading them. If an adult with an average reading speed reviewed the privacy policies, it would have taken them 29-32 minutes. On average study, participants spent only 73 seconds reading the policies (Obar and Oeldorf-Hirsh, 2016).

Another potential impediment to AI's progress is the vast amounts of energy needed to run machine-learning systems. The carbon footprint for AI today is massive. In a paper from researchers at the University of Massachusetts, Amherst, the team found that training a single AI model can emit more than 626,000 pounds of carbon dioxide equal to nearly five times the lifetime emissions of the average car including the manufacture of the vehicle itself (Chart 9.7) (Strubell, Ganesh, McCallum, 2019).

Chart 9.7 Common carbon footprint benchmarks (Hao, 2019)



Leading AI academics such as Carlos Gómez-Rodríguez, a computer scientist at the University of A Coruña commented on the last findings, exclaiming, "While probably many of us have thought of this in an abstract, vague level, the figures really show the magnitude of the problem. Neither I nor other researchers I've discussed them with thought the environmental impact was that substantial (Hao, 2019)."

Not only could the carbon footprint issue slow down progress but, depending on the health of the economy, the investment capital needed may dry up. AI groups like

OpenAI require significant financial resources. The Company just received \$1 Billion from Microsoft. However, some are already calling into question the significant AI investments. Gary Marcus, founder, and CEO of Robust.AI and a professor of psychology and neural science at NYU wrote an article in Wired in August 2019, that challenged Alphabet (Google's parent company) on the losses its AI division DeepMind was accumulating. DeepMind lost over \$572 million in 2018 and has lost over \$1 billion in the past three years. Marcus' challenge is not necessarily about the amount of the investment but what it is being applied to and what is being neglected in the process. Marcus complains, "Every dollar invested in reinforcement learning is a dollar not invested somewhere else, at a time when, for example, insights from the human cognitive sciences might yield valuable clues (Marcus, 2019)."

### *9.11 Summary*

Even with the collection of potential restraints, the AI future is coming. The thesis and the supporting research do not show that marketers are embracing this future or are ready for it. Throughout this thesis, one has uncovered and highlighted trials of AI creative and new generative text and video systems. When looking towards the future one finds that the survey participants are aware of the macro themes but perhaps do not show activity in tactical or executional solutions to resolve the problems. The advertising and marketing community is not alone in its laggard status. All business verticals need to accelerate to benefit from the good of AI in the future and diminish the bad. AI research Max Tegmark summed this idea up nicely when he stated the AI future

for all of us could be great if we prepare. Tegmark said, "Most AGI researchers expect AGI within decades, and if we just bumble into this unprepared, it will probably be the biggest mistake in human history. It could enable brutal global dictatorship with unprecedented inequality, surveillance, suffering, and maybe even human extinction. But if we steer carefully, we could end up in a fantastic future where everybody's better off—the poor are richer, the rich are richer, everybody's healthy and free to live out their dreams (Thomas, 2019)."

## Chapter 10. Conclusion

A brave, new world for marketing powered by AI is just around the corner. Kurzweil predicted, "Artificial intelligence will reach human levels by around 2029. Follow that out further to, say, 2045, we will have multiplied the intelligence, the human biological machine intelligence of our civilization a billion-fold (Reedy, 2017)."

This mixed methodology thesis provides a snapshot of where the advertising and marketing community is in terms of its attitude, understanding, knowledge, and utilization of AI. The document explores the readiness of advertisers and marketers for an AI-enabled near future. It examines the risks marketers face in terms of the potential loss of employment and ethics.

One finds that today, marketers have limited knowledge but high expectations for AI balanced by a dose of fear of the unknown. There is a sense that creative, strategy, and leadership positions will proceed without effect. Experimental AI projects are underway,

and AdTech tool makers are testing early-stage AI support products. However, there appears to be no broader planning happening on the implications of AI in terms of organizational structure as well as training and upskilling employees. Based on the research study, the advertising industry finds itself squarely between expectation and experimentation. Survey respondents appear intrigued by the elements that need to be considered to scale AI. However, few practitioners implement the changes broadly. The survey shows that respondents, a representative sample of the ad industry, see AI as a disruptive force, but do not comprehend all the ways it will disrupt or why. There is fear of the unknown impacts that AI might have and a strong vein of belief in the human primacy to create and be strategic.

The first objective of the research was to understand the general level of understanding and knowledge of AI across the advertising and marketing industry. The research pressed on understanding the current level of AI expertise in the advertising industry. Part of the analysis and research probed on whether there was a common definition of AI for the marketing industry. The research uncovered that there was no standard definition for AI amongst marketers and seasoned scholars in AI also struggled to define the emerging space collectively. Also, the general understanding of AI amongst marketers was poor. Practitioners had no comprehension of the historical and technical underpinnings of the space.

The second objective of the thesis was to get a detailed sense of current marketing applications of AI and an idea of which tasks and roles AI could impact. One

evaluated survey respondent perspectives regarding the use of AI compared to the backdrop of actual AI marketing usage today. Participants in the research study expressed interest and topical awareness of AI but limited depth of knowledge or experience with related tools. These results stand in contrast to the AI product marketplace, where new machine-learning tools launch each day.

Creative sits as a central topic to this thesis. The third objective of this thesis explored the media and marketing industry's views of how truly creative AI could be in the context of advertising. The survey results show marketers confidently viewing humans as essential to creativity. One would argue that it would be foolish to think this human primacy will remain the case in the future considering the new AI creatively-focused tools. Advertising creatives are at an experimental and playful stage with AI. They try new machine-learning ideas, and they satirize the AI space. The systems and tools needed to support creatives to tackle more complex creative projects with AI are coming on the market. As these AI systems become intuitive, one can quickly imagine examples of creative solutions that have marketers playing less of a role crafting and more judging or evaluating the work. The opinions expressed in the survey about creativity and where the industry finds itself today are incongruent in terms of work and support systems. This discordance calls for more active AI education and developing a more collaborative human-AI partnership.

The fourth objective area of inquiry probed the impact on marketing employment.

Many studies explore the topic of employment and AI. The macro picture of AI's impact on work is bleak. This thesis evaluates the issue in the context of advertising and marketing and the results point to the perceived human primacy in areas such as marketing strategy, creative, and leadership. However, one's exploration of AI and the issue of employment reveal that there are many support components of these lateral-thinking areas that can be delivered effectively by AI today. In the immediate term, creative thinkers will remain in high demand.

The fifth objective of this thesis is to review the ethical priorities of marketers concerning AI. As awareness of AI increase in the marketing world, so does the concern about ethics. The research survey showed that data privacy (288 mentions) was a central ethical concern for respondents. Women were more concerned regarding ethical issues and some specific issues indexed the gender differences very clearly. Significant differences in ethical concerns were seen in Privacy of Data (66.6% for women, 58.9% for men), De-Skilling of the Workforce (40.5% of women vs. 30.5% of men), and Racial Bias (31.8% for women vs. 25.4% for men). While racial bias (131 mentions) and gender bias (128 mentions) received fewer clicks than data privacy, the background research on the industry highlighted them as important topics. Marketers appear supportive of more ethical AI solutions, but it is computer scientists that are leading the charge to date and setting the agenda.

The sixth objective for the thesis reviewed education and AI. One examined as to whether educational programs existed and if so, were such programs utilized by

marketing teams and organizations. Training in AI does not exist in the vast majority of companies where survey respondents worked. One finds that the marketing industry is not developing AI training at the accelerated pace of machine-learning development. No Amazon upskilling-like projects are happening in the advertising industry to date. Several groups offer free AI training online highlighting that there is no shortage of educational options at all price points. Marketers appear to know where to go to find training, yet; it seems not to be happening. AI learning today for a marketer remains optional.

The last objective of the thesis considered the future of AI and advertising. The thesis research results show ranges of reactions to the future of AI by marketers. Survey participants are excited but fearful, open to the possibilities but closed to the idea of a machine doing creative better than a human. Perhaps most importantly, marketers are aware that they are not ready for the change but do not appear to have a level of urgency to address the problem.

AI is everywhere in marketing. Advertising practitioners may not know it, but they use AI in their e-mails, social media posts, and smartphone chatbots. Machine-learning algorithms track customer data anomalies, improve customer experience, automate work processes, and provides predictive analysis. All customer support centers are AI-enhanced. Media planning and buying utilize AI for pattern recognition and better targeting. Creatives can employ tools to assist with copywriting and generative design to help with graphics. There are already thousands of start-ups, and skilled teams at

Facebook, Google, Microsoft, and Amazon working on AI fixes to communication and media challenges.

With all that is happening in AI, one finds it a bit concerning that a representative sample of marketers, as captured by thesis survey participants, are not more engaged with the field and the challenges it presents. Perhaps marketers are frozen by fear. A general unease lingers throughout the research responses in areas such as employment, ethics, and education. Practitioners have mild anxiety over potential job cuts, but the distress has not led to an actionable implementation of upskilling programs. Ethical considerations are top-of-mind for marketers, yet there is limited action outside of the tech giants regarding AI solutions for the flagged issues of data privacy and racial/gender bias. Education in AI is absent for marketers inside of agencies and marketing departments, but at the same time, there are several free and low-cost resources available online that only need coordination to be utilized.

The quantitative portion of the thesis research looked at age commonalities and differences. As is noted the over and under thirty year old cohorts have many commonalities. Their ratings of their understanding of AI are the same. Their definitions of AI and the challenge to choose one definition is the same. Both age groups rate AI's potential for creativity low. The majority of both age groups do not receive AI training at their place of employment. However, there were some key differences. The younger audience saw AI replacing many more work areas versus their older peers. An example of this disparity was seen in creative production applications where 27% of younger

respondents felt that AI could replace graphic design vs. 13% of the older group. Perhaps it is not surprise that the younger audience would be more concerned about the AI impact on employment. The younger cohort felt that Significant Job Losses (15.9% of the under 30 group vs. 11.6% of the over 30 group) was the most significant ethical concern. And finally, the attitude of the age groups towards AI differs dramatically. The Younger group are far more likely to feel Skeptical (17% of the under 30 group vs. 12% of the over 30 group), Cautious (19% of the under 30 group vs. 15% of the over 30 group) and even Anxious (8% of the under 30 group vs. 4% of the over 30 group). While these differences are not forthcoming in the qualitative review it will be important to track this generational divide.

Gender offered commonalities and nuanced differences. The two genders have consistent attitudes to the broader areas of the study, specifically their ratings of their understanding of AI are the same. Their definitions of AI and the challenge to choose one definition are the same. Both genders rate AI's potential for creativity low. The majority of both genders do not receive AI training at their place of employment. Both genders look to the same sources for further education in AI. In terms of differences, there was some notable level of disparity between genders on the issue of tasks that can be replaced by AI. The tasks they believed could not be replaced by AI were Video Editing (12.8% for women vs. 23.2% for men), Media Planning (21.8% for women vs. 31.5% for men) and Influencer Marketing (9.6% for women vs. 16.2% for men). Women have a higher level of concern regarding ethically related AI issues. Men were more likely to be less concerned overall with ethical challenges at an average of 35.8%

across all concerns, vs. women, who averaged 39.9% across all concerns. The ethical related gender differences regarding technology parallel findings from other technological studies. In a study published by the Emerson College and Blanquerna Center for Global Communications entitled *The Changing Face of Executive Reputation*, women are 25% more likely than men to make choices about which business leaders they choose to follow online on social media, based on an executive's standpoint – or lack of – on ethical and social issues (Breen, 2018).

When asked about what they need to know about AI in their current roles female respondents were more likely to identify Data Organization and Structure (46.9% for women vs. 35.3% for men), Security/Privacy Issues (40.8% for women vs. 30.2% for men), Predictive Messaging (44.1% for women vs. 33.5% for men) and Programmatic Advertising (44.8% for women vs. 35.7% for men). When asked which aspects of AI in marketing and advertising presents challenges and barriers to adoption, the female cohort saw that AI was “too risky” as being higher than the male cohort (21% for women vs. 15.8% for men), Investment/Budgetary Constraints (45% for women vs. 35% for men), IT Infrastructure (39% for women vs. 30% for men). The differences offer rich paths for further quantitative analysis and will also be interesting to track over time.

Many leading AI practitioners are cautiously optimistic about the future as long as we remember some basic principles. Kai-Fu Lee asks us to love and remember the attributes that bring humans together and infuse those ideals into the relationship with AI machines and the plans for programming AI tech. Daugherty asks for Humans and

Machines to work together and develop processes of collaboration where both man and machine can support one another and deliver optimal solutions. Andrew Ng, whose work has played a critical role in this last explosion of AI activity outlines his hopes, stating, "I would like the world to be fairer, I would like everyone to have better access to opportunities and education, I would like to relieve people of menial tasks, I would like democracy to run better. I really believe that with technology, we can remake large parts of the world to be much better than they are today. I wouldn't bother working so hard if I didn't fundamentally believe that (Vara, 2018)."

Ng's hope is a shared hope for the future of AI but to achieve this vision in marketing calls for an acceleration of activity. Industry agency groups are buying data companies like Acxiom, Epsilon, and Merkle, which is an important step but having this data expertise is only a half-step. Data thinking and predictive marketing thinking needs to be infused throughout the organization. Agencies and marketing departments must take a more holistic view of AI and re-think every part of the marketing department and advertising agency, including operational organization, upskilling, and adding new analytical skillsets.

AI is transformative and asks all marketing practitioners to think boldly. Never assume the primacy of humans but engage with AI as a partner and collaborator. Today, already the answer to the question of I think therefore I am is blurry. A thinking marketer plans for AI.

## Reference List

- Afiniti Corporation (2019). What We Do. Retrieved September 20, 2019, from <https://www.afiniti.com/what-we-do>
- AFP. (2018, October 19). Would You Welcome a Robot Into Your Home?. *Generation T*. Retrieved from <https://generationt.asia/ideas/increasingly-human-like-robots-spark-fascination-and-fear>
- Agrawal, A., Gans, J. & Goldfarb, A. (2018). *Prediction machines: the simple economics of artificial intelligence*, 117-123 [Kindle Edition]. Retrieved from Amazon.com
- AI Impacts (2015, October 1). AI Timeline Surveys. Retrieved from <https://aiimpacts.org/ai-timeline-surveys/>
- AI Index (2018). Annually Published AI Papers. Retrieved September 20, 2019, from <https://www.scopus.com/home.uri>
- Albert. (2019). Product. Retrieved September 20, 2019, from <https://albert.ai/ai-marketing-software/>
- Allen Institute for Artificial Intelligence (2019). GROVER-A State-of-the-Art Defense against Neural Fake News. Retrieved September 20, 2019, from <https://grover.allenai.org>
- Amazon. (2019) Upskilling 2025 [blog page]. Retrieved September 20, 2019, from [https://www.aboutamazon.com/working-at-amazon/upskilling-2025?utm\\_source=sem&utm\\_medium=g&utm\\_term=g07112019](https://www.aboutamazon.com/working-at-amazon/upskilling-2025?utm_source=sem&utm_medium=g&utm_term=g07112019)
- Ammerman, W. (2019). *The Invisible Brand: Marketing in the Age of Automation, Big Data, and Machine Learning*, 257-264 [Kindle Edition]. Retrieved from Amazon.com
- Arthur, R. (2016, June 27). VR, AI, Wearables and Data: Technology Wins Big at Cannes Lions. *Forbes*. Retrieved from <https://www.forbes.com/sites/rachelarthur/2016/06/27/vr-ai-wearables-and-data-technology-wins-big-at-cannes-lions/#466665b112fc>
- Ashford, W. (2019, August 1). GDPR taken more seriously after first fines. *Computer Weekly*. Retrieved from <https://www.computerweekly.com/news/252467726/GDPR-taken-more-seriously-after-first-fines>
- Aspen Institute. (2019). About UpSkill America. Retrieved 20 September, 2019, from <https://www.aspeninstitute.org/programs/upskill-america/about-upskill-america/>

Avdeeff, M. (2018, October 11). AI and humans collaborated to produce this hauntingly catchy pop music. *Quartz*. Retrieved from <https://qz.com/quartz/1420576/listen-to-haunting-ai-generated-pop-music-from-skygge-and-kiesza/>

Barbaschow, A. (2019, July 24). Microsoft and the learnings from its failed Tay artificial intelligence bot. *ZDNet*. Retrieved from <https://www.zdnet.com/article/microsoft-and-the-learnings-from-its-failed-tay-artificial-intelligence-bot/>

Barber, G. (2019, May 27). Deepfakes are getting better—but they're still easy to spot. *Ars Technica*. Retrieved from <https://arstechnica.com/information-technology/2019/05/deepfakes-are-getting-better-but-theyre-still-easy-to-spot/>

Barker, S. (2019, May 21). Future Digital Advertising: Artificial Intelligence & Advertising Fraud 2019-2023, The-Impact-of-AI-for-Digital-Advertisers [White paper pdf]. Retrieved from <https://www.juniperresearch.com/document-library/white-papers/the-impact-of-ai-for-digital-advertisers>

Baxter, K. (2018, August 28). Human Rights in the Fourth Industrial Revolution: Industry's role and responsibilities. *Medium*. Retrieved from <https://medium.com/salesforce-ux/human-rights-in-the-fourth-industrial-revolution-industrys-role-and-responsibilities-7aa07fbe255d>

BBC. (2016, March 12). Artificial intelligence: Google's AlphaGo beats Go master Lee Se-dol. Retrieved from <https://www.bbc.com/news/technology-35785875>

BBC. (2017, November 29). Robot automation will 'take 800 million jobs by 2030' – report. Retrieved from <https://www.bbc.com/news/world-us-canada-42170100>

Bellman, R. (1978). *Artificial Intelligence: Can Computers Think?*. San Francisco, CA: Boyd & Fraser Publishing Company.

Beltrone, G. (2019, March 5). ING and JWT Amsterdam Resurrect Rembrandt With an AI-Powered Voice Clone. *Adweek*. Retrieved from <https://www.adweek.com/creativity/ing-and-jwt-resurrect-rembrandt-with-an-ai-powered-voice-clone/>

Bizimungu, J. (2019, June 2). Global Media Forum: Can Artificial Intelligence truly be creative. *The New Times*. Retrieved from <https://www.newtimes.co.rw/news/global-media-forum-can-artificial-intelligence-truly-be-creative>

Boden, M. (2004). *The Creative Mind: Myths and Mechanisms* (p. 10). London, United-Kingdom: Routledge.

Bohn, D. (2019, January 4). Amazon Says 100 million Alexa devices have been sold-What's next?. *The Verge*. Retrieved from

<https://www.theverge.com/2019/1/4/18168565/amazon-alexa-devices-how-many-sold-number-100-million-dave-limp>

Bowen, P., Rose, R., Pilkington, A. (2017, May). Mixed Methods – Theory and Practice. Sequential, Explanatory Approach, European Centre for Research Training and Development UK. Retrieved from <http://www.eajournals.org/wp-content/uploads/Mixed-Methods-Theory-and-Practice.-Sequential-Explanatory-Approach.pdf>

Breen, B. (2016, November 2). AI in Marketing: Artificial Intelligence Technology Playing a Literal Role in the Advertising and Media Profession. Ad:Tech, Conference Presentation.

Breen, B. (2018, October). The Changing Face of Executive Reputation. Emerson-Blanquerna Center for Global Communication. Retrieved from <https://www.qnary.com/blog/2018/10/25/new-qnary-whitepaper-the-changing-face-of-executive-reputation>

Brenner, M. (2019, March 26). Disruption And Opportunity: Advanced Analytics, Automation, And AI In Digital Media. *D!igitalist Magazine*. Retrieved from <https://www.digitalistmag.com/customer-experience/2019/03/26/disruption-opportunity-advanced-analytics-automation-ai-in-digital-media-06197179>

Brewster, S. (2016, September 14). Uber Starts self-driving car pickups in Pittsburgh. *Tech Crunch*. Retrieved from <https://techcrunch.com/2016/09/14/1386711/>

Bughin, J., Hazan, E., Lund, S., Dahlström, P., Wiesinger, A., Subramian, A. (2018, May). Skill Shift Automation and The Future of the Workforce, McKinsey Global Institute [Discussion Paper pdf]. Retrieved from <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Future%20of%20Organizations/Skill%20Shift%20Automation%20and%20the%20future%20of%20the%20workforce/MGI-Skill-Shift-Automation-and-future-of-the-workforce-May-2018.ashx>

Bughin, J., Seong, J., Manyika, J., Chui, M., Joshi, R. (2018, September). Notes from the AI Frontier: Modeling the Impact of AI on the World Economy. *McKinsey & Company*. Retrieved from <https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy>

Bureau of Labor Statistics (2018). Fastest Growing Occupations [Data file]. Retrieved September 20, 2019, from <https://www.bls.gov/emp/tables/fastest-growing-occupations.htm>

CanalBlog (2012, June 23). Les androïdes rêvent-ils de tests de Turing ? Retrieved September 20, 2019, from <http://eljjdx.canalblog.com/archives/2012/06/23/24540311.html>

Caddy, B. (2019, August 13). Neuralink guide: How wearables will play their part in Elon Musk's brain tech. *Wearable*. Retrieved from <https://www.wearable.com/wearable-tech/neuralink-elon-musk-brain-wearable-guide-7487>

Cannes Lions. (2019). About. Retrieved September 20, 2019, from <https://www.canneslions.com/about>

Cartner-Morley, J. (2018, September 15). Do robots dream of Prada? How artificial intelligence is reprogramming fashion. *The Guardian*. Retrieved from <https://www.theguardian.com/fashion/2018/sep/15/do-robots-dream-of-prada-how-artificial-intelligence-is-reprogramming-fashion>

CB Insights. (2019, February 20). VCs Nearly Doubled Their Investment In This Tech Last Year. Retrieved from <https://www.cbinsights.com/research/artificial-intelligence-funding-venture-capital-2018/>

Charniak, E., McDermott, D. (1985). *Introduction to Artificial Intelligence*. Boston, MA: Addison-Wesley Longman Publishing Company.

Chavez, T., O'hara, C., Vaidya, V. (2018). *Data Driven: Harnessing Data and AI to Reinvent Customer Engagement* [Kindle Edition]. Retrieved from Amazon.com

Clark, L. (2012, June 26). Google's Artificial Brain Learns to find Cat Videos. *Wired*. Retrieved from <https://www.wired.com/2012/06/google-x-neural-network/>

Colby, C. (2019, August 12). Capital One data breach: What you can do now following bank hack. *CNET*. Retrieved from <https://www.cnet.com/how-to/capital-one-data-breach-what-you-can-do-now-following-bank-hack/>

Cope, D. (2019). Experiments in Musical Intelligence. Retrieved September 20, 2019, from <http://artsites.ucsc.edu/faculty/cope/experiments.htm>

Crevier, D. (1993). *AI: The Tumultuous Search for Artificial Intelligence*. New York, NY: Basic Books.

Daugherty, P.R., Wilson, H.J. (2018). *Human + Machine: Reimagining Work in the Age of AI*, Cambridge, MA: Harvard Review Press.

- Davies, J (2019, July 11). '2019 is the year of enforcement': GDPR fines have begun. *Digiday*. Retrieved from <https://digiday.com/media/2019-is-the-year-of-enforcement-gdpr-fines-have-begun/>
- Davis, J. (2018, August 31). How artificial intelligence models are taking over your Instagram feed. *Harper's Bazaar*. Retrieved from <https://www.harpersbazaar.com/uk/fashion/fashion-news/a22722480/how-artificial-intelligence-models-are-taking-over-your-instagram-feed/>
- Deakin, W. (2019). Real Intelligence. *VoxPops, The Drum*. The AI Guide [pdf file]. Retrieved from [https://ben.productplacement.com/wp-content/uploads/2019/05/The\\_DRUM\\_AI\\_Guide\\_2019.pdf](https://ben.productplacement.com/wp-content/uploads/2019/05/The_DRUM_AI_Guide_2019.pdf)
- Descartes, R. (2016). *Discourse on Method and Meditations on First Philosophy*. (Haldane, E. S., Trans.). Boston, MA: Digireads.com. (Original work published 1637)
- Desjardins, J. (2018, July 2). 10 skills you'll need to survive the rise of automation. *World Economic Forum*. Retrieved from <https://www.weforum.org/agenda/2018/07/the-skills-needed-to-survive-the-robot-invasion-of-the-workplace>
- Doland, A. (2016, June 6). Check Out the First Ad From McCann Japan's 'AI Creative Director'. *Adage*. Retrieved from <https://adage.com/article/creativity/check-commercial-mccann-japan-ai-creative-director/304320>
- Doland, A. (2016, August 31). McCann's AI creative director couldn't top a campaign by an actual human. *Adage*. Retrieved from <https://adage.com/article/agencies/mccann-s-ai-creative-director-top-a-campaign-a-human/305678>
- Donnelly, S. (2019, February). Skills of the Modern Marketer. *Econsultancy*. Retrieved from <https://econsultancy.com/reports/skills-of-the-modern-marketer/>
- Duggan, B. (2018, November 15). A Diversity Report for the Advertising/Marketing Industry - And A Call to Action. *ANA*. Retrieved from <https://www.ana.net/blogs/show/id/mm-blog-2018-11-ana-advertising-diversity-report>
- Duhigg, C. (2012, February 12). How companies Learn your secrets. *The New York Times*. Retrieved from <https://www.nytimes.com/2012/02/19/magazine/shopping-habits.html>
- Dun & Bradstreet, B2B Marketing (2018). Improve the Quality of your Marketing, now [pdf file]. Retrieved from <https://www.dnb.co.uk/content/dam/english/business-trends/b2bm-db-improve-the-quality-of-your-marketing-now-1-0.pdf>

Edmond, C. (2019, April 30). This AI just invented a new sport. *World Economic Forum*. Retrieved from <https://www.weforum.org/agenda/2019/04/artificial-intelligence-invented-sport-speedball/>

Engroff, J. (2018, October 11). Decoding AI's Technical Jargon. *Media Post*. Retrieved from <https://www.mediapost.com/publications/article/326395/decoding-ais-technical-jargon.html>

Etlinger, S. (2017, January 31). The Age of AI: How Artificial Intelligence Is Transforming Organizations. *Prophet*. Retrieved from <https://www.prophet.com/2017/01/artificial-intelligence-transforming-organizations/>

Evans, B. (2018, June 22). Ways to think about machine learning [blog post]. Retrieved from <https://www.ben-evans.com/benedictevans/2018/06/22/ways-to-think-about-machine-learning-8nefy>

Faull, J. (2019). Death to Creatives. *VoxPops, The Drum*. The AI Guide [pdf file]. Retrieved from [https://ben.productplacement.com/wp-content/uploads/2019/05/The\\_DRUM\\_AI\\_Guide\\_2019.pdf](https://ben.productplacement.com/wp-content/uploads/2019/05/The_DRUM_AI_Guide_2019.pdf)

Farland, M. (2014, October 24). Elon Musk: 'With artificial intelligence we are summoning the demon.'. *The Washington Post*. Retrieved from <https://www.washingtonpost.com/news/innovations/wp/2014/10/24/elon-musk-with-artificial-intelligence-we-are-summoning-the-demon/>

Fatemi, F. (2019, August 10). 5 Ways Artificial Intelligence Is Transforming CRMs. *Forbes*. Retrieved from <https://www.forbes.com/sites/falonfatemi/2019/08/10/5-ways-artificial-intelligence-is-transforming-crms/#779ccff65354>

- Fawkes, P. (2018, May 30). Interview: How Contextual User Experiences Are Optimizing Services. *PSFK*. Retrieved from <https://www.psfk.com/2018/05/rob-may-talla-nterview.html>
- Fay, S. (2017, March 17). AI: The Elephant in The Room. *Media Post*. Retrieved from <https://www.mediapost.com/publications/article/298166/ai-the-elephant-in-the-room.html>
- Fay, S. (2018, November 29). What The Universal Guidelines For AI Mean for Marketers, *Media Post*. Retrieved from <https://www.mediapost.com/publications/article/328668/what-the-universal-guidelines-for-ai-mean-for-mark.html>
- Fingas, J. (2018, April 15). AI creates 'Flintstones' cartoons from text descriptions. *Engadget*. Retrieved from <https://www.engadget.com/2018/04/15/ai-creates-flintstones-cartoons/>
- Flinders, K. (2019, July 3). One-third of people prefer instant reply from chatbot about finances to waiting for human reply. *Computer Weekly*. Retrieved from <https://www.computerweekly.com/news/252466206/One-third-of-people-prefer-instant-reply-from-chatbot-about-finances-to-waiting-for-human-reply>
- Forrester Research – Albert. (2019). Webinar – Harnessing AI's Potential [video file]. Retrieved 20 September, 2019, from <https://albert.ai/events/webcast-harnessing-ai-potential-confirmation/>
- Ford, M. (2018). *Architects of Intelligence: The truth about AI from the people building it*. Birmingham, United-Kingdom: Packt Publishing.
- Frey, C. B., Osborn, M. A. (2013, September 17). The Future of Employment: How susceptible are jobs to computerisation? [pdf file]. Retrieved from [https://www.oxfordmartin.ox.ac.uk/downloads/academic/The\\_Future\\_of\\_Employment.pdf](https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf)
- Friedman, L. (2015, July 2). A machine is about to do to cancer treatment what 'Deep Blue' did to Garry Kasparov in chess. Retrieved from <https://www.businessinsider.com/how-ibm-watson-is-transforming-healthcare-2015-7>
- Frost, L., Barzic, G. (2019, April 14). Publicis is buying data firm Epsilon for \$4.4 billion to push further into digital marketing. *Business Insider*. Retrieved from <https://www.businessinsider.com/publicis-pays-44-billion-for-epsilon-to-extend-digital-reach-2019-4>

- Future of Privacy Forum (2017, December 11). Unfairness By Algorithm: Distilling the Harms of Automated Decision-Making. Retrieved from <https://fpf.org/2017/12/11/unfairness-by-algorithm-distilling-the-harms-of-automated-decision-making/>
- Galeon, D. (2018, February 12). AI Will Give Rise to “Superhuman Workers”, Says Google X Co-Founder. *Futurism*. Retrieved from <https://futurism.com/superhuman-workers-ai-sebastian-thurn>, Futurism
- Gartner (2019). The present and future of AI [webinar pdf file]. Retrieved from <https://www.gartner.com/en/webinars/25341/the-present-and-future-of-ai>
- Gartner (2019) Gartner Hype Cycle. Retrieved from <https://www.gartner.com/en/research/methodologies/gartner-hype-cycle>
- Gillespie, P. (2017, May 26). Mark Zuckerberg supports universal basic income. What is it?. *CNN Business*. Retrieved from <https://money.cnn.com/2017/05/26/news/economy/mark-zuckerberg-universal-basic-income/index.html>
- Glickman, M., Brown, J., Song, R. (2019, June 22). *Data in life: Authorship Attribution in Lennon-McCartney Songs*. DOI 10.1162/99608f92.130f856e
- Google AI. (2019). Artificial Intelligence at Google: Our Principles. Retrieved September 20, 2019, from <https://ai.google/principles>
- Google AI. (2019). Artificial Intelligence at Google: Our Principles. Retrieved September 20, 2019, from <https://ai.google/education>
- Going, G. (2018, April 30). Rob Norman, Former Chief Digital Officer of WPP’s GroupM, To Join Albert Board of Directors. Retrieved from <https://albert.ai/news/rob-norman-former-chief-digital-officer-of-wpps-groupm-to-join-albert-board-of-directors-2/>
- Goldhill, O. (2016, September 24). The First Pop Song Ever Written by Artificial Intelligence is Pretty Good Actually. *Quartz*. Retrieved from <https://qz.com/790523/daddys-car-the-first-song-ever-written-by-artificial-intelligence-is-actually-pretty-good/>
- Grace, K., Salvatier, J., Dafoe, A., Zhang, B., Evans, O. (2018, May 3). When Will AI Exceed Human Performance? Evidence from AI Experts [pdf file]. Retrieved from [Arxiv.org/pdf/1705.08807.pdf](https://arxiv.org/pdf/1705.08807.pdf)
- Gray, A. (2016, January 16). The 10 skills you need to thrive in the Fourth Industrial Revolution. *World Economic Forum*. Retrieved from <https://www.weforum.org/agenda/2016/01/the-10-skills-you-need-to-thrive-in-the-fourth-industrial-revolution/>

Greene, T. (2018, September 28). Burger King trolls artificial intelligence with new ads. *TNW*. Retrieved from <https://thenextweb.com/artificial-intelligence/2018/09/28/burger-king-trolls-artificial-intelligence-with-new-ads/>

Griner, D. (2018, September 27). Burger King Mocks the Creative Power of AI With These Wonderfully Ridiculous Commercials. *Adweek*. Retrieved from <https://www.adweek.com/creativity/burger-king-mocks-the-creative-power-of-ai-with-these-wonderfully-ridiculous-commercials/>

Griner, D. (2018, November 19). An AI Tried to Write the Perfect Lexus Ad. Here's a Scene-by-Scene Look at What It Was Thinking. *Adweek*. Retrieved from <https://www.adweek.com/programmatic/an-ai-tried-to-write-the-perfect-lexus-ad-heres-a-scene-by-scene-look-at-what-it-was-thinking/>

Groopman, J. (2018, September 21). How Investing in AI is About Investing in People, Not Just Technology. *Entrepreneur*. Retrieved from <https://www.entrepreneur.com/article/320422>

Grothaus, M. (2019, May 28). Now AI easily erases the Tiananmen Square massacre from online memory. *Fast Company*. Retrieved from <https://www.fastcompany.com/90355806/now-ai-easily-erases-the-tiananmen-square-massacre-from-online-memory>

Guttmann, A. (2019, August 9). Advertising spending in the world's largest ad markets in 2018 (in billion U.S. Dollars) [data file]. Retrieved from <https://www.statista.com/statistics/273736/advertising-expenditure-in-the-worlds-largest-ad-markets/>

Half, R. (2018, July 10). The importance of upskilling your employees. Retrieved from <https://www.roberthalf.com/blog/management-tips/the-importance-of-upskilling-your-employees>

Hardawar, D. (2015, May 15). IBM's big bet on Watson is paying off with more apps and DNA analysis. *Engadget*. Retrieved from <https://www.engadget.com/2015/05/05/ibm-watson-apps-dna/>

Hao, K. (2019, June 6). Training a single AI model can emit as much carbon as five cars in their lifetimes. *MIT Technology Review*. Retrieved from <https://www.technologyreview.com/s/613630/training-a-single-ai-model-can-emit-as-much-carbon-as-five-cars-in-their-lifetimes/>

Hawking, S. (2018). *Brief Answers to the Big Questions*. New York, NY: Penguin Random House.

House, B. (2017, December 17). Nielsen AI recognized as one of most technologically significant new products of 2017. Retrieved from <https://www.nielsen.com/us/en/press-releases/2017/nielsen-ai-recognized-a-one-of-most-technologically-significant-products-of-2017/>

IBM. (2019). Project Debater. Retrieved September 20, 2019, from <https://www.research.ibm.com/artificial-intelligence/project-debater/>

IEEE Global History Network, Institute of Electrical and Electronics Engineers (1991, July 25). Oral History: Bertram Raphael. Retrieved from [https://ethw.org/Oral-History:Bertram\\_Raphael](https://ethw.org/Oral-History:Bertram_Raphael)

ING. (2017). The Next Rembrandt. Retrieved September 20, 2019, from <https://www.nextrembrandt.com/>

Instagram. (2019) @lilmiquela. Retrieved September 20, 2019 from Instagram

Ironpaper. (2016, November 15). Top 10 Skills Needed by Marketers Today. Retrieved from <https://www.ironpaper.com/webintel/articles/top-10-skills-needed-by-marketers-today/>

Jercinovic, J. (2017, June 26). The Ethics of using AI in Advertising. *AdAge*. Retrieved from <https://adage.com/article/digitalnext/ethics-ai-advertising/309535>

Jerde, S. (2019, June 18). NBCUniversal Is Beta-Testing a New AI Ad Offering to Reach Consumers in the Proper Context. *Adweek*. Retrieved from <https://www.adweek.com/tv-video/nbcuniversal-is-beta-testing-a-new-ai-ad-offering-to-reach-consumers-in-the-proper-context/>

Johnson, K. (2019, May 6). Microsoft rolls out AI and robotics toolkit in limited preview. *Venture Beat*. Retrieved from <https://venturebeat.com/2019/05/06/microsoft-rolls-out-ai-and-robotics-toolkit-in-limited-preview/>

- Johnson, L. (2017, May 2017). Saatchi LA Trained IBM Watson to Write Thousands of Ads for Toyota. *Adweek*. Retrieved from <https://www.adweek.com/digital/saatchi-la-trained-ibm-watson-to-write-thousands-of-ads-for-toyota/>
- Kator, A. (2019, March 28). Enhancing Call Center Efficiency with AI. *No Jitter*. Retrieved from <https://www.nojitter.com/contact-center-customer-experience/enhancing-call-center-efficiency-ai>
- Kemp, N. (2019, January 24). The ad industry's broken business model is breaking talent. *Campaign*. Retrieved from <https://www.campaignlive.com/article/ad-industrys-broken-business-model-breaking-talent/1523740>
- Khandelwal, P. (2018, November 8). Jobs of the future: Top 5 skills that won't be replaced by AI. *E27*. Retrieved from <https://e27.co/jobs-of-the-future-top-5-skills-that-wont-be-replaced-by-ai-20181108/>
- Kieff, C. (2019, May). Bant Bren post-research study interview.
- Knoblauch, M. (2014, April 23). Internet users send 204 million emails per minute. *Mashable*. Retrieved from <https://mashable.com/2014/04/23/data-online-every-minute/>
- Kottenstette, R. (2018, March 15). Silicon Valley Companies are undermining the impact of artificial intelligence. *Tech Crunch*. Retrieved from <https://techcrunch.com/2018/03/15/silicon-valley-companies-are-undermining-the-impact-of-artificial-intelligence/>
- Kulp, P. (2019, May 31). New AI Can Detect Fake News With Unprecedented Accuracy—and Generate Its Own. *Adweek*. Retrieved from <https://www.adweek.com/digital/new-ai-can-detect-fake-news-with-unprecedented-accuracy-and-generate-its-own/>
- Kumar, R., Baul, S. (2018, February). Digital-Out-Of-Home (DOOH) Market Overview. Retrieved from <https://www.alliedmarketresearch.com/digital-out-of-home-doooh-market>
- Kurzweil, R. (1990). *The Age of Intelligent Machines*. Cambridge, MA: MIT Press.
- Kurzweil, R. (2005). *The Singularity is Near: When Humans Transcend Biology*. New York, NY: Viking Press.
- Le, QV., Ranzato, M'A., Rajat, M., Devin, M., Chen, K., Corrado, G. S., Dean, J., Ng, A. Y. (2012, July 12). Building High-level Features Using Large Scale Unsupervised Learning [pdf file]. Retrieved from <https://arxiv.org/abs/1112.6209>

Lecher, C. (2019, July 24). Facebook will have to monitor its own privacy rules — and that's likely not enough. *The Verge*. Retrieved from <https://www.theverge.com/2019/7/24/20708809/facebook-privacy-ftc-order-settlement-monitor-behavior>

Lee, K-F. (2018). *AI Superpowers: China, Silicon Valley and the new World Order*. Boston, MA: Houghton Mifflin Harcourt.

Lepitak, S. (2019, June 12). Publicis Groupe's Marcel 3.0 – 'A lot of people want to get their hands on it'. *The Drum*. Retrieved from <https://www.thedrum.com/news/2019/06/12/publicis-groupe-s-marcel-30-lot-people-want-get-their-hands-it>

Liffreing, I. (2018, November 19). Confessions of a data Scientist: 'Marketers don't know what they're asking for'. *Digiday*. Retrieved from <https://digiday.com/marketing/confessions-data-scientist-marketers-dont-know-theyre-asking/>

LinkedIn. (2018, December 13). LinkedIn's 2018 U.S. Emerging Jobs Report. Retrieved from <https://economicgraph.linkedin.com/research/linkedin-2018-emerging-jobs-report>

Litmus. (2015). Email Marketing in 2020. Retrieved from <https://litmus.com/lp/email-marketing-in-2020>

Loechner, J. (2018, September 7). Will Ai kill jobs?. *Media Post*. Retrieved from <https://www.mediapost.com/publications/article/324515/will-ai-kill-jobs.html>

Löfwander, S. (2017, January 24). About Artificial Intelligence, Neural Networks & Deep Learning. Retrieved from <https://www.ayima.com/blog/artificial-intelligence-neural-networks-deep-learning.html>

Lozano-Pérez, T., Wesley, M. A. (1979). *An algorithm for planning collision-free paths among polyhedral obstacles*. <http://dx.doi.org/10.1145/359156.359164>

Luger, G. F, Stubblefield, W. A. (1993). *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*. Redwood City, CA: Benjamin-Cummings Pub.

Lum, E. (2017, September). Talent Disconnect: Charting the Pathways to Future Growth [pdf file]. The ANA Educational Foundation. Retrieved from <https://www.aef.com/wp-content/uploads/2017/09/talent-2017study-v2.pdf>

Lynch D. (2014, July 7). Google CEO Larry Page Wants A Shorter Workweek For Everyone. *IBT*. Retrieved from <https://www.ibtimes.com/google-ceo-larry-page-wants-shorter-workweek-everyone-1621466>

Mandese, J. (2019, April 9). Google-Backed Study Finds People Willing To Trade Sensitive Data For Personalized Media. *Media Post*. Retrieved from

<https://www.mediapost.com/publications/article/334272/google-backed-study-finds-people-willing-to-trade.html>

Marr, B. (2018, December 31). The Most Amazing Artificial Intelligence Milestones So Far. *Forbes*. Retrieved from <https://www.forbes.com/sites/bernardmarr/2018/12/31/the-most-amazing-artificial-intelligence-milestones-so-far/#6776a0547753>

Marcus, G. (2019, August 14). DeepMind's Losses and the Future of Artificial Intelligence. *Wired*. Retrieved from <https://www.wired.com/story/deepminds-losses-future-artificial-intelligence/>

Marketing Artificial Intelligence Institute (2019) .Conference and Content Hub About Us. Retrieved September 20, 2019, from <https://www.marketingaiinstitute.com/about-us>

Marr, B. (2016, January 6). The Rise Of Thinking Machines: How IBM's Watson Takes On The World. Retrieved from <https://www.forbes.com/sites/bernardmarr/2016/01/06/the-rise-of-thinking-machines-how-ibms-watson-takes-on-the-world/#7b6519551e43>

Marr, B. (2017, September 18). The Amazing Ways Coca Cola Uses Artificial Intelligence And Big Data To Drive Success. *Forbes*. Retrieved from <https://www.forbes.com/sites/bernardmarr/2017/09/18/the-amazing-ways-coca-cola-uses-artificial-intelligence-ai-and-big-data-to-drive-success/#11a9cc7478d2>

Marr, B. (2018, May 30). The Amazing Ways Samsung Is Using Big Data, Artificial Intelligence And Robots To Drive Performance. *Forbes*. Retrieved from <https://www.forbes.com/sites/bernardmarr/2018/05/30/the-amazing-ways-samsung-is-using-big-data-artificial-intelligence-and-robots-to-drive-performance/#4fea78c82b8d>

Marsh, S. (2019, May 31). David Cameron takes job with US artificial intelligence firm. *The Guardian*. Retrieved from <https://www.theguardian.com/politics/2019/may/31/david-cameron-takes-job-with-us-artificial-intelligence-firm>

Martin, C. (2017, January 15). L'Occitane Adds AI-Based Website Alerts. *Media Post*. Retrieved from <https://www.mediapost.com/publications/article/330604/loccitane-adds-ai-based-website-alerts.html>  
Martin, C. (2018, October 1). Artificial Intelligence Still In Early Days. *Media Post*. Retrieved from <https://www.mediapost.com/publications/article/325871/artificial-intelligence-still-in-early-days.html>

Martin, C. (2019, March 19). AI moving into Customer Service. *Media Post*. <https://www.mediapost.com/publications/article/333343/ai-moving-into-customer-service.html>

Martinez, J. (2018, November 28). No Bullsh\*t advice from Email experts. Retrieved from <https://blog.kickbox.com/tag/no-bullsht-advice-from-email-experts/>

Matney, L. (2019, January 4). More than 100 million Alexa Devices have been sold. *Tech Crunch*. Retrieved from <https://techcrunch.com/2019/01/04/more-than-100-million-alexa-devices-have-been-sold/>

May, R. (2017, January 25). What Will The Natural Language Technology Stack Look Like in 5 Years?. Retrieved from <https://medium.com/pillar-companies/what-will-the-natural-language-technology-stack-look-like-in-5-years-ed36bb54a3f>

McCann Worldgroup (2019) Press Release. Retrieved June 11, 2019, from <https://www.prnewswire.com/news-releases/mccann-worldgroup-and-wired-to-debut-ai-documentary-series-at-cannes-festival-300865199.html>

McCarthy, J., Minsky, M. L., Rochester, N., Shannon, C. E. (2006). *A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence*. (Original work published August 31, 1955). <https://doi.org/10.1609/aimag.v27i4.1904>

McCarthy, J. (2016, April 7). How a Microsoft machine learning AI created this entirely new Rembrandt. *The Drum*. Retrieved from <https://www.thedrum.com/news/2016/04/07/how-microsoft-machine-learning-ai-created-entirely-new-rembrandt>

McClurg, J. (2019, August 7). AI Ethics Guidelines Every CIO Should Read. *Information Week*. Retrieved from <https://www.informationweek.com/big-data/ai-machine-learning/ai-ethics-guidelines-every-cio-should-read/a/d-id/1335346>

McFarland, M. (2018, October 12). Magic Leap's new AI assistant looks alarmingly human. Retrieved from <https://www.cnn.com/2018/10/12/tech/magic-leap-ai-assistant/index.html>

Mcgee, M. (2016, August 8). Dentsu Aegis acquires Merkle in deal estimated at \$ 1.5 billion. Retrieved from <https://marketingland.com/dentsu-aegis-acquires-merkle-deal-estimated-1-5-billion-187499>

McKesson, D. (2016, March 24). @deray. *Twitter*. Retrieved from [https://twitter.com/deray/status/713028398898089984?ref\\_src=twsrc%5Etfw%7Ctwcamp%5Etweetembed%7Ctwterm%5E713028398898089984&ref\\_url=http%3A%2F%2Ficetulip.com%2Fblog%2Fmicrosofts-chatbot-tay-just-went-on-a-racist-misogynistic-anti-semitic-tirade%2F](https://twitter.com/deray/status/713028398898089984?ref_src=twsrc%5Etfw%7Ctwcamp%5Etweetembed%7Ctwterm%5E713028398898089984&ref_url=http%3A%2F%2Ficetulip.com%2Fblog%2Fmicrosofts-chatbot-tay-just-went-on-a-racist-misogynistic-anti-semitic-tirade%2F)

McNeal, M. (2014, November 20). How 4 Companies Find and Create Value from Open Data. Retrieved from <https://blogs.oracle.com/marketingcloud/4-companies-find-create-value-open-data>

Meeker, M. (2019, June 11). Internet Trends 2019. Retrieved from <https://www.bondcap.com/report/itr19/#view/1>

- Menabrea, L. (1842). *Sketch of the Analytical Engine invented by Charles Babbage Esq.* (Lovelace, A., Trans.). London, United-Kingdom: Taylor and Francis.
- Metz, R. (2018, March 26). Adobe bets that AI tools can foster real creativity. *Technology Review*. Retrieved from <https://www.technologyreview.com/s/610625/adobe-bets-that-ai-tools-can-foster-real-creativity/>
- Metz, C. (2019, July 13). Facial Recognition Tech Is Growing Stronger, Thanks to Your Face. *The New York Times*. Retrieved from <https://www.nytimes.com/2019/07/13/technology/databases-faces-facial-recognition-technology.html>
- Metz, C. (2019, July 22). With \$1 Billion From Microsoft, an A.I. Lab Wants to Mimic the Brain. *The New York Times*. Retrieved from <https://www.nytimes.com/2019/07/22/technology/open-ai-microsoft.html>
- Miller, C. C. (2017, January 12). A Darker Theme in Obama's Farewell: Automation Can Divide Us. *The New York Times*. Retrieved from <https://www.nytimes.com/2017/01/12/upshot/in-obamas-farewell-a-warning-on-automations-perils.html>
- Miller, P. (2011, January 13). IBM's Watson supercomputer destroys all humans in Jeopardy practice round. *Engadget*. Retrieved from <https://www.engadget.com/2011/01/13/ibms-watson-supercomputer-destroys-all-humans-in-jeopardy-pract/>
- Mirman, E. (2018, June 27). Robots are our friends- How artificial Intelligence is leveling up marketing. *Entrepreneur*. Retrieved from <https://www.entrepreneur.com/article/315808>
- Mix (2017, January 5). Google secretly squared off its AI against leading Go players and it won by a landslide. *The Next Web*. Retrieved from <https://thenextweb.com/google/2017/01/05/google-alpha-go-victory/>
- Monllos, K. (2019, August 5). 1 year in, IPG attributes growth and new business wins to Acxiom acquisition. *Digiday*. Retrieved from <https://digiday.com/marketing/one-year-ipg-attributes-growth-new-business-wins-acxiom-acquisition/>
- National Conference of State Legislatures (2019, August 13). Consumer Data Privacy Legislation. Retrieved from <http://www.ncsl.org/research/telecommunications-and-information-technology/consumer-data-privacy.aspx>

Nedelkoska, L., Quintini, G. (2018). *Automation, skills use and training*, OECD Social, Employment and Migration Working Papers, No. 202. <https://doi.org/10.1787/1815199X>

Ng, A. (2018, December 13). AI Transformation playbook how to lead your company into the AI era. Retrieved from <https://landing.ai/ai-transformation-playbook/>

Nguyen, I., Gorenberg, M. (2018, August 18). The AI-first startup playbook. *Venture Beat*. Retrieved from <https://venturebeat.com/2018/08/18/the-ai-first-startup-playbook/>

Nicastro, D. (2019, August 30). Examining Where 8 US States Stand on Consumer Data Privacy Laws. *CMS WIRE*. Retrieved from <https://www.cmswire.com/customer-experience/examining-where-eight-us-states-stand-on-consumer-data-privacy-laws/>

Nielsen (2019). Nielsen AI. Retrieved September 20, 2019, from <https://www.nielsen.com/us/en/>

Noyes, K. (2016, April 7). AI just 3D printed a brand-new Rembrandt, and it's shockingly good. *PC World*. Retrieved from <https://www.pcworld.com/article/3053520/ai-just-3d-printed-a-brand-new-rembrandt-and-its-shockingly-good.html>

Obar, J. A., Oeldorf-Hirsch, A. (2016, August 24). The Biggest Lie on the Internet: Ignoring the Privacy Policies and Terms of Service Policies of Social Networking Services, The 44th Research Conference on Communication, Information and Internet Policy. Retrieved from [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2757465](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2757465)

Octane.ai (2019). Company Information. Retrieved September 20, 2019, from <https://octaneai.com/>

Oleinik, A. (2019, April 9). What are neural networks not good at? On artificial creativity. <https://doi.org/10.1177/2053951719839433>

Olenski, S. (2018, March 6). Data Science Is The Key To Marketing ROI - Here's How To Nail It. *Forbes*. Retrieved from <https://www.forbes.com/sites/steveolenski/2018/03/06/data-science-is-the-key-to-marketing-roi-heres-how-to-nail-it/#39452bf431c3>

Oliveira, L. De (2017, February 11). Fueling the Gold Rush: The Greatest Public Datasets for AI. Retrieved from <https://medium.com/startup-grind/fueling-the-ai-gold-rush-7ae438505bc2>

Olson, P. (2018, October 3). A Two-Minute Guide To Artificial Intelligence. *Forbes*. Retrieved from <https://www.forbes.com/sites/parmyolson/2018/10/03/a-two-minute-guide-to-artificial-intelligence/#66969ea461c0>

OpenAI (2019). Company Information. Retrieved from <https://openai.com/>

Ota, K. (2019, January 15). Toyota hopes robots can be helpers in aging Japanese society. *The Denver Post*. Retrieved from <https://www.denverpost.com/2019/01/15/japan-robots-toyota-elderly-help/>

Palmer, S. (2019, February 3). AI Won't Take Your Job, People Will, Retrieved from <https://www.shellypalmer.com/2019/02/ai-wont-take-job-people-will/>

Pariser, E. (2011, May). *The Filter Bubble: How the New Personalized Web Is Changing What We Read and How We Think..* London, United-Kingdom: Penguin Press.

Peachey, K. (2019, July 15). New face of the Bank of England's £50 note is revealed as Alan Turing. Retrieved from <https://www.bbc.com/news/business-48962557>

Peccarelli, B. (2019, January 14). AI isn't taking our jobs - but it is changing how we recruit. *World Economic Forum*. Retrieved from <https://www.weforum.org/agenda/2019/01/ai-is-changing-the-way-we-recruit/>

Perisic, I. (2018, September 17). How artificial intelligence is shaking up the job market. *World Economic Forum*. Retrieved from <https://www.weforum.org/agenda/2018/09/artificial-intelligence-shaking-up-job-market/>

Pickard, J., Bradshaw, T. (2019, May 31). David Cameron takes new job with AI company. *Financial Times*. Retrieved from <https://www.ft.com/content/d083a192-839f-11e9-b592-5fe435b57a3b>

Pieters, R., Winiger, S. (2016, May 7). Creative AI: On the Democratisation & Escalation of Creativity. *Medium*. Retrieved from <https://medium.com/@creativeai/creativeai-9d4b2346faf3>

Prado, G. M. Del (2015, October 26). 18 artificial intelligence researchers reveal the profound changes coming to our lives. *Business Insider*. Retrieved from <https://www.businessinsider.com/researchers-predictions-future-artificial-intelligence-2015-10>

Price, J. (2018, October 28) .AI-Generated Portrait Sells for over \$400K. *Complex*. Retrieved from <https://www.complex.com/life/2018/10/ai-generated-portrait-sells-for-400k>

Privacy: personal information: businesses. Assembly Bill No. 375. Retrieved September 20, 2019, from California Legislative Information website [https://leginfo.ca.gov/faces/billTextClient.xhtml?bill\\_id=201720180AB375](https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB375)

- Radacati Group (2019, January). Forecast number of mobile devices worldwide from 2019 to 2023 [data file]. Retrieved from <https://www.statista.com/statistics/245501/multiple-mobile-device-ownership-worldwide/>
- Ray, T. (2018, December 13). Andrew Ng sees and eternal springtime for AI. *ZDNet*. Retrieved from <https://www.zdnet.com/article/andrew-ng-sees-an-eternal-springtime-for-ai/>, 13 December 2018
- Reddy, S. (2018, August 17). Conversational Artificial Intelligence- The final Phase of information Revolution. *Forbes*. Retrieved from <https://www.forbes.com/sites/forbestechcouncil/2018/08/17/conversational-artificial-intelligence-the-final-phase-of-the-information-revolution/#36bf17a07de8>
- Reedy, C. (2017, October 5). Kurzweil Claims That the Singularity Will Happen by 2045. *Futurism*. Retrieved from <https://futurism.com/kurzweil-claims-that-the-singularity-will-happen-by-2045>
- Reese, H. (2016, March 24). Why Microsoft's 'Tay' AI bot went wrong. *TechRepublic*. Retrieved from <https://www.techrepublic.com/article/why-microsofts-tay-ai-bot-went-wrong/>
- Reinsel, D., Gantz, J., Rydning, J. (2018, November). The Digitization of the World: From Edge to Core [White paper pdf]. Retrieved from <https://www.seagate.com/files/www-content/our-story/trends/files/idc-seagate-dataage-whitepaper.pdf>
- Reker, A. (2019, May). Bant Breen Post-Thesis Survey Interview.
- Reynolds, M. (2017, May 23). DeepMind's AI beats world's best Go player in latest face-off. Retrieved from <https://www.newscientist.com/article/2132086-deepminds-ai-beats-worlds-best-go-player-in-latest-face-off/#ixzz62rVEVD5h>
- Rich, E., Knight, K. (1991) *Artificial Intelligence*. New York, NY: McGraw-Hill.
- RLA Academy (2018, October 5). Dartmouth Workshop: The Birthplace Of AI. Retrieved from <https://medium.com/rla-academy/dartmouth-workshop-the-birthplace-of-ai-34c533afe992>
- Rodgers, C. (2017, May 15). The big debate: Is coding a must-have skill for marketers?. *Marketing Week*. Retrieved from <https://www.marketingweek.com/the-big-debate-marketers-coding/>
- Roose, K. (2019, June 23). A Machine May Not Take Your Job, but One Could Become Your Boss. *The New York Times*. Retrieved from <https://www.nytimes.com/2019/06/23/technology/artificial-intelligence-ai-workplace.html>

Rouse, M. (2013, October). Gartner Hype Cycle. Retrieved from <https://whatis.techtarget.com/definition/Gartner-hype-cycle>

Rouse, M. (2019, June). Turing Test. Retrieved from <https://searchenterprisearch.techtarget.com/definition/Turing-test>

Russell, S. J., Norvig, P. (2003). *Artificial Intelligence: A Modern Approach* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.

Ryan, J. (2017, April 4). Nielsen Dives into AI. Retrieved from <https://adexchanger.com/platforms/nielsen-dives-ai/>

Sachs, J. (2017). *Building the New Economy: Smart, Fair and Sustainable*. New York, NY: Columbia University Press.

Samadi, F. (2018, July 3). IPG acquires Acxiom for \$2.3 bn. Retrieved from <https://www.campaignlive.co.uk/article/ipg-acquires-acxiom-23bn/1486810>

Schalkoff, R. J. (1990). *Artificial Intelligence Engine*. New York, NY: McGraw-Hill.

Schoonenboom, J., Johnson, R. Burke (2017, July 5) How to Construct a Mixed Methods Research Design. PubMed Central. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5602001/>

Schultz, R. (2019, May 22). AI, Oh Why? Forrester Reports On What Brands Are Doing Wrong. *Media Post*. Retrieved from <https://www.mediapost.com/publications/article/336166/ai-oh-why-forrester-reports-on-what-brands-are-d.html>

Schultz, R. (2019, June 6). Consumers Remain Wary Of Artificial Intelligence, Study Shows. *Media Post*. Retrieved from <https://www.mediapost.com/publications/article/336719/consumers-remain-wary-of-artificial-intelligence.html>

Schwab, K. (2019, April 25). 3 reasons why AI will never match human creativity. *Fast Company*. Retrieved from <https://www.fastcompany.com/90339590/3-reasons-why-ai-will-never-match-human-creativity>

Schwab, K. (2015, December 12)., The Fourth Industrial Revolution. *Foreign Affairs*. Retrieved from <https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution>

Shahbazi, R. (2018, May 10). Google using Artificial intelligence to simple, Necessary Tasks. Retrieved from <https://miami.cbslocal.com/2018/05/10/google-artificial-intelligence-help-tasks/>

Shead, S. (2018, October 24). Apple CEO Tim Cook Issues AI Warning: 'It Must Respect Human Values, Including Privacy'. *Forbes*. Retrieved from <https://www.forbes.com/sites/samshead/2018/10/24/apple-ceo-tim-cook-issues-ai-warning-it-must-respect-human-values-including-privacy/#72900d6584d4>

Shoham, Y., Perrault, R., Brynjolfsson, E., Clark, J., Manyika, J., Niebles, J. C., Lyons, T., Etchemendy, J., Grosz, B., Bauer, Z. (2018, December). *The AI Index 2018 Annual Report*, AI Index Steering Committee, Human-Centered AI Initiative, Stanford University, Stanford, CA.

Simonite, T. (2016, April 11). How Computers Can Tell What They're Looking At: Images from inside an artificial neural network help explain why a technique called deep learning is enabling software to see. *Technology Review*. Retrieved from <https://www.technologyreview.com/s/601118/how-computers-can-tell-what-theyre-looking-at/>

Simonite, T. (2018, August 17). AI Is the Future—But Where Are the Women?. *Wired*. Retrieved from <https://www.wired.com/story/artificial-intelligence-researchers-gender-imbalance/>

Simpson, M. (2018, October 5). Machine Learning vs Neural Networks: Why It's Not One or the Other. Retrieved from <https://www.verypossible.com/blog/machine-learning-vs.-neural-networks>

Sinnott, N. (2018, April 25). How Machine learning is changing the world and your everyday life. *Entrepreneur*. Retrieved from <https://www.entrepreneur.com/article/312016>

Smith, D. , Burke, B. (2019, August 6). *Hype Cycle for Emerging Technologies, 2019*. Retrieved from <https://www.gartner.com/en/documents/3956015/hype-cycle-for-emerging-technologies-2019>

Solomonoff, R. J. (1985). The Time Scale of Artificial Intelligence. Reflections on Social Effects. *Human Systems Management*, Vol. 5, no. 2, pp. 149-153. doi:10.3233/HSM-1985-5207

Sorek, I. (2017, March 17). Using Machine Learning To Fuel An AI-Powered Renaissance For Agencies. *Forbes*. Retrieved from <https://www.forbes.com/sites/forbesagencycouncil/2017/03/15/using-machine-learning-to-fuel-an-ai-powered-renaissance-for-agencies/#4aecbdede63e>

Spangler, T. (2018, November 19). First AI-Scripted Commercial Debuts, Directed by Kevin Macdonald for Lexus (Watch). *Variety*. Retrieved from <https://variety.com/2018/digital/news/lexus-ai-scripted-ad-ibm-watson-kevin-macdonald-1203030693/>

- SRI International (2019). Shakey the Robot. Retrieved September 20, 2019, from <https://www.sri.com/work/publications/shakey-robot>,  
<https://www.sri.com/sites/default/files/uploads/publications/pdf/629.pdf>
- Statt, N. (2019, April 4). Google dissolves AI ethics board just one week after forming it. *The Verge*. Retrieved from <https://www.theverge.com/2019/4/4/18296113/google-ai-ethics-board-ends-controversy-kay-coles-james-heritage-foundation>
- Sterne, J. (2017). *Artificial Intelligence for Marketing*. Hoboken, NJ: Wiley and SAS Business Series.
- Sterne, J. (2019, May 21). Bant Breen Interview for Thesis.
- Strubell, E., Ganesh, A., McCallum, A. (2019, June 5). Energy and Policy Considerations for Deep Learning. Retrieved from <https://arxiv.org/abs/1906.02243>
- SurveyMonkey (2019). <https://www.surveymonkey.com/>
- Talty, S. (2018, April). What will our society look like when artificial intelligence is everywhere. *Smithsonian*. Retrieved from <https://www.smithsonianmag.com/innovation/artificial-intelligence-future-scenarios-180968403/>
- Taulli, T. (2018, November 24). What to expect for AI in 2019. *Forbes*. Retrieved from <https://www.forbes.com/sites/tomtaulli/2018/11/24/what-to-expect-for-ai-artificial-intelligence-in-2019/#1f814a7957b1>
- TeachThought (2018, September 16). 10 Roles for Artificial Intelligence in Education. Retrieved from <https://www.teachthought.com/the-future-of-learning/10-roles-for-artificial-intelligence-in-education/>
- Terdiman, D. (2018, October 5). How AI is helping Amazon become a trillion-dollar company. *Fast Company*. Retrieved from <https://www.fastcompany.com/90246028/how-ai-is-helping-amazon-become-a-trillion-dollar-company>
- Terry, H. P., Hulsing, J., Grant, M., Powell, D., Piyush, M., Waqar, S. (2016, November 14). Artificial Intelligence: AI, Machine Learning and Data Fuel the Future of Productivity [pdf file]. Retrieved from <http://www.smallake.kr/wp-content/uploads/2017/05/P020161223538320477062.pdf>
- Thomas, M. (2019, August 1). The Future of Artificial Intelligence. Retrieved from <https://builtin.com/artificial-intelligence/artificial-intelligence-future>

Toppo, G. (2018, November 2). Connecting Data Science to 'Almost Every Domain of Inquiry. *Inside Higher ED*. Retrieved from <https://www.insidehighered.com/news/2018/11/02/big-data-ai-prompt-major-expansions-uc-berkeley-and-mit>

Torres, M. (2018, October 24). Survey: Creatives are not worried about AI taking their jobs. Retrieved from <https://www.theladders.com/career-advice/survey-creatives-are-not-worried-about-ai-taking-their-jobs>

Trott, J. (2018, November 22). AI's going to be your new work buddy? Marry your washing machine, while you're at it. *The Drum*. Retrieved from <https://www.thedrum.com/opinion/2018/11/22/ais-going-be-your-new-work-buddy-marry-your-washing-machine-while-you-re-it>

Trunomi, Commvault (2019). The EU General Data Protection Regulation (GDPR) is the most important change in data privacy regulation in 20 years. Retrieved September 20, 2019, from EGDPR.ORG

Turing, A.M. (1950) .*Computing Machinery and Intelligence*. Oxford, United-Kingdom: Oxford University Press on behalf of the Mind Association.

Tuttle, K. (2013, April 30). Free from the start. Retrieved September 20, 2019 from <https://www.symmetrymagazine.org/article/april-2013/free-from-the-start?page=15>

Unemyr, M., Wass, M. (2018). *Data-Driven Marketing with Artificial Intelligence: Harness the Power of Predictive Marketing and Machine Learning*. Independently published.

US Bureau of Labor of Statistics (2014). Retrieved September 20, 2019, from <https://www.bls.gov/opub/mlr/2014/>

US Bureau of Labor of Statistics (2016). Retrieved September 20, 2019, from <https://www.bls.gov/opub/mlr/2016/>

Usher, S. (2016). *Letters of Note: Volume 2: An Eclectic Collection of Correspondence Deserving of a Wider Audience*. London, United-Kingdom: Canongate.

UN Department of Economic and Social Affairs (2019). *World Population Prospects 2019*, United Nations Publications. Retrieved July 2019, from <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>

Vara, V. (2017, October 6). Q&A: Andrew Ng, the Authority on A.I.. *Fortune*. Retrieved from <https://fortune.com/2018/10/06/andrew-ng-artificial-intelligence-authority/>

Vellino, A. (1986). *Artificial intelligence: The very idea*. Cambridge, MA: MIT Press.

Venture Scanner (2017, April 27). Venture Investing in Artificial Intelligence. Retrieved from <https://www.venturescanner.com/blog/tags/venture%20scanner%20ai>

Vigeant, F. (2016, November 2). KnowAtom Interview with iRobot CEO Colin Angle, Retrieved from <https://www.knowatom.com/blog/knowatom-interview-with-irobot-ceo-colin-angle>

Vincent, J. (2017, September 4). Putin says the nation that leads in AI 'will be the ruler of the world'. *The Verge*. Retrieved from <https://www.theverge.com/2017/9/4/16251226/russia-ai-putin-rule-the-world>

Vincent, J. (2019, May 17). This AI-generated Joe Rogan fake has to be heard to be believed. *The Verge*. Retrieved from <https://www.theverge.com/2019/5/17/18629024/joe-rogan-ai-fake-voice-clone-deepfake-dessa>

Vincent, J. (2019, July 2). Endless AI-generated spam risks clogging up Google's search results. *The Verge*. Retrieved from <https://www.theverge.com/2019/7/2/19063562/ai-text-generation-spam-marketing-seo-fractl-grover-google>

Vincent, J. (2019, July 3). Facebook's image outage reveals how the company's AI tags your photos. *The Verge*. Retrieved from <https://www.theverge.com/2019/7/3/20681231/facebook-outage-image-tags-captions-ai-machine-learning-revealed>

Voss, P. (2019, February 25). Beyond Chatbots: Hyper-Personalized, Intelligent Assistants. *Forbes*. Retrieved from <https://www.forbes.com/sites/cognitiveworld/2019/02/25/beyond-chatbots-hyper-personalized-intelligent-assistants/#622af5bd2aba>

Walker, C., Baxter, J. (2019, April 12). Method Sequence and Dominance in Mixed Methods Research: A Case Study of the Social Acceptance of Wind Energy Literature. *International Journal of Qualitative Methods*. Retrieved from <https://journals.sagepub.com/doi/full/10.1177/1609406919834379>

Wang, P. (2008). *What Do You Mean by 'AI'?* In: Artificial General Intelligence, 2008: Proceedings of the First AGI Conference (Vol. 171). IOS Press.

Wharton, University of Pennsylvania (2017, November 7). Why AI Is the 'New Electricity'. Retrieved from <https://knowledge.wharton.upenn.edu/article/ai-new-electricity/>

Wharton, University of Pennsylvania (2018, November 29). How AI Can Help Small Business Solve Big Problems. Retrieved from

<https://knowledge.wharton.upenn.edu/article/ai-can-help-small-business-solve-big-problems/>

Whit, A. (2018). *Build the AI business Case* [E-reader version]. Retrieved from <https://www.gartner.com/en/information-technology/insights/artificial-intelligence/ai-business-case>

White, C. (2016, March 8). Email Marketing in 2020 [eBook]. Retrieved from <https://litmus.com/blog/email-marketing-in-2020-20-experts-share-their-vision-of-emails-future-ebook>

Whittaker, Z. (2019, August 13). Facebook transcribed users' audio message without permission. *Tech Crunch*. Retrieved from <https://techcrunch.com/2019/08/13/facebook-contractors-said-to-have-collected-and-transcribed-users-audio-without-permission/>

Wiggers, K. (2019, May 23). Chick-fil-A's AI can spot signs of foodborne illness from social media posts with 78% accuracy. *Venture Beat*. Retrieved from <https://venturebeat.com/2019/05/23/chick-fil-as-ai-can-spot-signs-of-foodborne-illness-from-social-media-posts-with-78-accuracy/>

Wiggers, K. (2019, July 19). DeepMind's AI learns to generate realistic videos by watching YouTube clips. *Venture Beat*. Retrieved from <https://venturebeat.com/2019/07/19/deepminds-ai-learns-to-generate-realistic-videos-by-watching-youtube-clips/>

Williams, C. (2019). *VoxPops, The Drum*. The AI Guide [pdf file]. Retrieved from [https://ben.productplacement.com/wp-content/uploads/2019/05/The\\_DRUM\\_AI\\_Guide\\_2019.pdf](https://ben.productplacement.com/wp-content/uploads/2019/05/The_DRUM_AI_Guide_2019.pdf)

Wilson, H. J., Daugherty, R. P. (2018, August). Collaborative Intelligence : Humans and AI are joining forces. *Harvard Business Review*. Retrieved from <https://hbr.org/2018/07/collaborative-intelligence-humans-and-ai-are-joining-forces>

Winston, P. H. (1992). *Artificial Intelligence* (3rd ed.). Boston, MA: Addison-Wesley.

Wohl, J. (2018, November 23). ANA Moves Ahead with Educational Program to Prep New Generation of Industry Players. *AdAge*. Retrieved from <https://adage.com/article/cmo-strategy/ana-moves-ahead-program-prepare-a-generation-industry-players/315653>

Wong, J. C. (2018, March 22). Mark Zuckerberg apologises for Facebook's 'mistakes' over Cambridge Analytica. *The Guardian*. Retrieved from <https://www.theguardian.com/technology/2018/mar/21/mark-zuckerberg-response-facebook-cambridge-analytica>

World Economic Forum (2016, January). The Future of Jobs Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution [pdf file]. Retrieved from [http://www3.weforum.org/docs/WEF\\_Future\\_of\\_Jobs.pdf](http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf)

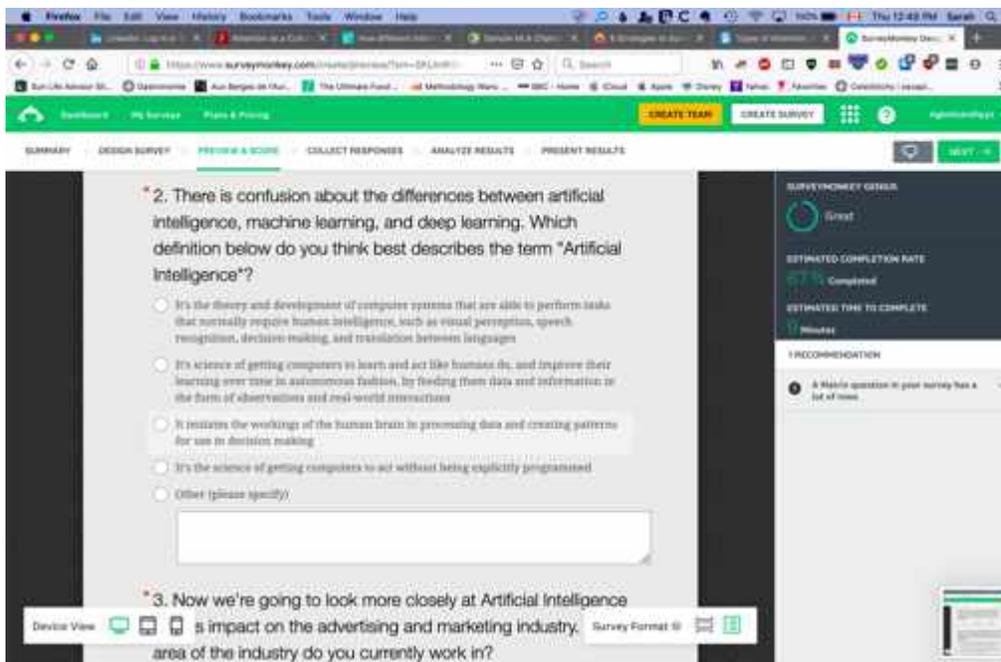
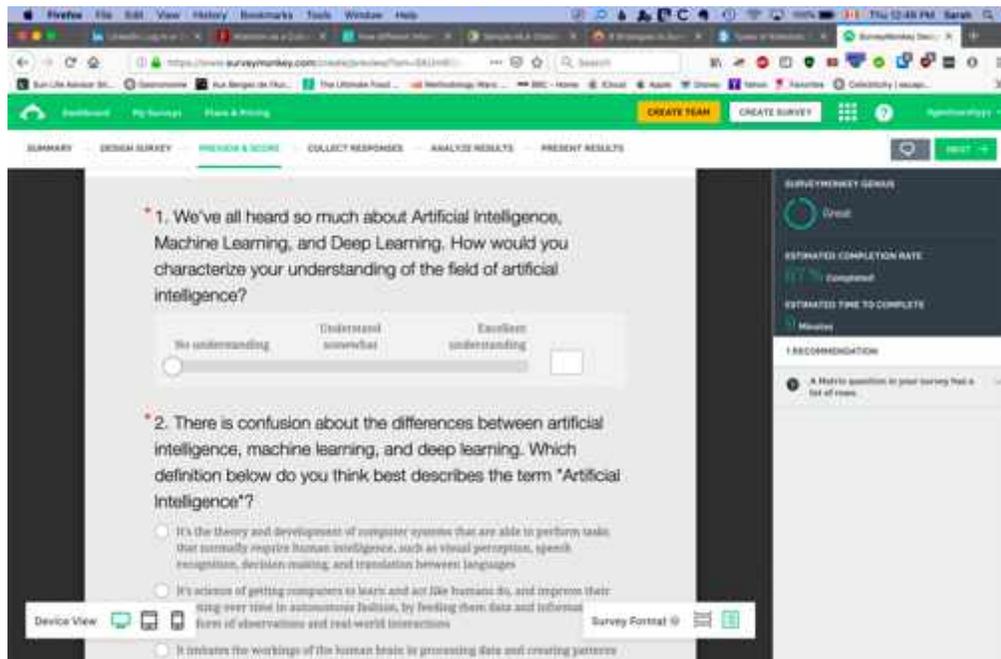
World Economic Forum (2018). The Future of Jobs Report. Retrieved from <https://www.weforum.org/reports/the-future-of-jobs-report-2018>

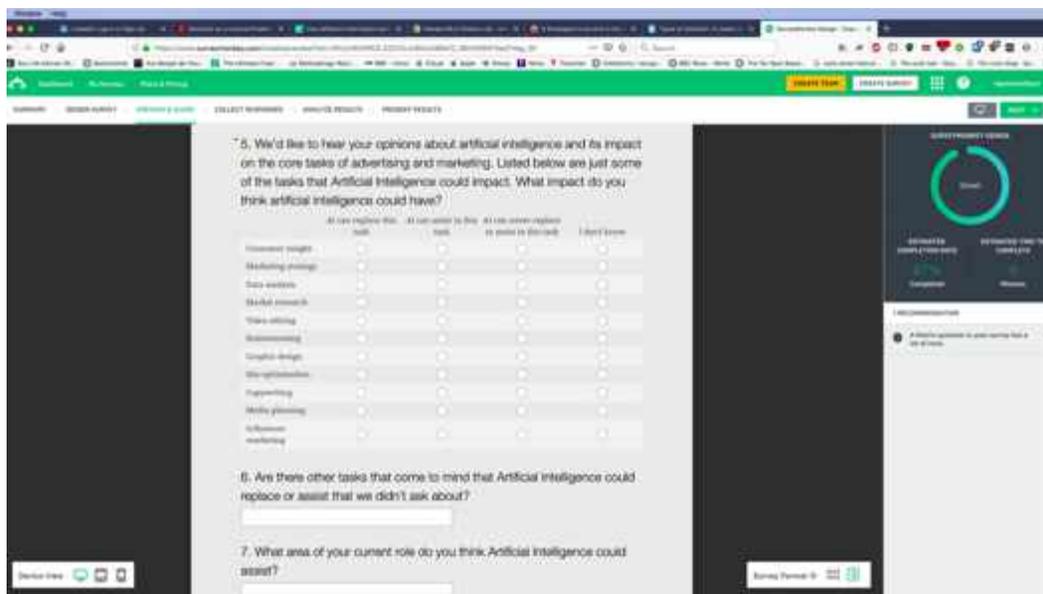
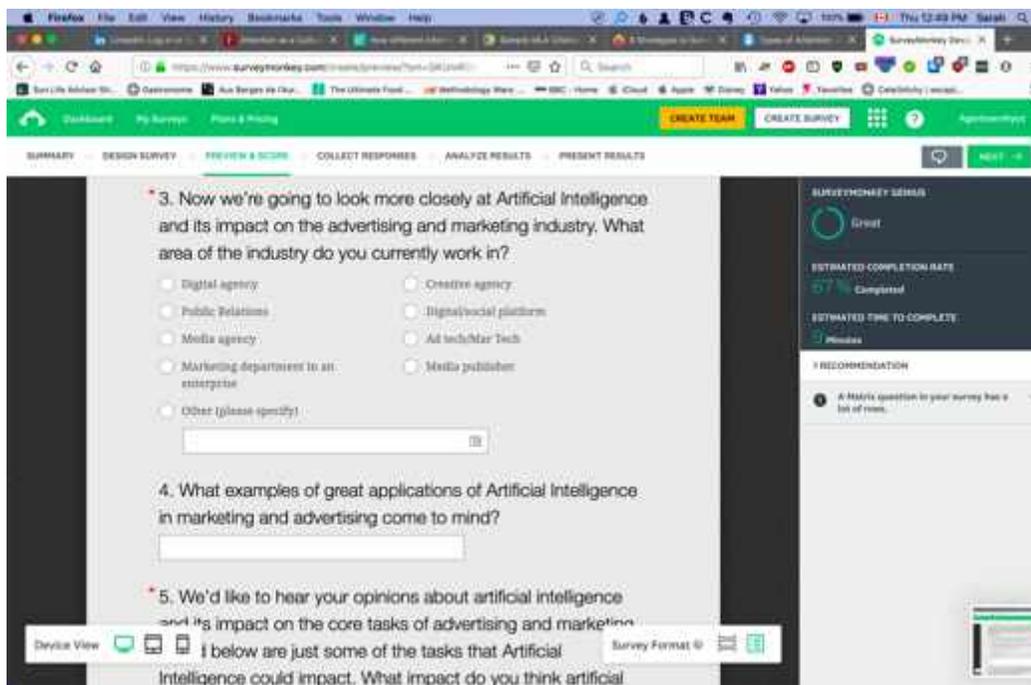
Yanardag, P., Cebrian, M., Rahwan, I. (2017). *Human-AI collaborated horror stories*. Retrieved September 20, 2019, from Shelley.ai

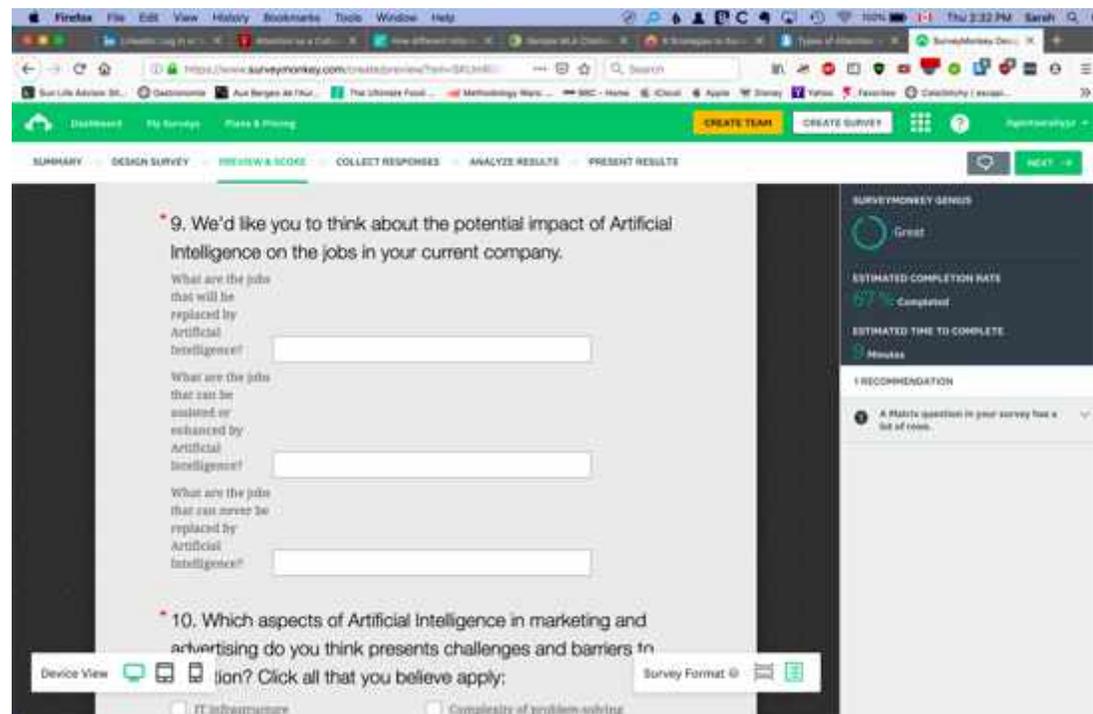
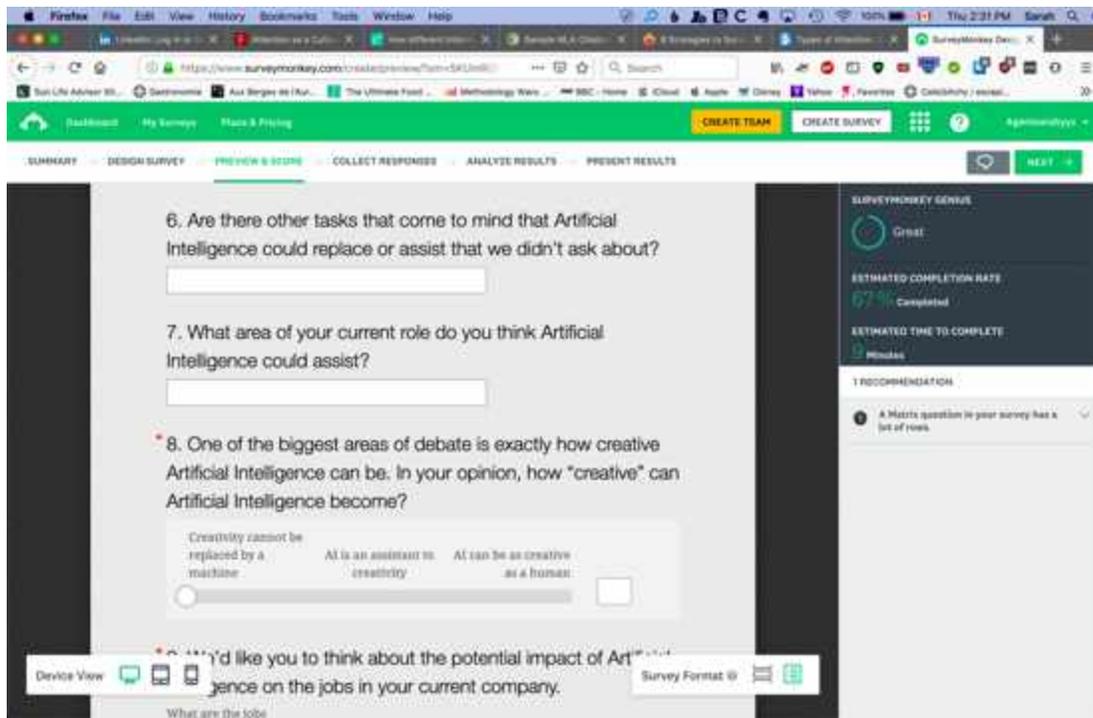
Yoshino, J. (2017, September 6). Voice-interface assistants compete for smart appliances. *Nikkei Asian Review*. Retrieved from <https://asia.nikkei.com/Business/Biotechnology/Voice-interface-assistants-compete-for-smart-appliances>

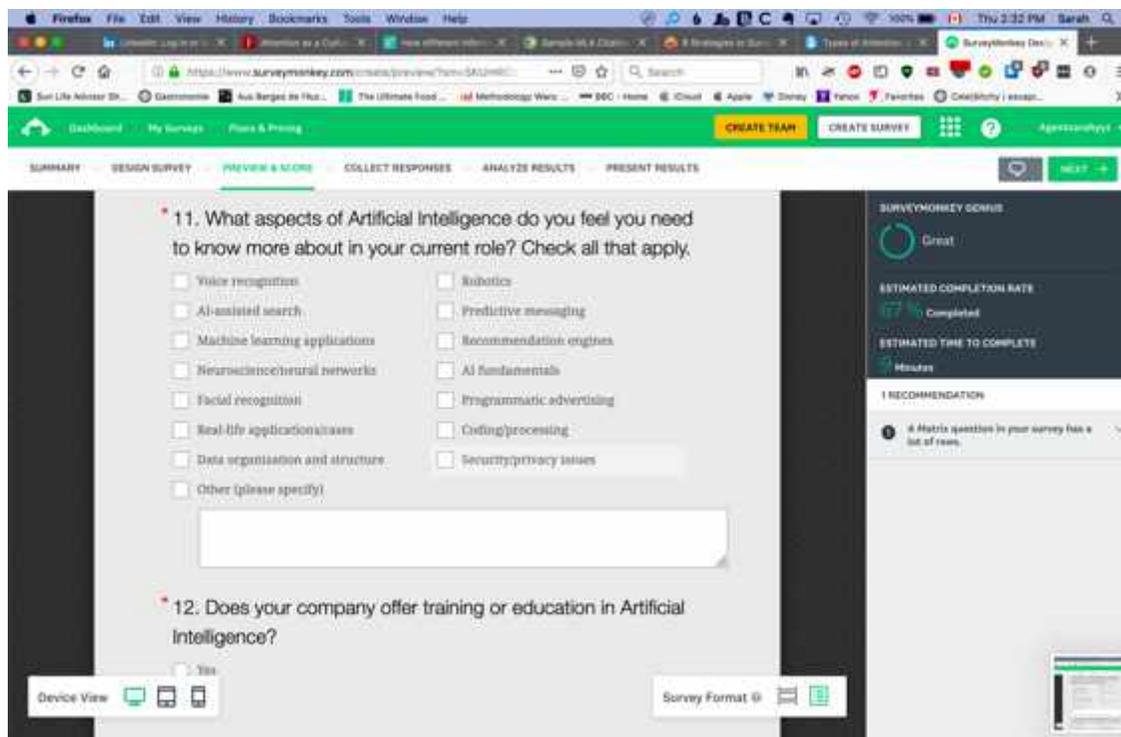
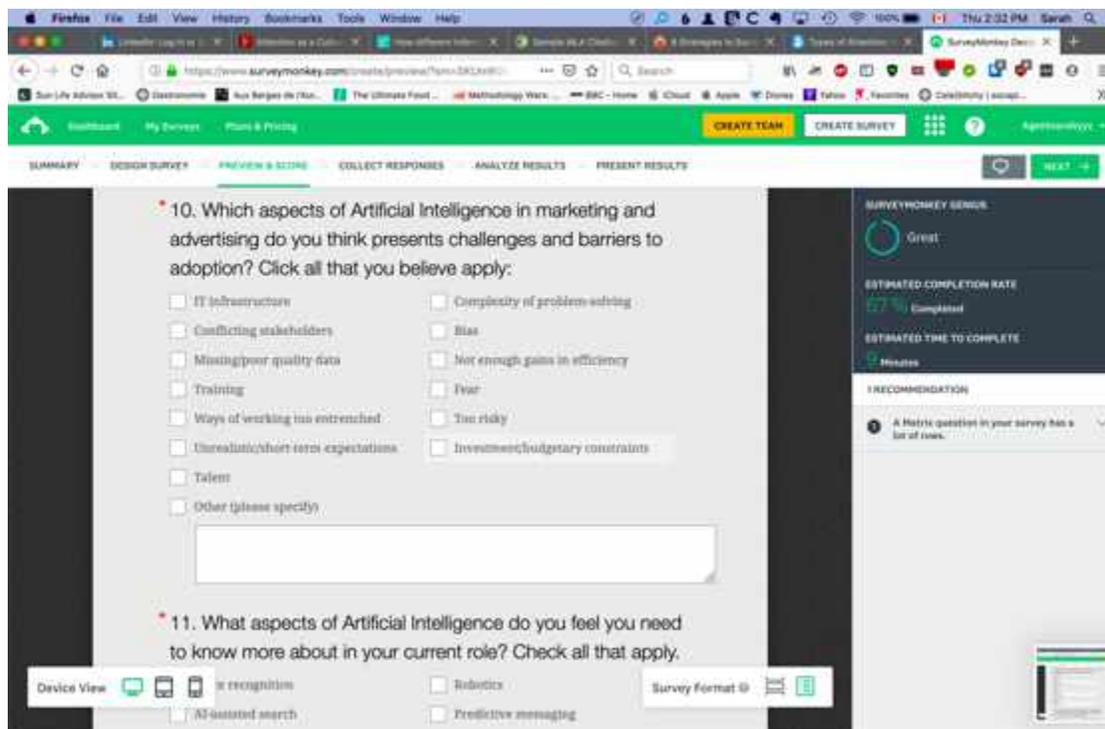
Yudkowsky, E. (2008). *Artificial Intelligence as a Positive and Negative Factor in Global Risk*, Machine Intelligence Research Institute. In *Global Catastrophic Risks*, edited by Nick Bostrom and Milan M. Ćirković (p. 308–345). New York: Oxford University Press.

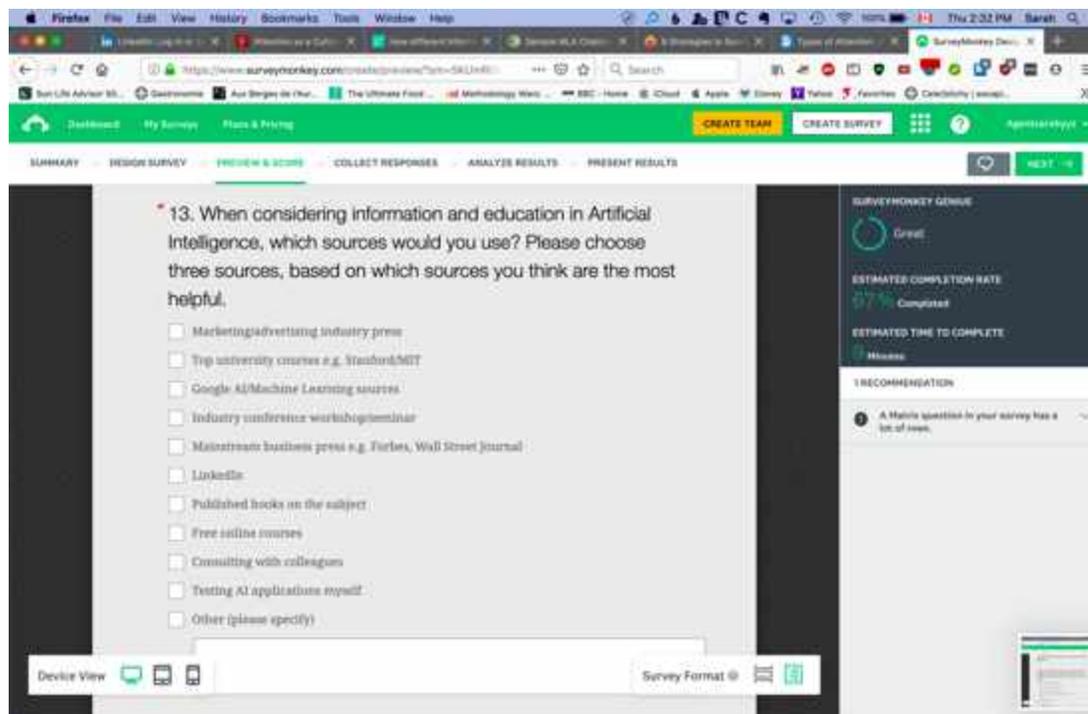
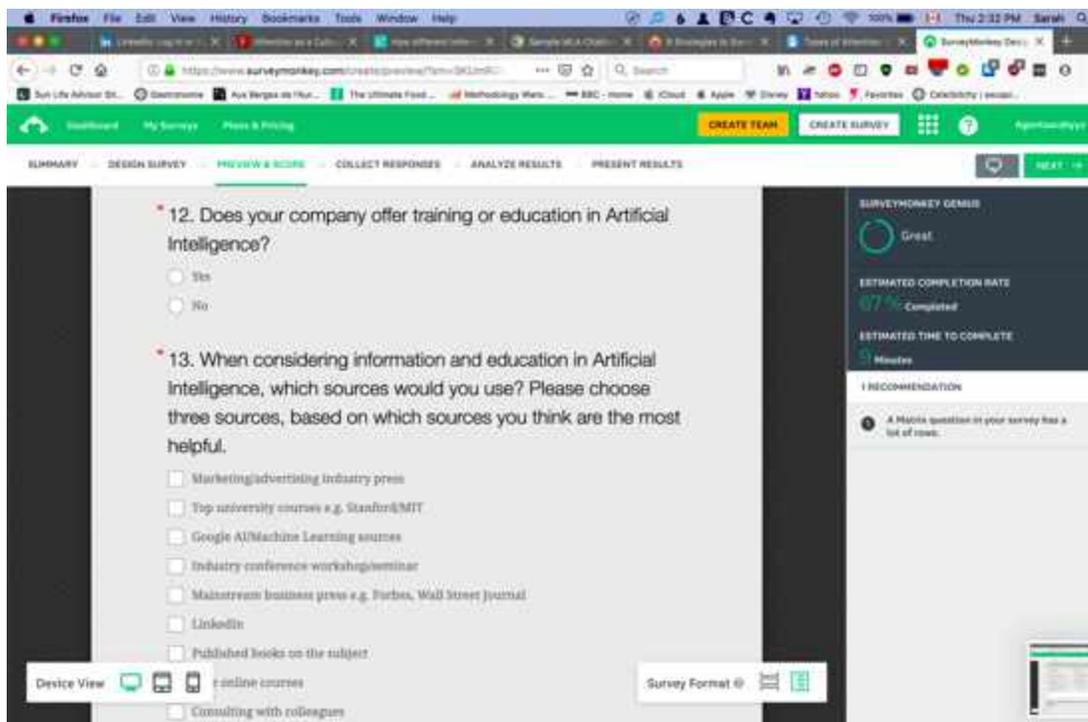
# Survey Questions

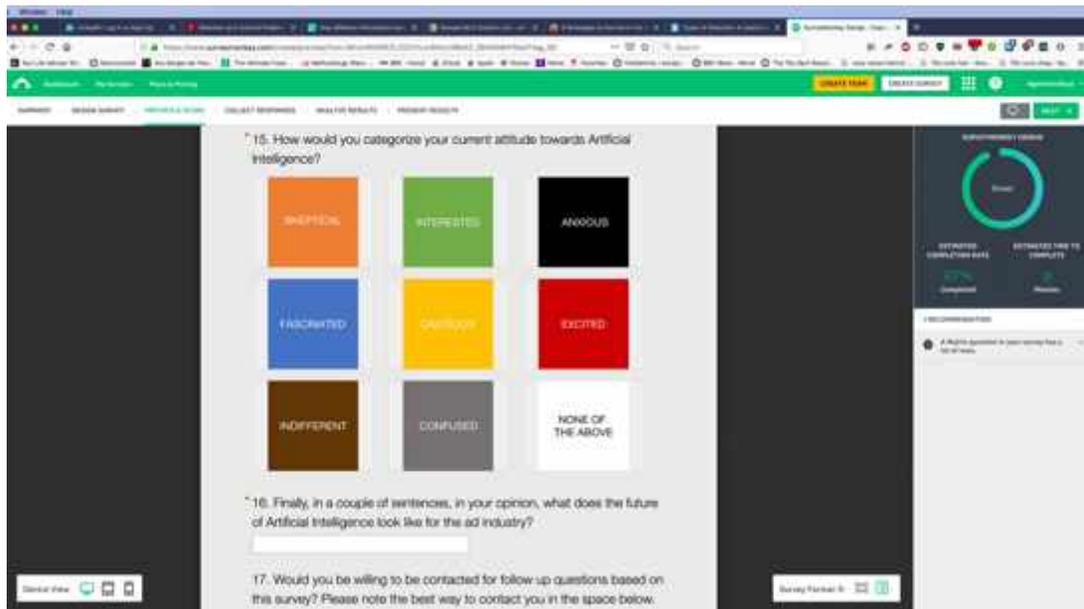
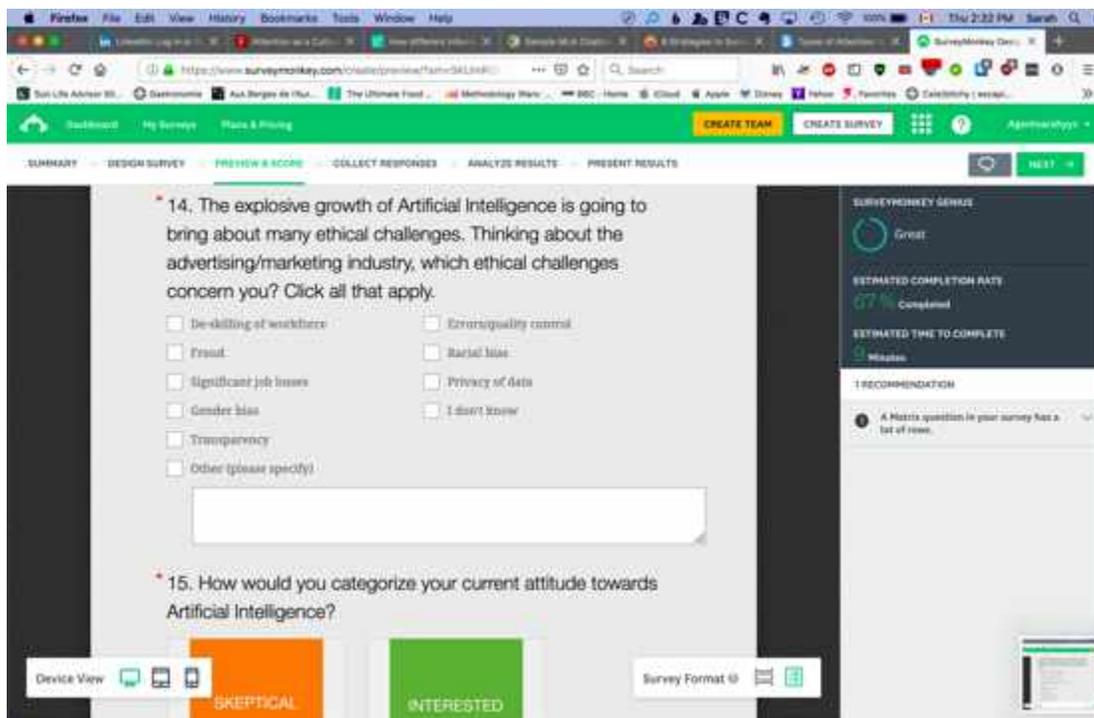


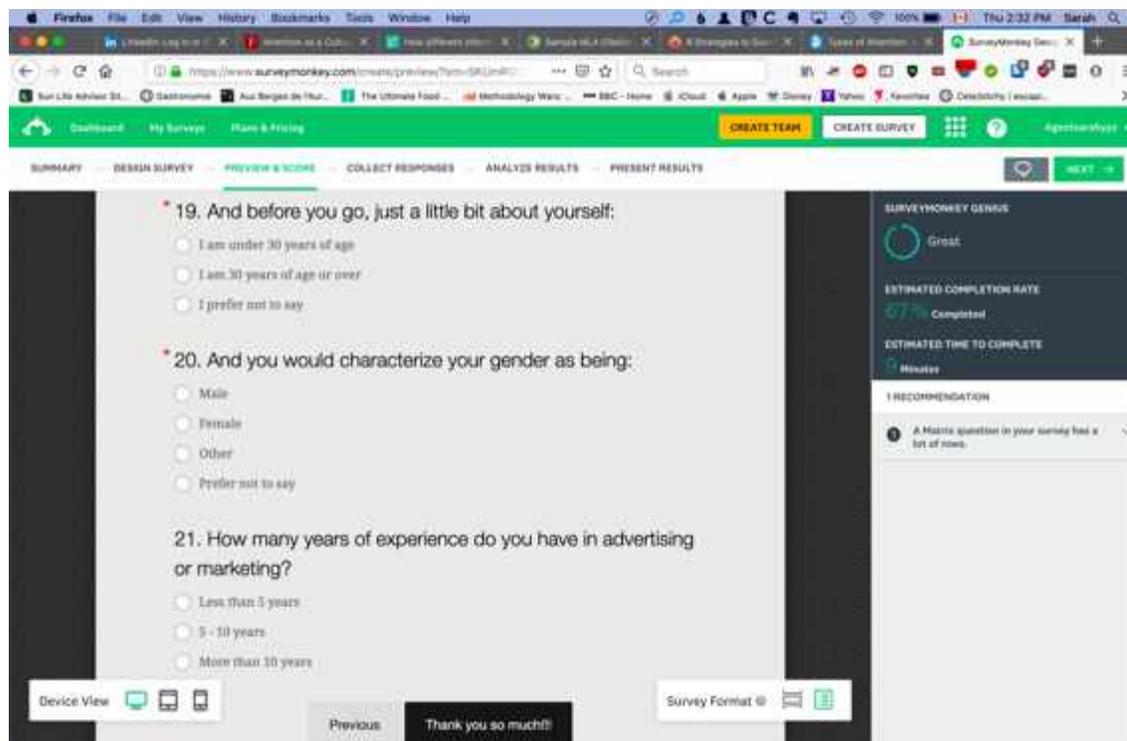
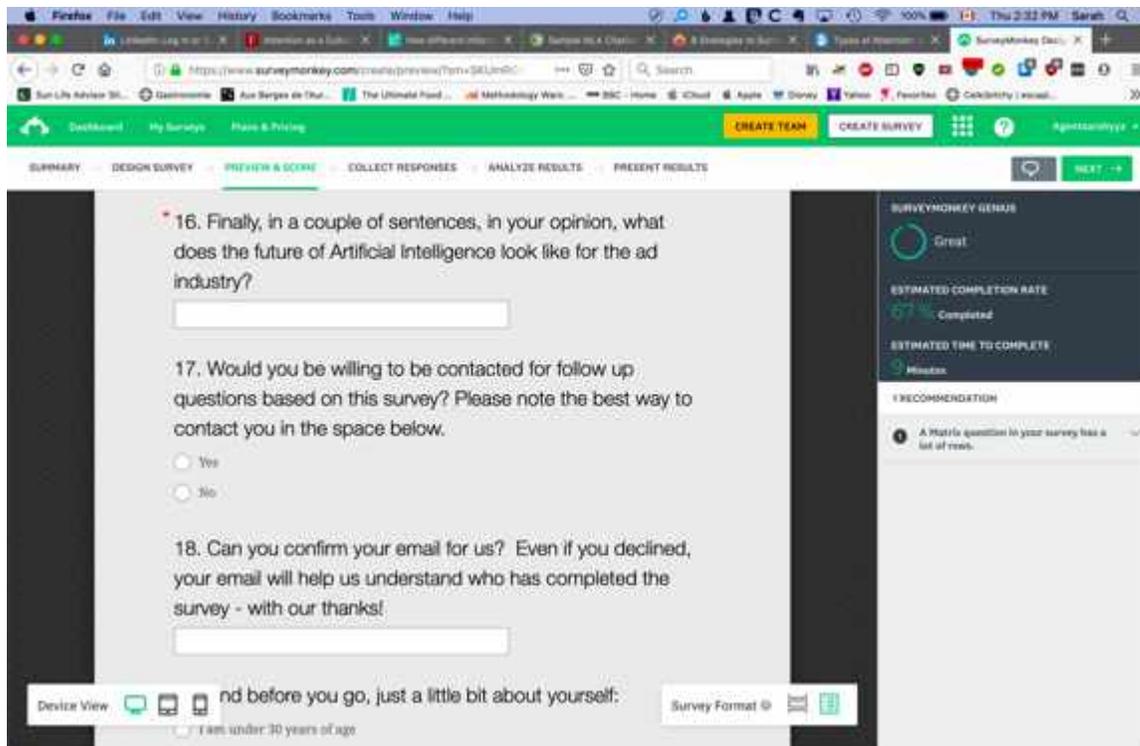












## Research Survey E-Mails

Hi **[[first\_name]]**,

As a busy marketing executive & CEO myself, I certainly respect your time and am hoping you may find just a few minutes to give your opinions about critical changes that are redefining our industry in my survey on artificial intelligence and its impact on advertising and marketing.

The survey is here and will take 10 min or less: <https://www.surveymonkey.com/r/Alandaadvertising>

All participants will receive a complimentary copy of the final results.

I really cannot thank you enough.

Subject **[[first\_name]] [[last\_name]]** - Thoughts on AI & Marketing?

Hi **[[first\_name]]**,

I am reaching out based on your experience in the marketing and advertising industry.

I am hoping to get your opinions in a quick 10 min survey about artificial intelligence, and its impact on advertising and marketing. The findings from the study will be analyzed and published. All participants will receive a complimentary copy of the final results.

<https://www.surveymonkey.com/r/Alandaadvertising>

Thank you, thank you, thank you in advance. I really appreciate your participation.

Talk soon,  
Bant

Hi **[[first\_name]]**,

Circling back to see if you can spare just a few minutes to take my quick survey on artificial intelligence and its impact on advertising and marketing. I'm reaching out to you as I'm hoping that marketing and advertising executives like yourself to provide feedback on how our industry is being disrupted in this quick survey.

The survey is here and will take 10 min or less: <https://www.surveymonkey.com/r/Alandaadvertising>

All participants will receive a complimentary copy of the final results.

Thank you again for your time!

Talk soon,

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Aquesta Tesi Doctoral ha estat defensada el dia \_\_\_\_ d \_\_\_\_\_ de 201\_\_  
al Centre \_\_\_\_\_  
de la Universitat Ramon Llull, davant el Tribunal format pels Doctors i Doctores  
sotassignants, havent obtingut la qualificació:

President/a

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Vocal

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Secretari/ària

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Doctorand/a

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(\*): Només en el cas de tenir un tribunal de 5 membres