

Marketing a transparent Artificial Intelligence (AI): A preliminary study on message design

Anne Wind

University of Twente
5, Drienerlolaan, 7522 NB Enschede
Email: t.j.a.wind@student.utwente.nl
Corresponding Author

Dr. Efthymios Constantinides

University of Twente
5, Drienerlolaan, 7522 NB Enschede
Email: e.constantinides@utwente.nl

Dr. Sjoerd de Vries

University of Twente
5, Drienerlolaan, 7522 NB Enschede
Email: s.a.devries@utwente.nl

ABSTRACT

Artificial intelligence (AI) is emerging as a major disruptive technology for individuals, businesses and processes in various domains. Experts emphasize that AI should be developed and applied transparently and under human control as a basic requirement for wide public acceptance and adoption. While the wider public is not familiar with the details and possibilities of AI, opaque developments and recent events with political and social consequences increase the public anxiety and risk perceptions about this technology. Acceptance of AI by the wider public as a disruptive, yet useful technology requires a proactive attitude and open communication between developers, users and the public.

This article reviews the literature on marketing theories and approaches relevant for designing communication strategies towards the wider public. Using the AIDA approach as red line, the study presents a number of guidelines on designing persuasive communicative messages responsive to the public lack of knowledge and distrust. It provides a starting point for AI evangelists and businesses engaging such technology in better informing and communicating with the wider public and increasing the transparency and acceptance of AI as a promising future technology.

Keywords

Artificial intelligence | AIDA-model | Awareness | Technology Acceptance Model | Trio of Needs | Arousal

1. INTRODUCTION

The advent of an Artificial Intelligent (AI) era has arrived. Although it might not be as prominently visible as in the Sci-Fi movies such as Star Wars or, more frighteningly Ex-Machina, AI is already embedded almost everywhere: smartphones, cars, homes, cities, production lines and logistics facilities and even in everyday household items. However, not many people are aware, let alone involved with the concept (Pega, 2017). Moreover, there seems to be mistrust and restraint towards AI due to perceived risk originating from sensational reporting and 'cultivation' by media (Urban, 2015). This is in contrast with the advice of various experts who stress that AI should be evenly accessible to everyone (Harari, 2018; Open AI etc).

Currently, AI-systems exist in the form of weak AI or Artificial Narrow Intelligence (ANI) (Urban, 2015). It can automatically keep up with groceries shopping, beat any human in a TV quiz or a chess game and make recommendations for the products people should buy on the basis of past buying and surfing behavior. Strong AI, however, is still under development and is still far from within a broader public or business reach (Russel and Norvig, 2010). Strong AI includes Artificial General Intelligence (AGI), AI similar to human-level intelligence, followed up by Artificial Super Intelligence (ASI), an AI preeminently greater than human-level intelligence (Urban, 2015). Mayor enterprises from various disciplines invest in these developments. A July 2017 survey of Vanson Bourne for Teradata held among European, American and Asian enterprises found that 80 percent of businesses is already investing and 30 percent plans to expand their investments in AI. Twenty-five to fifty percent of the companies using AI as a management tool report increased revenue from AI across the board (Teradata, 2017). AI is already replacing a lot of automated processes such as standard emails to employees, basic factory work, research and development and even customer service (Nilsson, 2005; Rotman, 2013).

There is however controversy around Artificial Intelligence. For instance, SpaceX and Tesla CEO Elon Musk stated in 2014: "We need to be super careful with AI. Potentially more dangerous than nukes". The famous cosmologist Stephan Hawking also expressed his concern on AI, stating that the development of strong AI could mean the end of humanity (Shermer, 2017). Conversely, Google Engineering Director and AI-utopist Ray Kurzweil (2005) stated that while AI is developing, it will help us end poverty, hunger, conquer disease and even achieve immortality. According to Kurzweil (2005), we will, together with AI, spread throughout the universe as omnipotent and almost immortal deities.

Whether the consequences of the development of AI are either disastrous or prodigious, one cannot dispute the immense potential of AI. Whether motivations for AI adoption are based on commercial or political criteria, the development of AI should be transparent and above all democratic. Professor Yuval Noah Harari emphasized on the 2018 World Economic Forum how important assets can divide societies (Harari, 2018):

"In ancient times land was the most important asset and if too much land became concentrated in too few hands, humanity split into aristocrats and commoners. Then in the modern age, in the last two centuries, machinery replaced land as the most important asset and if too many of the machines became concentrated in too few hands humanity split in to classes, into capitalists and proletarians. Now data is replacing machinery as the most important asset and if too much of the data

becomes concentrated in too few hands, humanity will split not in to classes, it will split (...) into different species."

To summarize, Harari emphasizes that important assets should not be concentrated in few hands and it should be distributed democratically among humanity (Harari, 2018). This idea serves as the focus of this article: the goal of this article is to present AI developers and users with techniques that will allow them to inform the public properly and get people involved with this technology. Getting more people involved is likely to increase awareness and pressure towards a democratic distribution of AI.

It seems that AI is not always transparently developed or with equal pace among countries. Additionally, it is also not (yet) an approachable concept (Urban, 2015); there are a lot of trust and risk related issues and there also appears to be a knowledge gap (Pega, 2017). We will examine how to raise awareness for AI by looking for methods to reduce risk perceptions and methods to engender interest for the topic and thereby decreasing the knowledge gap. The goal is to provide AI-enthusiast with 'tools' to make AI a more approachable and popular topic and getting laymen involved and in the "know". In this background this article will address the following research question:

How should marketing, communicative messages and campaigns be designed to make Artificial Intelligence approachable to users and consumers?

Strong's AIDA-model (1925) is used to discuss the relevant literature on AI which can help facilitate communicative goals for AI (products). This model clearly describes the customer journey identifying the stages a consumer goes through during the purchase process: the cognitive level at which attention can be drawn, the effective level at which consumers have an interest and desire for a product and finally the behaviorally level at which action takes place (Montazeribarforoushi, Keshavarzsaleh and Ramsøy, 2017). Hence, the model is suitable to describe the processing of communicative messages at the different stages of the purchase and acquaintance process of AI.

In Chapter 2 we present various perspectives on how knowledge of AI should be distributed, or how the usage of AI should be distributed among consumers and companies. Additionally, we discuss the 'awareness; phase of the AIDA-model and explain how to make consumers aware of AI. In Chapter 3 we discuss 'interest' and discuss how to attract consumers' interest for AI. In Chapter 4 we look to the 'desire' and the 'action' phases of the AIDA-model. Finally, a discussion of this literature research is presented and the article is concluded.

2. HOW IS AI CURRENTLY DISTRIBUTED? SOME BACKGROUND AND FACTS

AI, depended on the purpose and domain it serves, is developed both transparently as surreptitiously. Tesla's CEO Elon Musk and entrepreneur Samuel Altman founded the OpenAI in 2015: a company which strives to develop safe Artificial General Intelligence, the first step to strong AI (Urban, 2015). Their purpose is to distribute its benefits evenly and fairly around the world. Open AI is a non-profit organization, which will not keep information private but may create "formal processes for keeping technologies private when there are safety concerns"¹. Despite his pleas for openness, Elon Musk recently left OpenAI, building his own confidential AI for his company Tesla (Kolodny & Novet, 2018).

¹ Open AI: <https://openai.com/about/>

Companies such as Google, the company where AI-utopist Kurzweil is among others head of AI-development, is an Internet search and advertising giant whose business model relies heavily on secretive algorithms. The secrecy is justified by Google using the argument that being transparent about the development processes could amplify the risk of hacking and widen privacy concerns (Hill, 2017). Harari (2018) argues indeed that hacking is going to be a fundamental problem in the future, a problem that will become even more serious if the predictions about implanting AI-chips in human brains are realized: it may be possible to hack peoples' brains (Harari, 2018).

Furthermore, there are also differences in the overall commitment to developing AI among countries. China's increasing prosperity has enabled the country to advance itself as leading world power in various aspects. Point 5 of their "High-End Equipment Innovation and Development" report is focused on Robotics and, among other things argues for the need to "facilitate the commercial application of artificial intelligence technologies in all sectors" (Compilation and Translation Bureau, Central Committee of the Communist party of China, 2016, p. 64). While opinions as to what is the leading country in the development of AI vary (Minevich, 2017; Jacobsen, 2018) a 2017 Teradata report shows that Asian countries are overall in the lead.

2.1 How 'aware' are consumers?

In this section we discuss how awareness should be raised in order to make AI more approachable. Since people are not really acquainted with AI as a concept nor as a product (Pega, 2017), the awareness phase is important and thus most elaborated.

Tim Urban (2015) reviewed in his article the important literature from authorities on AI. He argues that most of the authors and scientists on AI agree that AI is going to have a major impact on life as we know it. Additionally, he found that a large group of scientists is confident that a significant impact of AI is going to happen within the 21st century and that the consequences are going to be extremely good. Ray Kurzweil (2005) argues that the impact will be prodigious, predicting that the singularity (the moment AI reaches a super intelligence-level which causes great impact on life as we know it) will happen around 2045. Similarly, Müller and Bostrom (2013) found in an opinion-survey that something like the singularity would happen around 2060. The same survey also found that, on average, 52% of experts believe that the consequences of AGI are going to be good or extremely good, while 31% believe the outcome is going to be bad or disastrous. The debate among experts is mostly formed around whether the impact of ASI is going to be either positive or negative.

Consumers are focused on more tacit aspects of AI. Although AI is already fully incorporated in many of today products (Gurykaynak et al., 2016), AI is often considered by the public as "a topic for geeks and science fiction enthusiasts". These researchers state that the common view of AI is currently framed by Hollywood as something that is going to enslave humanity or is bent on human extinction. Barrat (2013) emphasizes the confusion and disbelief around AI as partly caused by movies as well. This is in line with well-known theories such as Gerbners' Cultivation Theory (1988) or Bandura's Social Cognitive Theory of Mass Communication (2001) both stating that mass media are greatly influential in shaping our views of what to consider normal. Additionally, Urban (2015) mentions *cognitive bias* as a reason for why people are not involved with AI as a topic. To get really involved, people first have to see tangible facts that will make them believe that an issue is real. For instance, Urban (2015) refers to 1988: the time that computer scientists were constantly talking about how great the impact of the internet

would be. Back then, people could not imagine that computers (or the internet for that matter) could be capable of changing their lives.

To measure the attitude towards AI among consumers, Pega conducted in 2017 a global survey among 6000 adults in North America, Europe, Africa and Asia. 70% Of their respondents said that they understand AI. However, when probed for their actual knowledge, there appeared to be a gap, and many consumers could not even recognize AI's basic tenets. The study stresses that a knowledge gap can easily shape consumers perception on AI. Moreover, the Pega study also identifies the role of the media in causing fear instead of disseminating knowledge around AI: 70% of people feels some degree of fear of AI and 68% would be more open to using AI if it evidently helped them in their daily lives. Additionally, the study found that only 25% of the public would be comfortable with companies interacting with them using AI. This percentage jumped to 55% among respondents who had interacted with AI before, implying that experience and trial increases trust (Pega, 2017). The study also concludes that businesses should take time and effort to comprise thought out strategies to familiarize consumers with the benefits of AI.

2.2 How to raise awareness?

Various studies offer explanations for the adoption and diffusion of new technologies, such as the Rogers' Diffusion of Innovations Theory (2003). We have found no studies that apply these theories to AI, the rationale of the theory can be used to form a general idea on how one could approach the design of a marketing campaign for familiarizing the public with the AI concept and products. According to Rogers, the diffusion of innovations is depending on five factors. First, the relative advantage of the new product should be clear over the old product. Second, the new technology should be compatible with the consumers' current lifestyle. Third, the technology should not be too complex to use. Fourth, the perceived risk of the new technology can reduce the diffusion of the new technology in the market and finally the new technology should be able to be tried out by consumers. Additionally, Rogers' product life cycle curve describes the different stages products go through from introduction till decline. It also describes marketing techniques which should be used at every stage. As such, the introduction phase should be bend on raising awareness through trialability (Kardes, Cronley & Cline, 2014).

Below, studies are presented describing marketing techniques for implementing AI products.

Drawing from the Pega survey (2017), raising awareness for AI (products) should be focused on reducing perceived risk and informing consumers about the construct 'AI' and its potential. For reducing risk, building trust is essential (Rousseau, Sitkin, Burt & Camerer, 1998). Trust is the inclination of an individual to be exposed to the actions of another person (Mayer, Davis & Schoorman, 1995), while perceived risk can be defined as the cumulative of uncertainty and extent of the consequential outcome (Bauer, 1967). Normally, in the context of innovation, perceived risk is about the likelihood a new product will not work properly (Nienaber & Schewe, 2014). However, within AI-literature, perceived risk comes from the allocation of control to a machine and its corresponding control instruments (Castelfranchi & Falcone, 2000). To wit, you have to trust a machine to, for instance, drive your car. Additionally, the Pega survey (2017) found that consumers even fear AI as something that is going to take over the world.

2.2.1 Build trust and familiarity

In order to build trust and reduce perceived risk within campaigns, one can build on three factors identified by Lee and

Moray (1992) in a study examining ways to gain trust in automation: performance, process and purpose (Lee & Moray, 1992). Performance indicates a preference but does not necessarily facilitate adoption. Process refers to understanding the technology (Lee & Moray, 1992). Additionally, when the algorithms (which is a form of process) are transparent, trust is likely to be reinforced (Lee & See, 2004). Purpose refers to trusting intentions. In the context of AI, it refers to trusting the intentions of the company who is programming the AI (Lee & Moray, 1992).

In analogy to the above trust enhancing factors, when designing an awareness campaign for AI (products) one should focus on increasing familiarity: the more familiar consumers become with a product the more claims about the product will be perceived to be true (Scharwz, 2004). Subsequently, messages within the awareness campaign should be repetitive but clear, since these factors engender familiarity (Scharwz, 2004). Second, the messages should be designed to increase trust (and thus decrease risk) as well. Therefore, the performance, process and purpose factors should be taken into account. Below the three factors are described in more detail.

2.2.2 Performance, Process and Purpose

In order to initiate performance trust (the first factor), operational safety and data security are necessary (Hengslter, Enkel and Duelli, 2016). To establish operational safety, it is necessary for a technology to be certified, approved and have policies to govern it. Additionally, these certificates and policies should cover technical as ethical questions. Second, for establishing data security, it is essential to develop security standards and provide consumers with information about how data is used and who has access to the data (Hengslter et al., 2016).

In establishing process information three categories emerged from the study of Hengslter et al. (2016). First, cognitive compatibility appeared to be determinant. Hence, when the algorithms are understandable and relevant for achieving users' goals, the AI system tend to be trusted. The second determinant of process trust is trialability. If users are invited to try the technology, concerns are reduced and understanding of the technology is enhanced. Finally, usability posits that the technology should be easily and intuitively handled (Hengslter et al., 2016).

The third determinant of trust: purpose, describes the motivation for developing the automation. Explaining the purpose appeared to be crucial for evading generalities and to provide consumers with an easily understood message. Additionally, Hengslter et al. (2016) found that design is an important additional factor for the purpose determinant of trust. For instance, the study of Hengslter et al. (2016) found that in the field of the healthcare robots were designed human-like, but in an abstract way. As such, it was clear to users that they were always in control. Finally, Hengslter et al. (2016) found that "stakeholder alignment, transparent development process and a gradual introduction of technology are crucial strategies" (Hengslter et al., 2016, p. 113) for promoting trust in AI.

Finally, it might be wise to use a celebrity in the campaigns as well. Research has shown that celebrities can increase perceived trustworthiness and likeability (Freiden, 1984). Moreover, a study of Agrawal and Kamakura (1995) found that celebrities can reduce perceptions of risk involved in technology. However, the celebrity should 'fit' the product used.

3. INTEREST

The second phase of the AIDA model is bend on creating concern or interest for a new service or product. The objective in this stage is to point out the positive advantages the innovation and

make the potential user interested (Strong, 1925). Cues and messages focused on gaining interest could be drawn from the Technology of Acceptance Model (TAM). The model suggests that consumers behavioral intention to use a new technology is led by perceived usefulness of the new technology and perceived ease of use (Davis, 1998; Davis, Bagozzi & Warshaw, 1989). As such, campaign messages should stress the usefulness and ease of use of the new (AI) product.

Accordingly, campaign messages could be designed on the basis of the theoretical constructs that influences perceived usefulness as they are discovered in a study by Venkatesh and Davis (2000). Their study distinguishes constructs that are influential in either mandatory or voluntarily contexts. Since this article does not focuses on a mandatory context specifically, only constructs influential in voluntarily (or both voluntarily and mandatory, but not only mandatory) context are discussed.

3.1 Perceived usefulness: subjective norm

Venkatesh and Davis (2000) define the subjective norm as a construct influencing perceived usefulness. The theoretical mechanisms by which a subjective norm is influential are the internalization and identification. Accordingly, internalization is a process by which the consumer perceives that if an important referent believes that a new technology should be used, the consumer will also believe the new technology should be used. Identification refers to the process that when important members of a consumers' social environment believe he or she should use the new technology, the consumer will try to lift his position within the group by using the new technology (Venkatesh & Davis, 2000).

Similarly, Katz (1960) among others, describes different persuasive techniques for different attitude functions. As such, to match the subjective norms' mechanisms found by Venkatesh and Davis (2000), persuasive messages for an ego-defensive function appeals to authority and fear (Katz, 1960; Petty & Wegener, 1998; Smith, Bruner & White, 1956), like the internalization mechanism found by Venkatesh & Davis (2000). Similarly, the value-expressive function appeals to the image (Katz, 1960; Petty & Wegener, 1998; Smith, Bruner & White, 1956), like identification in the study of Venkatesh and Davis (2000).

For instance, internalization or messages serving the ego-defensive function could entail a commercial with a well-known scientist advocating AI as trustworthy product. Identification or persuasive messages for a value-expressive function could entail a commercial with a relevant celebrity (advocating AI) to which the consumer can identify.

3.2 Perceived usefulness: job relevancy and output quality

Job relevance is another construct that influence perceived usefulness (Venkatesh & Davis, 2000): A type of message that could stimulate interest in AI is a persuasive message which informs the consumer how relevant AI services or products can be for their jobs, or how compatible it can be for their jobs. Output quality is a construct that also influences perceived usefulness: it refers to how well the new technology will perform on relevant tasks (Venkatesh & Davis, 2000). As such, persuasive messages could use output quality as a theme for a persuasive message to stress the perceived usefulness of AI. However, if a new technology produces effective results, but in an abstract manner, prospective consumers are unlikely to understand how useful the new technology is (Agarwal & Prasad, 1997). Finally, result demonstrability is another construct that influences perceived usefulness (Venkatesh & Davis, 2000). As such, when creating persuasive messages that are bend on

communicating the output quality of AI, make sure these messages are tangible.

3.3 Moderate arousal

Designers of AI services and products should add features that are surprising and interesting. According to the discrepancy-interruption theory, this could increase emotion and arousal (Schacter & Singer, 1962). First, increasing of arousal can lead to an increase of cognitive capacity which can be used to attend to information. However, arousal should not be too high because there exists an inverted 'U-shaped' association between arousal and an individuals' capability to attend to information. As such, consumers should be moderately aroused for optimal attendance to information (Kahneman, 1973). Secondly, small discrepancies produce positive emotions, which in turn can lead to more heavily weighted of positive attributes of a product (Adaval, 2001). For instance, the Tesla Model X is able to do a victory dance. Elon Musk let Model X owners know that their car was able to do this dance via Twitter (Musk, 2016). Here the designers and engineers utilize the advanced technology within the Tesla car to produce a small discrepancy which could led the Tesla owners think (more) positively about the technological capabilities of their car. However, no literature or sources were found that Tesla consciously used the discrepancy-interruption theory as a basis for this marketing event.

4. DESIRE AND ACTION

4.1 Desire

The purpose of this phase of the marketing model is to convert the interest in to desire for the product (Strong, 1925). Since the purpose of this article is to present techniques and rationale for AI-promotive communication in a more general perspective, the relevance of elaboration of these phases is dubious. However, some points are elaborated.

To create desire, persuasive messages should add cues on how AI can be beneficial for consumers' needs. Hence, AI is a very applicable technology which can be incorporated in various products and services. Desires or needs should be identified drawing from the trio of needs, a simplified version of Maslow's Hierarchy of Needs (Kardes, Cronley & Cline, 2014). First people have the need for power, which refers to one's desire to control physiological needs (food, water, air) and their environment (shelter, security etc.). Second, there is the need for affiliation, which refers to the need for belongingness of an important social group. Third, there is the need for achievements, which refers to one's need for accomplishing difficult tasks (Kardes, Cronley & Cline, 2014).

This is true for when companies of AI-products want to promote their products in a more persuasive way. But these cues can also be used as arguments to enthuse, for instance, politicians to invest in AI. For instance, an in-house AI-system could keep up with your groceries and order new groceries when needed. Additionally, it could detect who is a resident and who is a burglar (need for power). While social media's newsfeed algorithms keep consumers up-to-date with their friends and a human-like AI-system keeps your grandmother company (need for affiliation), more utilitarian AI-systems helps you to analyze your company's revenue more efficiently and recommends you on how to invest more proficiently (need for achievement).

4.2 Action

The action phase of the AIDA-model is the final phase and its purpose is to move consumers to buy their product (Strong, 1925). The consumer should have access to the product and know where to buy it.

In a commercial context, companies of AI-products should consider the channel type they are going to use to communicate with their customers. When the AI-product is relatively new and unknown in the market it is best to use a short channel. Here, consumers need to order the product over the internet but can communicate directly with the developers (Kardes, Cronley & Cline, 2014). IBM, for instance, facilitates an online community for their consumers to ask questions and help for services such as Watson Analytics (IBM, n.d.). A long channel is to be considered when the product is relatively known and when companies want to make the product highly available. As such, the product should be able to be bought in various physical stores. However, this type of channel is riskier when it comes to communicating information about the product. As the consumer can encounter unknowledgeable salespeople (Kardes, Cronley & Cline, 2014).

5. CONCLUSIONS AND DISCUSSION

5.1 Conclusions

This article provides a preliminary, literary study on how to design communicative messages regarding the advocacy of (the use of) AI. We found that consumers are reluctant, unaccustomed or misinformed with AI which thwarts the adoption of the technology. Simultaneously, experts and various entrepreneurs denominate AI as one of the most disruptive and important technological developments of our time. Which led various enterprises and countries to invest in AI, while other companies and countries stay behind in the investment of AI. In line with emphasis of professor Yuval Noah Harari, we stress that this might cause a potential gap between societies: one holding a very powerful big data analytics technology and one without.

In order to be able to distribute AI democratically in the first place, the concept must be presented in such a way the public is able to adopt and understand it. Additionally, companies who are selling or advocating AI and who are designing their communicative messages in such a way might have a higher change at delivering their message and selling their products. As such, we have tried to answer the following question:

How should marketing, communicative messages and campaigns be designed to make Artificial Intelligence approachable to users and consumers?

To answer this question, we have used the AIDA model to present messages design at each step of the consumer funnel. As such, at the awareness phase messages should be focused on reducing risk by building trust through familiarity, establishing performance, clearly manifesting process and by being transparent about the purpose. At the interest phase, messages should be formulated clearly on the perceived usefulness of AI in the context of subjective norms and job relevancy. Third, at the desire phase messages or campaigns should be moderately arousing for optimal informational attendance. Additionally, these messages could be formulated to appeal to the three basic desires of consumers. Finally, in the action phase one could take in to account the channel type when creating and distributing (persuasive) messages for AI.

5.2 Discussion

No research was found on whether this is the best rationale for (re)formulating messages which are responsive to consumers' restraint towards AI. This restraint could also originate from other sources, as experts on AI continuously describe how AI is going to change our lives (Barrat, 2013; Gurykaynak et al., 2016;

Harari, 2018; Kurzweil, 2005; Nilsson, 2006; Russel & Norvig, 2010; Shermer, 2017; Urban, 2015). Accordingly, people in general do not like change, this is called the status quo bias (Samuelsson & Zeckhauser, 1998). Therefore, it could be that consumers have a certain inertia to accept AI as a new system in their lives. Polites and Karahanna (2012) found for instance that inertia has a negative impact on perceptions of both ease of use and relative advantage of a new introduced system. Additionally, they found that inertia has a negative impact on intention to use the new system and that inertia moderates the relationship between subjective norm and intentions to use new systems (Polites & Karahanna, 2012). Accordingly, additional research is needed to establish a more complete study for designing communicative and or marketing messages for AI.

Secondly, in this article it was found that the media (movies in particular) has great influence on the perception of AI among (unknowledgeable) consumers. However, no research was found on how the media might help or is helping to close the knowledge gap of AI among consumers. For instance, the widely used movie and series service Netflix offers a variety of pictures that include AI as a topic. Content analysis research should be done on the way these pictures present AI as a topic, why they are presented as such and how that could affect consumers' perception regarding AI. Additionally, experimental research could be done to see what effect these series have on consumers for their acquaintance and knowledge level of AI and their perceptions. Furthermore, scientists such as Bandura (2001) indicated how mass media is influential in shaping consumers' thought processes in what is normal. Findings of the effect the mass media on shaping consumers' perception on AI and how that is, in turn, affecting the acceptance rate of AI as a technology might shed light on the relevancy of, for instance, Bandura's theory. Since the impact of mass media might even be far greater nowadays.

6. REFERENCES

Adaval, R. (2001). Sometimes it just feels right: The differential weighting of affect-consistent and affect-inconsistent product Information. *Journal of Consumer Research*, 28, 1-17

Agarwal, R., & Prasad, J. (1997). The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. *Decision Sci.* 28 557-582.

Agrawal, J., & Kamakura, W. A. (1995). The economic worth of celebrity endorsers: An event study analysis. *Journal of Marketing*, 59, 56-62.

Bandura, A. (2001). Social cognitive theory of mass communication. *Media Psychology*, 3(3),265-299. doi:10.1207/S1532785XMEP0303_03

Barrat, J.R. (2013). Chapter Two the Two-Minute Problem. In J.R. Barrat, *Our Final Invention*. (pp. 23-31). New York: Thomas Dunne Books.

Bauer, R. A. (1967). Consumer behavior as risk taking. In: Cox, D.F. (Ed.), *Risk Taking and Information Handling in Consumer Behavior*. Harvard University Press, Boston, MA, pp. 23–33.

Bostrom, N., & Muller, C.V. (2016). Future Progress in Artificial Intelligence: A Survey of Expert Opinion. In *Fundamental Issues of Artificial Intelligence*. Springer. pp. 553-571

Castelfranchi, C., Falcone, R., 2000. Trust and control: a dialectic link. *Appl. Artif. Intell.* 14 (8), 799–823.

Davis R. P. Bagozzi, P. R. Warshaw. 1989. User acceptance of computer technology: A comparison of two theoretical models. *Mainagem>ent Sci.* 35 982-10

Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Qutart.* 13 319-339. ,

elonmusk. (2014, August 3). *Worth reading Superintelligence by Bostrom. We need to be super careful with AI. Potentially more dangerous than nukes.* [Tweet]. <https://twitter.com/elonmusk/status/495759307346952192>

elonmusk. (2016, December 23). *That is actually rolling out to all Model X's right now.* [Tweet].

Freiden, J.B. (1984). Advertising Spokesperson Effects: An Examination of Endorser Type and gender on Two Audiences. *Journal of Consumer Research*, 10, 135-146.

Gerbner, G. (1998). Cultivation analysis: An overview. *Mass Communication & Society*, 1, 175-194.

Government of China. Compilation and Translation Bureau, Central Committee of the Communist party of China. (2016) *The 13th Five-Year Plan: For Economic and Social Development of The People's Republic of China (2016-2020)*. Beijing, China: Central Compilation & Translation Press.

Gurykaynak, G., Haksever, G., & Yilmaz, I. (2016). Stifling artificial intelligence: Human perils. doi: 10.1016/j.clsr.2016.05.003

Hengstler, M., Enkel, E., & Duelli, S. (2016). Applied artificial intelligence and trust – The case of autonomous vehicles and medical assistance devices. *Technological Forecasting & Social Change*, 105, 105-120. doi: <http://dx.doi.org/10.1016/j.techfore.2015.12.014>

Hill, R. (2017, November). Transparent Algorithms? Here's why that's a bad idea, Google tells MPs. *The Register*. Retrieved from https://www.theregister.co.uk/2017/11/07/google_on_commons_algorithm_inquiry/

Jacobsen, B. (2018, January 8). 5 Countries Leading the Way in AI. *Futures Platform*. Retrieved from <https://www.futuresplatform.com/blog/5-countries-leading-way-ai-artificial-intelligence-machine-learning>

Kahneman, D. (1973). *Attention and Effort*. Englewood Cliffs, NJ: Prentice-Hall.

Kardes, F.R., Cronley, M.L., & Cline, T.W. (2014). Chapter 3 Branding Strategy and Consumer Behavior. In F.R. Kardes, M.L. Cronley & T.W. Cline (Eds.), *Consumer Behavior* (pp. 69-91). Stamford, Connecticut: Cengage Learning.

Katz, D. (1960). The Functional Approach to the Study of Attitudes. *Public Opinion Quarterly*, 24, 163-204.

Keshavarzsaleh, Montazeribarforoushi & Ramsay. (2017). On the hierarchy of choice: An applied neuroscience perspective on the AIDA model. *Cogent Psychology*. doi: <https://doi.org/10.1080/23311908.2017.1363343>

- Kolodny, L. & Novet, J. (2018, February 21). Elon Musk, who has sounded the alarm on AI, leaves the organization he co-founded to make it safer. *CNBC*. Retrieved from <https://www.cnbc.com/2018/02/21/elon-musk-is-leaving-the-board-of-openai.html>
- Kurzweil, R. (2005). *The Singularity is Near*. London: Penguin group
- Lee, J., Moray, N., 1992. Trust, control strategies and allocation of function in human-machine systems. *Ergonomics* 35 (10), 1243–1270.
- Lee, J.D., See, K.A., 2004. Trust in automation: designing for appropriate reliance. *Hum. Factors* 46 (1), 50–80.
- Mayer, R.C., Davis, J.H., Schoorman, F.D., 1995. An integrative model of organizational trust. *Acad. Manag. Rev.* 20 (3), 709–734.
- Minevich, M. (2017, December 5). These Seven Countries Are In A Race To Rule The World With AI. *Forbes*. Retrieved from <https://www.forbes.com/sites/forbestechcouncil/2017/12/05/the-se-seven-countries-are-in-a-race-to-rule-the-world-with-ai/2/#513c116e6039>
- Moser, C.S. (2010, January). Communicating climate change: history, challenges, process and future directions. *Wiley Online Library*, 1(1). 31-53. doi: <https://doi.org/10.1002/wcc.11>
- Nienaber, A.-M., Schewe, G., 2014. Enhancing trust or reducing perceived risk, what matters more when launching a new product? *Int. J. Innov. Manag.* 18 (1), 1–24.
- Nilsson, N.J. (2006). Human-Level Intelligence? Be Serious! *Association for the Advancement of Artificial Intelligence*, 25(4). 68-75. doi: <https://doi.org/10.1609/aimag.v26i4.1850>
- OpenAI. (n.d.). *Artificial general intelligence (AGI) will be the most significant technology ever created by humans*. Retrieved from <https://openai.com/about/#mission>
- Pega. (2018). *What Consumers Really Think About AI: A Global Study*. Retrieved from Pega https://www.pega.com/ai-survey?utm_source=emd&utm_medium=pr&utm_content=AI-Consumer-Study-Part-2
- Petty, R.E., and Wegener, D.T. (1998). Matching versus Mismatching Attitude Functions: Implications for Scrutiny of Persuasive Messages. *Personality and Social Psychology Bulletin*, 24, 227-240.
- Polites, G., and Karahanna, E. (2012). Shackled to the Status Quo: The Inhibiting Effects of Incumbent System Habit, Switching Costs, and Inertia on New System Acceptance. *MIS Quarterly*, 36, pp. 21-42.
- Rogers, E.M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- Rotman, D. (2013, June). How Technology Is Destroying Jobs. *Technology Review*. Retrieved from <https://www.technologyreview.com/s/515926/how-technology-is-destroying-jobs/>
- Rousseau, D.M., Sitkin, S.B., Burt, R.S., Camerer, C., 1998. Not so different after all: a crossdiscipline view of trust. *Acad. Manag. Rev.* 23 (3), 393–404.
- Russell, S.J., Norvig, P., 2010. *Artificial Intelligence: A Modern Approach*. Prentice Hall, third ed. Englewood Cliffs, New Jersey.
- Samuelsson, W., and Zeckhauser, R. (1998) Status Bias in Decision making. *Journal of Risk and Uncertainty*, 1, pp. 7-59.
- Schacter, S., and Singer, J.E. (1962). Cognitive, Social and Physiological Determinants of Emotional State. *Psychological Review*, 69, 379-399.
- Schwarz, N. (2004). Metacognitive Experiences in Consumer Judgement and Decision Making. *Journal of Consumer Psychology*, 14:332-348.
- Shermer, M. (2017, March). Artificial Intelligence Is Not a Threat – Yet. *Scientific American*. Retrieved from <https://www.scientificamerican.com/article/artificial-intelligence-is-not-a-threat-mdash-yet/#>
- Smith, M.B., Bruner, J.S., and White, R.W. (1956). *Opinions and Personality*. New York: Wiley.
- Strong, E.K. (1925). Theories of Selling. *Journal of Applied Psychology*, 9, 75-86.
- Teradata. (2017). *State of Artificial Intelligence For Enterprises*. Retrieved from Teradata https://site.teradata.com/Microsite/AI_Research_Study/LP/ashx
- Urban, T. (2015, January 22). The AI Revolution: The Road to Superintelligence. *Wait But Why*. Retrieved from <https://waitbutwhy.com/2015/01/artificial-intelligence-revolution-1.html>
- Urban, T. (2015, January 27). The AI Revolution: Our Immortality or Extinction. *Wait But Why*. Retrieved from <https://waitbutwhy.com/2015/01/artificial-intelligence-revolution-2.html>
- Venkatesh, V., & Davis, F.D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Institute for Operations Research and the Management Sciences*, 46(2), 186-204. Retrieved from <http://www.jstor.org/stable/2634758>
- World Economic Forum (World Economic Forum). (2018). *Will the Future Be Human?* [Online video]. Available from <https://www.weforum.org/events/world-economic-forum-annual-meeting-2018/sessions/will-the-future-be-human>