How Artificial Intelligence Is Impacting Marketing?

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INTRODUCTION

The aim of this chapter is to present the tertiary literature on AI and to discuss the future of AI's impact in the field of marketing. The literature on AI for marketing is growing steadily. This chapter starts by describing some key concepts of the AI literature. It then illustrates a few important consequences of AI on businesses in general. Finally, it unfolds some of the important ways on how AI is already impacting, and will continue to impact, marketing managers' activities, capabilities, and performance. The chapter ends by discussing the future implication for marketing managers.

BACKGROUND

According to the latest study of International Data Corporation (IDC) (accessed on 01/09/2021, source: https://www.idc.com/getdoc.jsp?containerId=US48125621):

The AI software market grew rapidly during 2020, and with accelerated digital disruption, we expect this market to continue to grow over the forecast period [i.e. 2021–2025]. IDC forecasts the overall AI software market will approach $596 billion in revenue in 2025 at a Compound Annual Growth Rate (CAGR) of 17.7%, with the AI-centric part to approach $123.3 billions at a CAGR of 27.8% over the forecast period," says Ritu Jyoti, group vice president of Artificial Intelligence and Automation Research with IDC's software market research and advisory practice. "Today, AI expertise is focused more on developing commercial applications that optimize efficiencies in existing industries. Acceleration of AI adoption and proliferation of smart, intuitive Machine Learning (ML)/Data Learning (DL) algorithms will spawn the creation of new industries and business segments and overall will trigger new opportunities for business monetization.

AI, and Related Concepts:

AI technologies are being used in manufacturing robots, self-driving cars, smart assistants, proactive healthcare management practices and disease mapping, automated financial investing, virtual travel booking agent, social media monitoring, conversational bot, and natural language processing tools. Let us consider certain examples of some companies from different industries and how they are using AI. iRobot is a company from the consumer electronics industry which has developed Roomba 980, a smart robotic vacuum which can use AI to scan room size, and identify obstacles, and decide the most efficient cleaning routes and how much vacuuming is required. Hanson Robotics, a company based in Hong Kong, has developed Sophia, an incredibly advanced social learning humanoid robot. Sophia can communicate using natural language and human-like facial expressions. Such humanoid robots can have vast con-

sumer and commercial applications, for example in university research and medical training application. Emotech, a company in the Robotics and AI industry based in UK, has created a voice-controlled AI assistant with evolving personality, named Olly. Thanks to evolving machine learning algorithms Olly can study a human's facial expressions, voice inflections, verbal patterns, etc., and can proactively start conversations and is also capable of movement so as to orient itself towards the human user. PathAI, is a Boston-based company in the health diagnostics industry, which created machine learning algorithms to help pathologists analyze tissue samples and to suggest a more accurate diagnostics and propose better treatments. Atomwise is a San Francisco based company in the health industry which uses technology based on Convolutional Neural Networks (CNNs) to create algorithms in order to analyze billions of compounds and fasten the drug discovery processes[1].

It is not a new phenomenon that man has sought to reduce his efforts and to improve his productivity by getting help from machines. However, the distinguishing factor that renders AI unique is that it is making machines intelligent and autonomous. Oberoi (2021) aggregated the works of previous researchers and defined AI as the ability of a system to autonomously learn and interpret from external data and use that knowledge to do specific tasks and achieve goals through rational and flexible adaptation. The Table 1 below provides a few definitions of AI[2].

Table 1. Definitions of AI from academic and non-academic sources

Source	Definition
Non-academic source:	
https://builtin.com/ artificial-intelligence (accessed on 20/06/2020)	"AI is a computer system able to perform tasks that ordinarily require human intelligence... Many of these artificial intelligence systems are powered by machine learning, some of them are powered by deep learning and some of them are powered by very boring things like rules."
Indepth: Artificial Intelligence 2021, Statista Digital Market Outlook, August 2021	Artificial intelligence (AI) essentially refers to computing technologies that are inspired by the ways people use their brains and nervous systems to reason and make decisions, but they typically operate quite differently. There are three main types of AI: machine learning, robotics, artificial neural networks.
Academic source:	
Tegmark (2017), p. 39	AI is the "ability to accomplish any goal, including learning." AI is "non-biological intelligence."
Gibbs et al. (2017), p. 7	AI is "any technique that enables computers to mimic human intelligence using logic, if-then rules, decision trees, and machine learning."
Davenport and Ronanki (2018)	AI depends not on its underlying technology but rather its marketing and business applications, such as automating business processes, gaining insights from data, or engaging customers and employees.
Huang et al. (2019), p. 45	AI is "the ability to learn from various types of data and learn from a massive amount of data (i.e., big data) and update thoughts or actions is what makes us consider a machine to be intelligent."
Haenlein and Kaplan (2019), p. 5	AI as "a system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation."

Huang et al. (2019) explain that there are multiple types of AI systems: mechanically intelligent systems, thinking AI systems, and feeling AI systems. According to Huang et al. (2019) and Huang and Rust (2020, 2021) the mechanically intelligent systems is designed for automating repetitive and routine tasks. For example, remote sensing, machine translation, classification algorithms, clustering algorithms, and

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