



The Contributions of Customer Knowledge and Artificial Intelligence to Customer Satisfaction

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ABSTRACT

Customer knowledge is critical for business and marketing strategy, and companies are turning to Artificial Intelligence (AI)-based data analysis to better understand user experience and behavior in both product and service sectors. This paper discusses the importance of customer knowledge and the tools for obtaining it using AI-based analysis. While AI-based analysis has many benefits, such as advanced and detailed analytics, it also has many drawbacks, such as privacy and the human-biased factor that the machine can learn from interacting with humans. AI is a delicate marketing technology that should be controlled by humans because it cannot replace humans in customer service, relationship management, and critical situations.

Keywords: Customer Knowledge, Artificial Intelligence Technology, Marketing, Customer Satisfaction, Customer Relationship, Communication

JEL Classifications: M31, O32, D83

1. INTRODUCTION

This article demonstrates the value of Artificial Intelligence (AI) based consumer knowledge analysis and how it influences customer satisfaction (CS), as well as how to identify when to utilize AI and when AI can negatively affect CS.

AI is a trending topic in marketing research, particularly in the last 7 years, as evidenced by major shifts in research topics from Customer Relationship Management in 2011 to AI and Data Mining in 2015 to Machine Learning and Big Data after 2017, all of which are derived from AI technology (Figure 1) (Verma et al., 2021).

AI was also trending in marketing strategies during and after COVID-19, according to an Ascebd2 report published by Marketing Charts (2021), which shows that 36% of marketers believe AI and Analytics will have the greatest impact on the marketing strategy (Figure 2).

2. CS AND AI DEFINITIONS

According to Cengiz (2010), CS is the degree to which a customer believes that an individual or company has effectively provided a product or service that fits their demands, and it is socially derived from the customer-product and customer-provider interaction. Customer knowledge is the best indicator of a company's future profit because satisfaction can be defined as an after-sales evaluation of product quality based on pre-sales expectations, and this can affect the company's image and promote the company's name and products in the satisfied customer's circle of acquaintances.

Companies gather information about customers, such as thoughts and comments posted on social media, customer retention, risk management, and brand management, to analyze customer behavior and understand how customers make purchasing decisions. The information is collected to be analyzed using AI technologies that forecast market trends and predict client

Figure 1: Trending topics in research

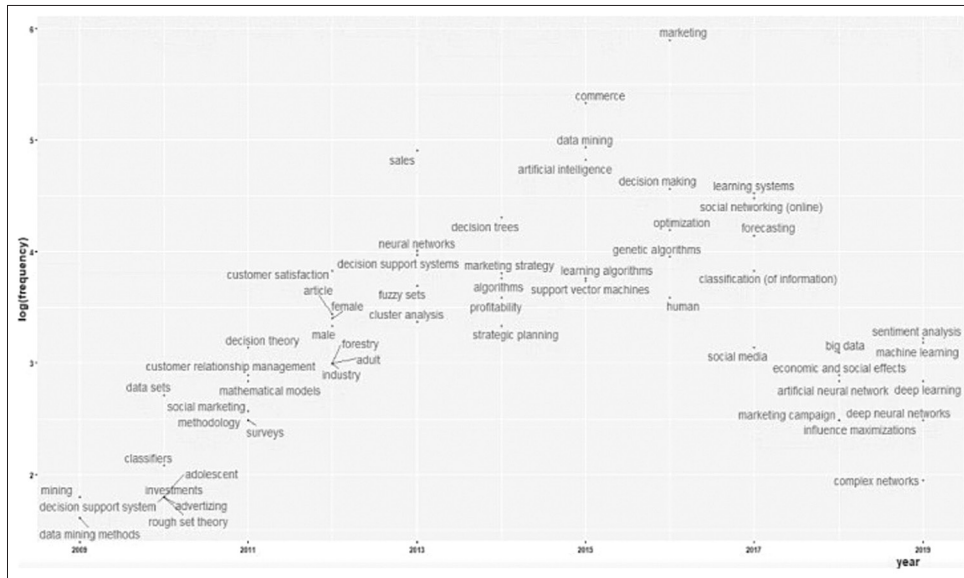


Figure 2: Emerging tech on marketing strategy



behavior. According to Dimitrieska et al. (2018), AI is a subset of computer science that enables computers to perform logical and rational tasks such as vision and knowledge that were previously solely accomplished by humans. This includes tasks such as learning, observing, understanding, communicating, socializing, planning, reasoning, creativity, and problem-solving. As a result, these tasks are subjected to the “Machine Learning” process, which anticipates behavior based on the analysis of enormous amounts of data.

3. MEASURING CS AND THE USAGE OF AI

According to Ilieska (2013), CS can be measured using the CS Index, which is the difference between Service Expectation and the Actual Service Received (GAP1) as per the Gaps Model of Service Delivery (Figure 3).

This model demonstrates the importance of external communications to the customer, which generates GAP4 with

service delivery, which has a direct impact on the perceived service, with Customer Relation Management (CRM) playing a key role in closing the gap between customer expectations and the perceived service, as customer orientation strategies are the most important CRM practices for achieving CS (Angamuthu, 2015).

CRM is now fully automated, due to the latest AI approaches, which employ Machine Learning (ML) algorithms to collect data over time, analyze it, and take action to close the gap between expectations and delivery. The three major categories of machine learning are supervised learning, unsupervised learning, and reinforcement learning.

Unsupervised learning occurs when a machine learns on its own, which is problematic because it may not meet the needs of the consumer. Supervised learning is when a human is involved in labeling the input and output as an acceptable delivery where standards and organized processes can be involved; however, reinforcement learning is a machine learning training method

Figure 3: Gaps model of service delivery

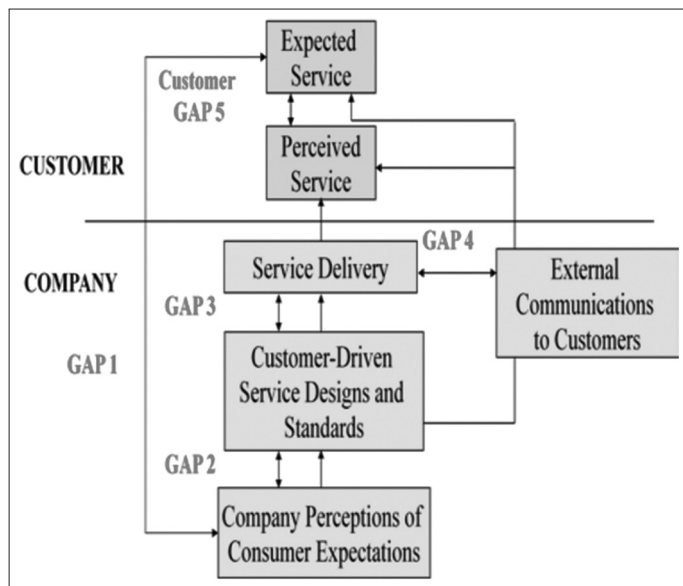
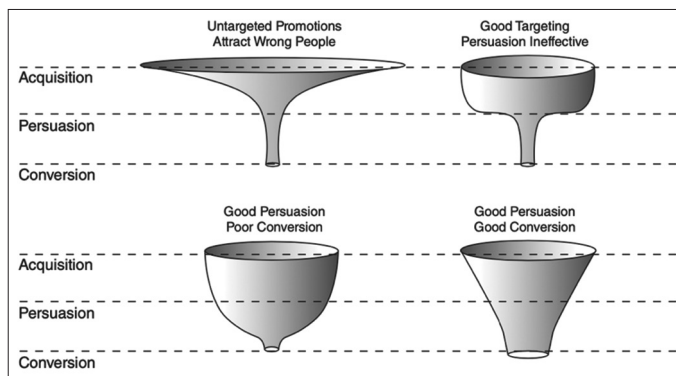


Figure 4: The customer life-cycle



based on rewarding desirable behaviors and punishing undesirable behaviors. Reinforcement learning agents, in general, can perceive, understand, act on, and learn through trial and error. The combination of supervised learning and reinforcement learning is important in minimizing errors and delivering expected and acceptable results.

The supervised learning method in CRM can be used to optimize the customer life-cycle (Figure 4) when the acquisition, persuasive, and conversion techniques are optimized and when the cost of promotions is dispersed effectively. The CRM, for example, is targeting the relevant categories based on the data analyzed as per the AI promotions that can predict customer behavior and forecast purchases (Sterne, 2017).

The chatbot tool, which is extensively used on eCommerce websites and services, is an example of CRM. Setting value and expectations for your clients is critical, as issues might arise even if your chatbot is functioning normally. Chatbots, according to Chen et al. (2021), may not understand the boundaries and hence fail to give the best experience for their users. Online retailers should use a hybrid strategy to deliver a better human-machine interactive environment, relying on both humans and chatbots to serve their clients.

AI is employed practically everywhere these days, such as on smartphones, with a global smartphone penetration rate of over 6.5 billion in 2022 (Statista, 2022). AI is used in process automation, such as automated CRM platforms and the ATMs, cognitive insights involving machine learning, such as ads and promotions that are produced and broadcasted based on insights and customer behavior, and cognitive engagement, such as chatbots where machine learning is involved but in a more interactive way (Davenport and Ronanki, 2018), and this type should be treated properly with human supervision (hybrid approach).

In addition to the hybrid approach in AI, citizens are wary of disclosing personal information, which has been amplified by

recent major scandals involving online privacy and citizens’ personal digital information, which have raised public awareness of these issues and created significant new challenges for any large-scale public data collection. (Fahey and Hino, 2020).

4. DISCUSSION AND CONCLUSION

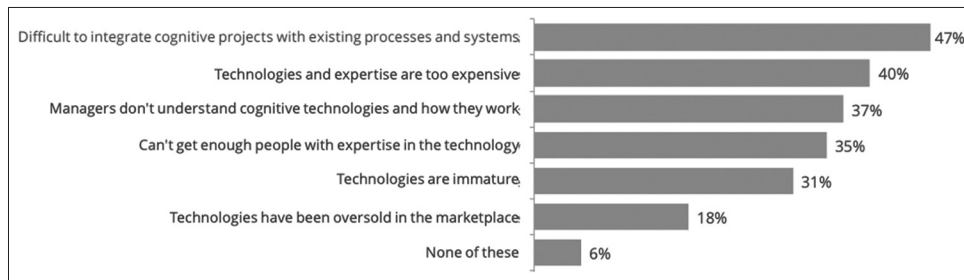
Customer knowledge is a crucial component of achieving CS. Companies are utilizing AI to speed up the data collection process, but this technology should be utilized responsibly and under human oversight. According to Asikaogu (2018), Aristotle said that man is by nature a social animal and is a sophisticated creation. To express needs and fulfill desires, humans engage and communicate.

To avoid human errors, AI should have a global understanding, as algorithms can learn human bias over time, such as the HR recruitment biased selections for candidates based on country of origin and people’s names, or the face recognition error mentioned by Najibi (2020), who was labeled racist because the technology could not recognize the faces of black women as the majority of the developers and testers of this feature were white men. To enrich international and intercultural knowledge, a huge amount of data from a variety of sources is required (Chakravorti, 2022). For these reasons, AI is considered immature by 31% of prominent corporations surveyed on AI implementation in customer service. (Deloitte, 2017) (Figure 5).

To minimize the loss function, machine learning algorithms should learn from a set of samples where both inputs and outputs are known to the analyst (De Bruyn et al., 2020). So, unsupervised learning can be problematic, as demonstrated by Microsoft’s AI Twitter bot “Tay,” which was launched in 2016 to become “smarter” as more millennials interacted with it, but only lasted a day before being bogged down by a barrage of racist and sexist comments from Twitter users, that pushed Tay to echo back to users’ comments aggressively (Tennery and Cherelus, 2016).

Customer service automated chatbots are failing for a variety of reasons, including the bots’ loss of memory, insufficient knowledge and cultural enrichment, and the same robotized conversations that the bot is programmed to execute every time (Valdez, 2018).

As a result, AI is an important technology for satisfying customer knowledge, but it’s also a critical tool that should be used wisely in

Figure 5: Artificial intelligence challenges

such a way not to put machines alone in the front lines of customer service since the Twitter bot, AI customer service chatbots, and the face recognition experiments revealed some complications and critical situations that affected CS. It should also be taken into account the privacy concerns also and the complications of the human cultural diversity and needs, as well as the importance of human-to-human interactions and social behavior with the importance of communication in the Gaps Model to satisfy the client and deliver products, and researchers are encouraged to conduct additional research about the efficiency of the hybrid approach in AI that relies on both humans and machines to assist their customers and how it can affect the CS.

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