The Role of Artificial Intelligence in the Transition to Web 3.0

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Over the last two decades, increasing innovations in technology have led to the worldwide adoption of digital communication. New media, referring to the multitude of forms of digital mass-communication, is unavoidable in daily life. It is hard to give an exact definition of new media, considering the technology it is based upon is constantly changing. Any time an individual opens their computer or phone, whether to read a blog post or play a video game, they are exposed to digital media. Directly alongside the technological changes in new media, the web has been technically developing.

Before 2004, society was in the Web 1.0 era, characterized by consumers using the internet to access basic content and information- think of a Google search for a basic, static website. The transition to Web 2.0 sees consumers creating and sharing their own information online, interacting with each other digitally- "a new kind of experience in using the web" [1]. We are currently in this era, where web-based social media has been adopted globally. As of February 2021, social media is used by 3.96 billion people across the world[2]. Almost 4 billion people using social media creates an abundance of personal data. This can be as basic as one's username in a video game, or as complex as a personal blog containing an individual's full name, contact information, political views, and favorite brands. This data is public, meaning it is easy for companies to access for targeted advertising or third party sales. One can assume that every website collects some sort of data about them, commonly building consumer profiles without their knowledge.

Consumers are beginning to realize they have very little privacy in the Web 2.0 environment. There is a new desire for anonymity, decentralization, and encryption for

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[1] Allen, Matthew. "What Was Web 2.0? Versions as the Dominant Mode of Internet History." *New Media & Society* 15, no. 2 (March 2013): 260–75. https://doi.org/10.1177/1461444812451567.

[2] Dean, Brian. "How Many People Use Social Media in 2021? (65+ Statistics)." Backlinko, February 1, 2021. https://backlinko.com/social-media-users.

individuals to keep their data private. Society is now evolving to Web 3.0, a new environment driven by emerging technology and consumer behavior. First defined by John Markoff of the NY Times in 2006, Web 3.0 is defined by internet-based services using "semantic web, microformats, natural language search, data-mining, machine learning, recommendation agents, and artificial intelligence technologies — which emphasize machine-facilitated understanding of information in order to provide a more productive and intuitive user experience"[3]. As humans have become increasingly reliant on technology for everyday tasks, it is no surprise that the human-computer interaction expands through the web.

The transition to this new, intelligent web, is currently seen in consumers who have the financial and technological means to do so. While the adoption of these new technologies provide advantages for consumers, they pose a threat for companies reliant on consumer data. Unlike the Web 2.0 environment, anonymity and encryption mean that consumer data is no longer easily accessible. An interesting solution to this threat is seen by incorporating artificially intelligent chatbots to websites. These conversational agents(CA), can be used in such a way to nudge "consumers to increase self-disclosure via the promise of more personalized and valuable CA interactions and through evoking social responses through anthropomorphic design"[4]. This potential solution results in an openness to adopt artificial intelligence applications that in turn incentivize consumers to share their data. The changing developments to new media, specifically seen in the Web 3.0 environment, will be largely driven by artificial intelligence.

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[3] Spivack, Nova. "Web 3.0: The Third Generation Web Is Coming." Internet Reports, 2007. https://lifeboat.com/ex/web.3.0.

[4] Thomaz, Felipe, Carolina Salge, Elena Karahanna, and John Hulland. "Learning from the Dark Web: Leveraging Conversational Agents in the Era of Hyper-Privacy to Enhance Marketing." Journal of the Academy of Marketing Science. Springer US, January 1, 1970. https://link.springer.com/article/10.1007/s11747-019-00704-3#citeas, 44.

To better understand the complex technological ideas of Web 3.0, it is important to first understand the three layers of the web. The Surface Web is seen in normal, daily use, consisting of public websites that users can easily find. The Deep Web consists of private sites. These sites are hidden behind a password or other type of authentication barrier, such as logging into an online bank account. The Dark Web is more frequently known for its illegal uses, but is defined as "non-indexed and disconnected websites that require specialized software… specific knowledge and authentication"[5]. Technologically advanced consumers concerned about their data privacy have already transitioned to using the Dark Web for daily use, where they can choose what information is shared and what remains anonymous. When evolving to Web 3.0, we see a transition to a similar structure of the Dark Web, specifically the private information sharing and identity protection methods currently used. Companies that use consumer data to their benefit, such as for targeted advertising, will need to find new ways to build consumer profiles in this private environment. In the Web 2.0 world, privacy is almost nonexistent. The transition to Web 3.0 redefines privacy as "the right and ability to control information about the self"[6] . Being fully autonomous in controlling what information is shared about oneself is one of the goals of Web 3.0.

Digital privacy is not a new idea. It is becoming more of a "fundamental human right, and is recognized as such under Article 12 of the 1948 UN Universal Declaration of Human Rights as well as by the constitutions of many countries" [7]. While governments can introduce new laws to help with the transition to increased privacy, evolution of the web is globally driven by the billions of users. However, increased privacy comes with its own disadvantages,

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[5] Thomaz, Felipe, Carolina Salge, Elena Karahanna, and John Hulland. "Learning from the Dark Web: Leveraging Conversational Agents in the Era of Hyper-Privacy to Enhance Marketing", 45

[6] Felipe, 48

[7] Felipe, 48

especially seen among marketing and advertising companies. In current times, user profiles are used to create targeted ads, product recommendations, and profit from selling this information to third parties. When customers share less data, companies are unable to create these user profiles. Without understanding information about a consumer, marketing becomes more challenging. Disconnected, private websites will not have advertisements, resulting in lost advertising opportunities for companies previously reliant on online advertising. Individual users may also be affected by the evolution of Web 3.0. Individuals may feel a need to invest in more advanced technology to keep up with the constantly changing environment.

The incorporation of artificial intelligence into the web may aid in these potential disadvantages. With public data, AI models can currently learn the way consumers behave on the internet and make consumer predictions that way. Once data becomes private, AI technology will have to 'work' harder. Considering the previously mentioned AI chatbots/conversational agents, AI can learn to adapt to the consumer they are talking to. It is similar to forming a relationship, where the user begins to trust the CA enough to give away their information. Further advancement of AI could even convince consumers that they are talking to a human. One example could be seen on online shopping websites, where a CA can help a customer find the best-suited item, building a consumer profile in the process. In the future, the Web 3.0 environment will benefit the "companies or organisations [who] own the key technologies, infrastructures, data and services across borders and markets- large companies benefit and continue to benefit/shape the future of new media"[8]. Similar to present day, large corporations will continue to thrive and outshine smaller companies once the world transitions to Web 3.0.

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[8] Feher, Katalin. "Trends and Business Models of New-Smart-AI (NSAI) Media." IEEE Xplore. Institute of Electrical and Electronics Engineers, November 26, 2020. https://ieeexplore.ieee.org/document/9322725, 3.

Though artificial intelligence is not a relatively new technology, recent years have brought about new uses and applications. New media will continue to expand when users can create platforms based on an artificial platform-based communication structure. Conversational Agents being a non-linear media stream allows for an easy and constant communication channel. CAs have the ability to collect targeted personal data, so consumer profiles have the potential to become increasingly specific. It will be interesting to see how the future of targeted digital marketing will both benefit and harm consumers and companies. The overall transition to Web 3.0 is likely to benefit technologically advanced companies and wealthy consumers, further causing gaps between social classes