Web's Progression: Moving from Passive Content Consumption to Active Content Creation and Content Validation

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Abstract

This research paper reviews the evolution of the Web from its early phase, web 1.0, to the present state, web 3.0. The primary emphasis is placed on the shift that users have undergone, transitioning from content consumption to content creation, and now towards content validation. During the Web 1.0 era, users could only passively view static web pages. The introduction of Web 2.0 allowed users to generate and share content online. However, in the current era of Web 3.0, personalized content recommendations are offered through machine learning, which makes content validation more important. This study highlights the significance of these changes for digital media professionals, web developers, and web users, and concludes with recommendations for future research.

Keyword: World Wide Web (web), content consumption, content creation, content validation

1. Introduction

Since its inception on January 1, 1983, the internet has gone through significant transformations (Ellis, 1995). Originally designed as a network for government researchers to exchange information, the internet has evolved into an intricate infrastructure that has renovated the way we communicate and conduct business. Over time, the internet has undergone many changes, advancements, and innovations to become the powerful tool we know today.

While the internet has revolutionized the way we access and exchange information, it is the Web that has truly changed the way we interact with digital content (Berners-Lee, 1999). The web, invented in 1989 by Tim Berners-Lee, provided a user-friendly interface for accessing and sharing information over the Internet. The web's ability to link documents together through hyperlinks and enable users to interact with them through web browsers signified a significant advancement that cleared the path for the contemporary internet we are familiar with at present. With the web, users could not only access information but also create and share content, marking a significant shift from the one-way communication model of traditional media.

In line with Ellis (1995), the initial phase of the development of the Web is commonly known as Web 1.0. The primary objective of Web 1.0 was to allow the dissemination of information to the public and establish an online presence. During this period, individual websites consisting mainly of unchanging web pages were prevalent. Web 1.0 was characterized by static pages that were hosted and provided read-only functionality. A notable illustration of Web 1.0 is found in platforms like MySpace and LiveJournal, which were primarily personal and lacked the extensive corporate presence seen on modern websites today.

The second stage of the internet, Web 2.0, has been labeled as a more dynamic and participative web that is people-centric and wise (O'reilly, 2005). In contrast to its forerunner, Web 2.0 empowers users with greater control and has facilitated the expansion of social media as a vital means of online communication. This shift has transformed the internet into a social platform where users can create and share content, not just consume it. Facebook is an excellent example of Web 2.0, emphasizing social connections and engagement, allowing users to publish and share multimedia content, and fostering creativity (Hinton & Hjorth, 2019).

The future of the internet is expected to undergo a significant transformation with the emergence of Web 3.0, a decentralized ecosystem reliant on blockchain technology. According to Rudman and Bruwer (2016), Web 3.0 is the next evolutionary stage of the internet, succeeding static web and interactive web paradigms. The upcoming phase is expected to enable websites and applications to intelligently process information using advanced

technologies like decentralized ledger technology and machine learning, resembling human-like capabilities. Web 3.0, commonly known as the Semantic Web, represents the subsequent phase in the evolution of the internet that promises to be more intelligent, efficient, and personalized than its predecessors. It aims to transform the internet into a more connected, machine-readable, and intelligent platform that can understand and interpret data in a more meaningful way. With the increasing volume of information available online, the challenge now is not just about creating and sharing content, but also validating it to ensure its accuracy and credibility.

In Web 3.0, humans are assumed to play a more important role in content validation, working alongside machine learning algorithms to ensure the authenticity and reliability of the information being presented. This will have significant implications for digital media professionals, web developers, and web users alike, as the focus shifts toward creating more reliable and trustworthy content. Examples of Web 3.0 applications that can handle vast volumes of data include Wolfram Alpha and Apple's Siri. Recently, CopyAI, GPT-3 API, AI writer, Articoolo, Wordsmith, Quill, and other applications have become popular in generating relevant and coherent text based on user input. Unlike previous internet phases, Web 3.0 is decentralized, which gives more power to individual users. The ultimate goal of Web 3.0 is to create a fair internet that enables individuals to be in control and gradually become an integral part of daily life.

The evolution of the Internet has been marked by significant milestones in the form of Web 1.0, Web 2.0, and the forthcoming Web 3.0. These milestones hold great significance, and it is crucial to understand what they represent for the future of the internet. Therefore, in the upcoming sections, we will explore in greater detail the evolution of the web and explore the differences between each stage.

2. Research Methodology

The research methodology employed encompasses a systematic literature review to investigate the evolution of the web, specifically examining the progression of the web from Web 1.0 through Web 2.0 to the upcoming Web 3.0, and the resulting implications. Through a comprehensive search and selection process, relevant academic articles, books, research papers, and other scholarly sources were identified. These sources were critically analyzed to gain insights into the technological, social, and interactive advancements that characterized each stage of the web's evolution. The systematic literature review approach facilitated the identification of common themes and patterns in the transition, highlighting the transformation from static, information-centric websites to dynamic, participatory platforms. By integrating the existing literature, this study aims to offer a comprehensive analysis and understanding of the web's evolution and explore the implications it has had on various aspects of society, such as communication, information dissemination, social interaction, and user experience.

3. Scope and Organization

The scope of this paper is to investigate the transformation of the Internet, tracing its development from Web 1.0 through Web 2.0 and the forthcoming Web 3.0, and to explore the implications of this transformation. The paper begins with an overview of Web 1.0, highlighting its static nature and limited user interaction. It then delves into the emergence of Web 2.0, marked by the emergence of dynamic content, social media, and user-generated content. The discussion further extends to Web 3.0, exploring its concepts such as artificial intelligence, semantic web, and enhanced personalization. Throughout the paper, the implications of each web iteration are examined, including their impact on communication, information sharing, collaboration, business models, and user experiences. The organization of the paper follows a chronological progression, enabling readers to comprehend the historical development of the web and its subsequent stages, while also addressing the implications at each stage. Additionally, relevant examples are incorporated to illustrate the real-world manifestations of these web iterations.

4. Literature Review and Discussion

4.1 Web 1.0 Static Web: Content Consumption

The Internet, as we know it, is a collection of interconnected networks that allow for the interchange of information, ideas, and communication among millions of people across the globe. The term 'Web 1.0' represents the early stage of the Internet, which dates back much earlier than its widespread use. Ted Nelson proposed the concept of hypertext, which is now a key feature of the Web, in the 1960s as part of his Project Xanadu (Beranek, 2007).

The Web was established during the early 1990s when individuals began transforming web servers into publicly accessible points (Berners-Lee et al., 1994). It gained popularity after 1998 when numerous individuals were able to connect their personal computers to the internet and generate personal websites. The Web functions as a fundamental building block for virtual communities to exchange innovative thoughts and provide mutual support.

Humanity is united as a community where we exchange, connect, and help each other to thrive. This system of interlinked hypertext documents is accessed through the Internet. Since its inception, the Web has surfaced as a primary medium for communication, education, and entertainment.

During the early days of the web, building a website meant purchasing a hosting plan and hiring a developer to build it. The sheer size of this undertaking and the complicated process made it difficult for small businesses new to the internet and individuals to get their message out there. Web 1.0 represents the first version of the Web which allowed images, text, and hyperlinks to be displayed on the internet. The first web browser was released in 1990 and was called NCSA Mosaic. It allowed users to display and move around text, graphics, and images within a document.

Web 1.0, sometimes referred to as the "static web," is distinguished by the use of static web pages that were mainly created using HTML and other markup languages. These pages were generally edited manually and were akin to online brochures, lacking in interactivity and functionality. The pages' static nature meant that updates or modifications required a web developer to edit the HTML code directly. During this period, the Internet was mostly utilized for sharing and retrieving information, and e-commerce was still developing. Most websites were straightforward, composed of text and images that the user could only view passively without interacting. It is worth mentioning that despite the term "web 1.0" being typically linked with static web pages, not all websites during that time were static, and some already had limited interactivity like forms and basic scripts.

As the Internet expanded and technological advancements progressed, the concept of electronic commerce (e-commerce) started to gain momentum. The introduction of secure payment systems, such as SSL (Secure Socket Layer), made it possible for businesses to transact online (Chaffey et al., 2019). The late 1990s witnessed a surge of expansion and financial investments in internet-based companies, commonly known as the dot-com boom, many of which were related to the web and focused on e-commerce. The growth of the Internet, along with advancements in technology, created a new economic landscape, as many startups and established companies rushed to establish a presence online (Tapscott & Tapscott, 2016).

The dot-com boom was driven by the idea that the Internet would revolutionize the way businesses operate and that companies with a strong online presence would reap the benefits. However, the dot-com bubble eventually burst in the early 2000s, as many companies that were built on hype and speculation failed to live up to their potential. Many of these companies were unable to generate sufficient revenue to sustain their growth and were forced to shut down. The dot-com crash had far-reaching effects, affecting not only the companies that failed but also investors and the overall economy (Kshetri, 2018).

The emergence of Web 1.0 and the dot-com boom significantly influenced the establishment of the Internet and set up the groundwork for the current digital landscape. Although the dot-com bubble eventually collapsed, it was a crucial phase in the Internet's progress, demonstrating the potential of the web and paving the way for future advancements and expansion.

The web changed the world. It was a breakthrough that pushed information farther, faster, and more broadly than ever before. People use it to improve their lives, enrich their culture, solve problems, help communicate, and teach each other something new. Some of the defining features of Web 1.0 include:

• Static web pages: Web 1.0 was primarily consisting of static web pages, which were created and edited by hand using HTML and other markup languages.

• Limited interactivity: Web 1.0 had very limited interactivity, with most websites being essentially online brochures.

• Limited multimedia support: Web 1.0 had limited support for multimedia, such as images, videos, and audio.

• Limited search capabilities: Web 1.0 had limited search capabilities, with search engines being relatively basic and not very effective.

• Limited e-commerce: Web 1.0 had limited e-commerce capabilities, with most online transactions being straightforward.

• Limited mobile access: Web 1.0 was primarily accessed through desktop computers, with very limited access from mobile devices.

The development of Web 1.0 was marked by several key milestones that helped shape the early internet into what it is today. The key picks of Web 1.0 development include:

• The creation of the Web: In 1989, Tim Berners-Lee, a British computer scientist, proposed the creation of

the World Wide Web, a system for accessing and sharing information through hyperlinked documents. This was the foundation for what would later become the Internet.

• The first website: Tim Berners-Lee developed the inaugural website, info.cern.ch, in 1991. This website was a basic informational page that provided information about the Web and its development.

• The advent of web browsers: The first web browsers, such as Mosaic and Netscape Navigator, were created in the mid-1990s, making it simpler for users to access and navigate the web.

• The growth of e-commerce: In the late 1990s, e-commerce began to gain prominence as a significant contender in the online landscape, with the creation of online shopping sites such as Amazon and eBay.

• The dot-com boom: This period of rapid growth and investment in the internet helped to establish a groundwork for the advancement of Web 2.0.

The impact of Web 1.0 and the rise of e-commerce on our daily lives and business practices has been profound. The early stages of the Web provided the foundation for the growth of e-commerce, which has since become an integral part of the global economy. The development of e-commerce has not only fostered innovation but has also created novel opportunities for both businesses and consumers.

Web 1.0 was a crucial development because it paved the way for the creation of more advanced versions of the web. The limitations of Web 1.0, such as the absence of interactivity and dynamic content, prompted the creation of innovative technologies and programming languages, which ultimately gave rise to the advent of Web 2.0.

4.2 Web 2.0 Dynamic and Social Web: Content Creation

Web 2.0 characterizes a transformation in the way people use and perceive the World Wide Web. It is typified by the emergence of social networking sites, blogs, wikis, and other online collaborative platforms that facilitate more interactive and dynamic web participation. The term "Web 2.0" was first introduced by Tim O'Reilly in 2004, in a paper titled "What Is Web 2.0" (O'reilly, 2005). In this publication, O'Reilly outlined the key features of Web 2.0, which included user-generated content, social networking, and web applications. Cloud computing is an essential aspect of Web 2.0, which is regarded as the second generation of the web. It refers to a developing trend on the internet, where applications and services are hosted on vast server farms, allowing users to access data without having to download it to their computers.

The first iteration of the web was primarily geared towards providing static content, and as a result, Web 2.0 emerged to address its shortcomings. This movement strives to make technology more user-friendly, interactive, and inclusive for people. Instead of solely consuming information, Web 2.0 emphasizes collaboration and networking, intending to assist both individuals and businesses in creating, editing, and sharing content through various online applications. The introduction of new web technologies like AJAX, RSS, and XML has enabled developers to create dynamic and interactive websites. Web 2.0 is characterized by openness and flexibility, encouraging individuals to contribute their content and participate in various social media activities such as blogging, photo-sharing, and video-sharing.

The expansion of broadband internet was another element that contributed to the inception of Web 2.0, as it enabled users to access multimedia content like video and audio. This gave rise to the emergence of various video-sharing websites like YouTube and audio streaming platforms like SoundCloud. Web 2.0 emerged as a result of the convergence of various elements, including the adoption of new web technologies, evolving user behavior, and the demand for more dynamic and interactive online experiences. Websites today are more captivating and interactive than they were before. They utilize a mix of graphics, images, video, and text to engage users, allowing them to share information with others and connect via social media networks.

Web 2.0 is an approach to designing and building websites that emphasizes collaboration and user participation, two key features of new communication technologies. Web 2.0 includes the concept of the social web, where people share information and knowledge through collaborative communities, such as blogs and wikis. Web 2.0 describes a wide range of technologies that provide users with more interactivity, let you create and share content, allow businesses to get closer to their customers, and allow you to use the world's knowledge like never before. It is a set of software that allows you to create and edit documents online, collaborate on projects in real time, manage your email more efficiently, and communicate more easily than ever before.

Web 2.0 encompasses a range of crucial features, including:

• User-generated content: Web 2.0 simplified the process of content creation and sharing for users, enabling them to produce and disseminate their content, such as blogs, videos, and podcasts.

• Social media: In the era of Web 2.0, social media platforms like Facebook, Twitter, and LinkedIn gained

prominence, enabling users to connect and exchange information among themselves.

• Collaboration: Web 2.0 made it easier for people to collaborate and work together online, through tools like wikis and Google Docs.

• Rich Internet Applications (RIAs): Web 2.0 introduced the use of rich Internet applications (RIAs) like Adobe Flash and AJAX, which made it possible to create more interactive and dynamic web experiences.

• Cloud computing: Web 2.0 made it possible to store and access data and applications on remote servers, rather than on a user's computer, through the use of cloud computing.

• Mobile device access: Web 2.0 made it possible to access the web on mobile devices, with the development of smartphones and mobile browsers.

• Data and personalization: Web 2.0 enabled the collection, storage, and analysis of data, allowing for personalization of the user experience.

It's worth noting that these features, along with others that were not mentioned, were developed gradually and the term "Web 2.0" is not a technical standard, but a way to describe the changes that happened on the web during a certain period.

The change from Web 1.0 to Web 2.0 was demonstrated by several key changes in the way the Internet was used and perceived. Some of the signs of this transition include:

• Increased User Participation: Web 2.0 marked a shift from a passive consumer of content to an active creator of content. This was made possible through the widespread embracing of social media platforms and the increasing prevalence of user-generated content.

• Greater Interactivity: Web 2.0 brought about a greater level of interactivity between users, with features such as comment sections, forums, and the ability to easily share and spread information.

• Personalization and Customization: Web 2.0 allowed for greater customization and personalization of the internet experience, with the advent of personalized news feeds, online shopping recommendations, and other personalized content.

• Data and Information Sharing: Web 2.0 facilitated the sharing and exchange of data and information through platforms such as blogs, wikis, and podcasts, leading to a more collaborative and interconnected online community.

• Focus on Community: The rise of social media and other community-based platforms marked a shift away from individual websites and toward a more communal and interconnected online experience.

E-commerce continued to grow and evolve, with the advancement of "Web 2.0" and the ascent of online networking platforms and mobile technology. Online shopping has become more convenient and accessible, with more individuals shifting to the Internet to make online purchases and access services. The growth of e-commerce has also changed the way businesses operate, with many companies adopting a multi-channel approach to reach customers online and in physical stores. Today, e-commerce has become a central part of the global economy, with businesses of all sizes leveraging the Internet to reach customers and sell products. The growth of e-commerce has created new opportunities for entrepreneurs and has had a significant impact on the economy, creating jobs and driving innovation.

As technology advances swiftly, the internet stands at the threshold of a forthcoming era marked by the arrival of Web 3.0. This transformative phase holds the potential to revolutionize our online interactions and experiences.

4.3 Web 3.0 Decentralized and Semantic Web: Content Validation

The emergence of Web 3.0 signifies the advent of the subsequent phase in the progression of the Web, which employs blockchain technology, decentralized protocols, and smart contracts. It is also sometimes known as the "Semantic Web" since its primary goal is to improve the current Web's capacity to comprehend and interpret human language and context.

Web 3.0 is the next stage of the internet's evolution, offering a more decentralized, democratized web experience. Unlike Web 2.0, which focuses on social networking and user-generated content, Web 3.0 is characterized using blockchain technology and decentralized applications (dApps). This allows for greater control over personal data and reduces reliance on centralized intermediaries. Web 3.0 also includes smart contracts, which embed the terms of the agreement directly into lines of code, enabling secure and automated transactions without intermediaries. These features provide a more transparent, secure, and decentralized online experience, promising to revolutionize the way we interact on the internet.

As Web 3.0 emerges, its advanced features and greater interactivity will make it a more sophisticated and advanced version of the current web. With enhanced privacy protections, users will have greater control over their data. The permanence and importance of this technology are assured, making it worth exploring its capabilities. This new stage of development promises to transform the internet into a more efficient, decentralized, and transparent online experience.

To ensure the quality of the content produced in this new era of the web, content validation is necessary. Content validation involves assessing web pages and documents to ensure compliance with specific rules established by stakeholders, such as users and management. This process helps to improve content quality, manage a page's content, and safeguard visitors against harmful sites and attacks by enabling them to differentiate between authentic and fake news. As Web 3.0 continues to develop and gain importance, validating content will become increasingly crucial to ensure a safe and trustworthy online environment.

By validating content, users can improve its quality before it's made available to the public. This process can be part of a review before publishing or serve to highlight issues with specific items. Content validation aims to manage a page's content and ensure it doesn't contain unwanted elements. The ultimate objective is to safeguard visitors against harmful sites and attacks by enabling them to differentiate between authentic and fake news.

Web 3.0 provides the capability to validate content before publication, which is particularly beneficial for those creating online content and social media posts who wish to ensure that their work is of high quality. This extension represents a major overhaul of the 2.0 version and offers a nearly complete version of our next-generation content validation techniques. Dynamic validation is used by this extension to pinpoint potential issues in content and provide precise recommendations based on content requirements. All web content is evaluated by computer algorithms that are intended to prevent the inclusion of inappropriate or harmful language.

Although there is ongoing discussion regarding the precise definition of Web 3.0, it commonly denotes the upcoming iteration of the Internet that surpasses the capabilities of Web 2.0. The invention of Web 3.0 is significant for several reasons and can profoundly influence the current and future landscape of the Internet.

•   Decentralization: Web 3.0 is expected to be built on decentralized systems that avoid intermediaries and facilitate direct interactions between users. This has the potential to unlock novel business models while enhancing security and privacy measures for users.

•   Blockchain Technology: Web 3.0 is expected to incorporate blockchain technology, which could provide a more secure and transparent way of conducting transactions and exchanging data. This has the potential to greatly influence sectors such as finance, healthcare, and supply chain management.

•   Artificial Intelligence: Web 3.0 is expected to increase the utilization of artificial intelligence and machine learning to personalize user experiences, automate processes, and improve decision-making. This has the potential to create substantial implications across various industries, including e-commerce, advertising, and healthcare.

•   Semantic Web: It is anticipated that Web 3.0 will integrate the concept of the semantic web, a system that empowers machines to grasp the semantic context of information available on the Internet. This could enable new forms of search and discovery, as well as new applications that require the ability to understand and process complex data.

•   Interoperability: Web 3.0 is expected to enable greater interoperability between different systems and platforms, which could make it easier for users to access and use data across different applications and services.

The invention of Web 3.0 is significant because it represents the next phase of the Internet's evolution and holds the possibility of revolutionizing the way we communicate with one another, conduct transactions, and access and use data. While the exact nature and impact of Web 3.0 is still uncertain, it is clear that it has the potential to bring significant changes to the internet and the way we use it. The Web 3.0 mantra is all about creating content, but what happens when your employees create low-quality content? How can you find out what's popular or trending on social media – and which are the most influential sources?

Despite the aid of Web 3.0 technologies, human contribution remains crucial in generating content that is both of high quality and engaging. Even though Web 3.0 technologies can assist with tasks such as organizing information, analyzing user behavior, and facilitating transactions, they cannot replace humans in producing the ideas and creativity behind compelling content. Furthermore, human supervision is essential in guaranteeing the accuracy and authenticity of content, particularly considering the growing prevalence of synthetic media and deepfakes. Certain types of content, such as opinion pieces and creative works, may not be completely generated

or verified by technology, thus necessitating human judgment and expertise. Therefore, while Web 3.0 technologies can support content creation and curation, the role of human validation and critical thinking is critical in ensuring that the content is precise and meets the intended audience's requirements. Human creativity and critical thinking will always be essential in generating quality and engaging content, regardless of technological advancements that make content creation and distribution more efficient.

5. Conclusion

This literature review provides insight into how the evolution of the web has impacted content consumption, creation, and validation, through the transition from the Web 1.0 phase to Web 2.0 and eventually Web 3.0. The changes in these three elements have significantly affected how users interact with the web, and there is much to explore about the future of the web. As advancing technologies like artificial intelligence, virtual reality, and the Internet of Things (IoT) persist in their development to transform content creation, consumption, and validation, it is important to examine their impact on the web's users and explore new ways to optimize content creation, consumption, and validation. However, even with the assistance of Web 3.0 technologies, human input remains crucial in producing quality and captivating content. While Web 3.0 technologies can help with tasks such as information organization, user behavior analysis, and transactions, humans are still needed to generate the ideas and creativity behind compelling content. Furthermore, human oversight is essential in ensuring the accuracy and authenticity of content, especially considering the increasing prevalence of synthetic media and deepfakes. Future studies should also consider the ethical and societal implications of these changes to ensure that the web continues to serve as a valuable tool for knowledge dissemination, communication, and social progress.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal and publisher adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

Open access

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