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Theory of Information and Communication

Sara Martinez Cardama

Lisandra Otero Borges

5.1 Social Internet



Social Networks

Social networks have revolutionized how we interact and share information, becoming a fundamental pillar in the evolution of the Internet. Today, they are as essential in our daily lives as household appliances or cars in our routines. Social networks have established themselves as the primary means of communication with family, friends, and colleagues. In this text, we will explore the role of social networks within information and communication, analyzing their evolution and the key concepts that have emerged from their use, such as collaboration and social participation.

Social networks have been closely linked to the popularization of the Internet and the proliferation of platforms for sharing information. However, the term "social network" has much deeper roots that precede the development of digital technologies. Social networks originated long before, with significant contributions from mathematicians and sociologists. According to Recuero (2005), the first advances in understanding what we now know as social networks date back to the mathematician Euler in 1736 and his graph theory, laying the groundwork for analyzing the connections between individuals. Euler modeled the city as a graph, where the points (nodes) represented land areas, and the lines (edges) represented the bridges connecting them. His approach allowed for the analysis of the structure and connections of a network, which laid the foundation for the mathematical study of relationships and interactions between elements.

In social networks, graph theory is applied to represent individuals as nodes and their relationships as edges. This allows for the study of the structure of social networks, identification of connection patterns, analysis of the centrality of certain individuals, and understanding how information or influence flows within these networks.

Modern sociology has enriched this approach, especially through Structural Analysis or Social Networks Analysis (SNA), which offers a perspective for examining social relationships and the structures that emerge from them. Regina Maria Marteleto (2010) defines social networks as an interdisciplinary concept used in Anthropology, Sociology, Economics, Political Science, and Information Science. Social networks enable a more dynamic understanding of society, focusing on the relational links between individuals rather than traditional roles and functions. This highlights how social networks enhance the capacities of acting, sharing, learning, resource acquisition, and mobilization of the individuals who participate in them.

Currently, the phenomenon of social networks is often associated with digitality, and indeed, in that context, they have developed rapidly with great social acceptance, leading to the emergence of modern forms of knowledge creation and dissemination and enabling human interaction despite geographical distance. However, it should not be forgotten that social networks originated outside the digital environment; their integration into the electronic arena was merely a consequence of individuals adapting to technological development.

For Cobo and Pardo (2007), social networks are defined as "all those tools designed for the creation of spaces that promote or facilitate the formation of communities and instances of social exchange" (p.13). Meanwhile, Hanneman (2000) states that "the basic idea of a social network (...) is a set of actors (or points, nodes, or agents) among which there are links (or relationships). Networks can have many or few actors and one or more types of relationships between pairs of actors" (p.3).

Therefore, it can be said that social networks are more than a platform, tool, or website; social networks are a philosophy of life and communication that promotes social exchange, a set of practices, experiences, values, interests, identities, cultures, and relationships demonstrated by large human groups where trust, mutual knowledge, and commitment are evident, which enables the creation of bonds and a sense of belonging among their participants.

Evolution and Characteristics of Social Networks: From Web 1.0 to Web 3.0

The evolution of the Internet, from its beginnings with Web 1.0 to the emerging Web 3.0, has radically transformed the way we interact online, particularly through the rise and development of social networks. During the era of Web 1.0, the Internet was characterized as a static and one-way space, where users consumed information passively through websites with fixed and limited content. In this phase, interaction was minimal, and most users were limited to reading and observing without actively participating in creating or exchanging content.

Web 1.0 began in the early 1990s, launching the first websites around 1991-1993. This period marks the beginning of the World Wide Web as a mass communication medium based on technologies such as:

- HTML (HyperText Markup Language): The markup language used to create and structure web pages, allowing the inclusion of text, images, and links.
- HTTP (HyperText Transfer Protocol) is a communication protocol that enables data transfer over the web, facilitating communication between browsers and web servers.
- Basic web browsers: Such as the first graphical browser, Mosaic (launched in 1993), which allowed users to access and view content on the web.
- Static websites: Web pages were mostly static, meaning the content was not dynamically updated. Users simply consumed the information presented without interacting with it.
- URLs (Uniform Resource Locator): Used to locate and access web pages.

This limited environment gave way, starting in 2004, to Web 2.0, marking a radical change in the online experience. The Web ceased to be a mere repository of information to become an interactive platform that facilitated user-generated content and fostered global collaboration, laying the foundation for the rise of social networks.

Web 2.0 emerged around 2004, significantly transforming how people interact online. This new approach allowed users to consume content and create, share, and collaborate in its development. Tools and platforms like Wikipedia, YouTube, Flickr, WordPress, Blogger, MySpace, and Facebook became fundamental pillars of this era, enabling the formation of online communities and the exchange of information on an unprecedented scale.

The main characteristics of Web 2.0, according to Cobo and Pardo (2007), include:

- The Web as a platform: Applications operate online, allowing access and information sharing from any Internet-connected device.
- Collective intelligence: Web 2.0 is based on user collaboration, where they actively contribute to constructing knowledge through edits, comments, and content creation.
- Simplicity and usability: Tools are designed to be intuitive and easy to use, facilitating participation from a broad spectrum of users.
- Enriching experiences: Technologies like Flash, Ajax, and Ruby on Rails made a more interactive and dynamic online experience possible.
- Social networks as a pillar: Social networks became a central part of Web 2.0, where users could connect, interact, and form online communities.

Tim O'Reilly, credited with the concept of Web 2.0, highlighted in his work the seven constitutive principles of Web 2.0 applications:

1. The World Wide Web as a platform: Applications accessible from any network-connected device.
2. Harnessing collective intelligence: Encouraging user participation and collaboration in content creation.
3. Database management as a core competency: The importance of data collection and analysis for platform functionality.
4. End of the software release cycle: Continuous evolution of applications without the need for downloads or installations by the user.
5. Lightweight programming models: Focus on simplicity and flexibility in application development.
6. Software is not limited to a single device: Access to applications can be done from multiple devices.
7. Enriching user experiences: Creating dynamic and engaging interfaces.

Despite significant advances, Web 2.0 has not been without criticism. One of the main challenges has been the proliferation of misinformation, raising concerns about the quality and veracity of user-generated content. Additionally, the freedom of expression on these platforms has allowed the spread of hate speech, and facilitates illegal activities, presenting profound ethical and legal challenges. The sustainability of business models based on Web 2.0 has also been questioned, highlighting the need to find a balance between openness and economic viability to avoid exploiting users and ensure the protection of fundamental rights in the digital environment.

The evolution of the Web continues toward what is known as Web 3.0, or the "Semantic Web," which promises a more intelligent and meaningful integration of information. In this phase, it is expected that machines will be able to understand and process content at a deeper level, allowing for an even more personalized and efficient user experience. This semantic web is presented as an environment where information is organized more intelligently, enabling machines to understand the meaning of data and not just process it.

Characteristics of Web 3.0:

1. **Decentralization:** Unlike previous versions of the web, where data is typically stored on centralized servers, Web 3.0 utilizes technologies such as blockchain to decentralize the ownership and control of data. This increases transparency, security, and user control over personal information.
2. **Semantic Web:** Web 3.0 employs semantic processing to understand better the context and meaning of content on the web. Machines can interpret and connect data more accurately, facilitating more personalized and relevant user experiences.
3. **Artificial Intelligence (AI):** Web 3.0 integrates advanced AI capabilities to analyze and process large volumes of data, improving automation and decision-making. This could lead to more intelligent virtual assistants and extreme personalization of the user experience.
4. **Connectivity and Ubiquity:** Web 3.0 is characterized by the ability to seamlessly connect multiple devices and systems, creating an environment where information is accessible anywhere and at any time. This promotes a more advanced Internet of Things (IoT), where devices can interact more effectively.

Web 3.0 is still in a phase of development and adoption, so it is not yet a fully established reality, but it is advancing rapidly. Some of its key technologies, such as blockchain and smart contracts, are already being used in various industries, and decentralized projects are gaining traction. However, the full realization of Web 3.0, with its vision of a completely decentralized and semantic web, still faces technical, regulatory, and adoption challenges (DRCF, 2023).

Advances in AI, blockchain, and the growing focus on privacy and decentralization indicate we are moving toward Web 3.0. However, transitioning from Web 2.0 to Web 3.0 will likely take several years, as it involves a fundamental shift in infrastructure and how we interact with the Internet.

Digital Culture

Digital culture is a phenomenon that has radically transformed the way people interact, collaborate, and participate in the creation of knowledge and the construction of collective identities in digital environments. Memes, for example, are a distinctive element of participatory digital cultures, playing a key role in forming collective identities through shared humor and common political goals. These elements reflect users' ability to connect and unite around shared meanings and experiences, strengthening bonds within online communities.

In this context, digital culture refers to access to information and users' ability to interact and collaborate online. This is evident in how digital platforms, such as blogs, wikis, and collaborative tools, have facilitated the collective creation of content and transformed relationships between individuals, including scientists and their audiences. These tools enable continuous and collaborative exchange, promoting a collective intelligence fundamental to digital culture.

Web 2.0 has been defined as an "architecture of participation," where collaboration and user-generated content are fundamental pillars. Social networks have emerged and thrived in this environment, transforming online interaction

and offering new possibilities for creating virtual communities. However, along with these advances, challenges have also arisen, such as variability in the quality of information and the risk of misinformation.