Information Science and contemporary challenges

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Created in the 1950s to serve as a model for the organization of documentation and technical-scientific bibliography (Sambaquy, 1957), the Brazilian Institute of Information in Science and Technology (Ibict) assumed the coordination of actions related to information in Science, Technology, and Innovation (ST&I) in subsequent decades[1]. Over time, it reorganized its activities in accordance with the informational challenges of each era. Understanding its historical role at the forefront of research and the development of solutions for scientific and technological information, Ibict now turns its attention to the informational characteristics of contemporary society, its new challenges and new opportunities, and proposes an action strategy consistent with the emerging challenges.

In the 20th century, the world experienced a series of advances that enabled the understanding of information as an essential raw material for promoting the development of society (Committee on Engineering Information of the World Federation of Engineering Organizations, 1981). This hopeful perspective on the use of information was corroborated by the works of Bell (1973), Castells (1999), and Lévy (1999), who pointed to a cultural shift in production and its respective use, foreseeing advances that would consolidate a connected society, supported by information and capable of building a “collective intelligence” (Lévy, 1999). However, these transformations also highlighted structural inequalities and deepened the exclusion of certain social segments, in addition to promoting other forms of exercising power by individuals, organizations, or technologies.

From the 2000s onwards, it became possible to observe a new shift in our culture, which became centralized around platforms and focused on the digital environment. The current form of production, circulation, and consumption of data and information has created dynamics that altered the informational flow under the sophism of unrestricted access. In reality, these dynamics run counter to the idea of networks and collectivity envisioned in previous decades, reviving archaic perspectives on the centrality of informational control and the use of information infrastructures as centers of power.

[1] Created on February 27, 1954, by Presidential Decree No. 35,124, then named the Brazilian Institute of Bibliography and Documentation (IBBD), Ibict undergoes a transformation based on CNPq Executive Resolution No. 20/76.

INFORMATIONAL CHALLENGES

This shift in the informational axis brings challenges that amalgamate with major national issues.

Disinformation has always been a human problem, but with the appropriation of the informational flow by digital platforms, this issue has gained a new scale. The definition of the term infodemic by the World Health Organization (2020) to signal the excess of inaccurate information and its impact on decision-making marked the understanding that this would become a global issue. Since then, the problem has affected areas such as health, the environment, education, and even the economy. For this very reason, the latest World Economic Forum defined disinformation as one of the greatest risks to the global economy (WEF, 2026).

Associated with disinformation is another challenge marked by the uncritical use of technologies. The advancement of artificial intelligence and other communication technologies has allowed a considerable number of Brazilians to migrate to digital environments without any concern for the digital inclusion of these individuals in the informational environments made available to them. This process did not consider the characteristics necessary to ensure information literacy and the development of a collective intelligence, as proposed by Lévy (1999). On the contrary, the large-scale absorption of these technologies has often promoted individualization and the reinforcement of prejudices and biases (Moura; Braga, 2023). In this scenario, there is no technology transfer; what is enabled is merely its use, creating a relationship of dependency and keeping the country as a mere consumer of technology (Vieira Pinto, 2005).

Another factor that represents a major challenge is the attempt to invalidate science as an instrument for decision-making. This was intensely perceived during the COVID-19 pandemic, when scientific consensus was ignored by a large part of the population and public administrators. Regarding the environment as well, there is a chronic process of emptying the agenda and adopting a denialist and opportunistic stance, aiming at short-term economic gain to the detriment of the planet's sustainability.

The change in data and information consumption habits also reflects a major current challenge. On the one hand, we have users who prioritize access to social media—platforms that maintain a closed ecosystem and disregard the interoperability principles of the World Wide Web, as proposed in its conception. Furthermore, this access to social media grants its users a false sense of anonymity, a characteristic that promotes aggressive and hostile behavior (Recuero, 2013). On the other hand, we have an increasingly individualistic society, where primary interaction is based on digital environments. The result of this is a decrease in interaction among people, including within families, with distancing caused by the excessive use of mobile devices (Silva; Silva, 2017).

The adoption of Generative Artificial Intelligence for information search and retrieval represents a new step in this abrupt change in digital content consumption. Information is no longer merely intermediated by algorithms; it is now also rewritten by them, distancing its original producer from the consumer even further, thus attributing biases that are scarcely perceived by society.

These informational problems are not independent; on the contrary, they are intrinsically connected and feed off each other, amplifying negative impacts and demanding an integrated strategy in order to address them.

THE ROLE OF INFORMATION SCIENCE

Information Science (IS) was built from different perspectives in a process that occurred simultaneously in several countries. Some works, such as those by Pinheiro (2005) and Araújo (2014), pointed out the phases and characteristics that culminated in the systematization of this science. From a historical perspective, it is necessary to highlight the work of Otlet, who created the concept of the document and defined the study of documentation, and Mikhailov, who delved into the understanding of the role of scientific information. Since its beginnings, Information Science has been concerned with the recording of information, developing techniques to identify and map human knowledge, expanding access, and enabling the construction of new knowledge. Countries such as the United States, Russia (former Soviet Union), and England advanced greatly in this process, which was later incorporated by other nations, and allowed the expansion of the field, which began to include studies on scientific and technological information, knowledge management, information policy and economics, information representation, user studies, metric studies, information technologies, among others. These characteristics allow for dialogue with different areas of knowledge. It is the transversality of information and the current relevance of studies in the field that reinforce the capacity that Information Science has to deal with the challenges presented.

Considering these characteristics of Information Science and the need to face contemporary informational problems, Ibict presents to the academic community the concepts that will guide its actions in the coming years: *informational integrity and justice*; *information for citizenship*; *open science*, and *informational sovereignty*.

INFORMATIONAL INTEGRITY AND JUSTICE

Information Integrity is the pillar of our society. It is what ensures that information serves as an input for social, environmental, and economic development. It does not refer to a dichotomy between truth and lies, but rather to the mapping of informational flows in order to ensure that the transmitted message is consistent with the information produced, so as to identify the author of the original message and guarantee that it remains intact throughout its entire cycle up to its emitter, or receptor.

It is not enough to ensure that the information is reliable; it is necessary to enable its production, access, and use under equitable conditions, considering all the diversity of our country. Informational justice encompasses the evaluation of political, income, ethnic, gender, and accessibility aspects, aiming at the inclusion of different actors in the informational landscape and promoting public debate on the egalitarian appropriation of the entire information cycle, having its ethical use as a fundamental cornerstone.

INFORMATION FOR CITIZENSHIP

Information is an essential resource for the full exercise of citizenship. It is not only about the availability of information on public policies and social programs, but about the effective development of competencies related to information seeking, critical use, and production. Informational strategies must incorporate the country's multicultural character, its demands for accessibility, multilingualism, and the support for people in greater social vulnerability, allowing information to act as an agent of social transformation. Digital inclusion permeates the entire history of Ibict and is one of the most relevant elements in its institutional structure. It becomes even more important in the face of today's informational challenges, when it is necessary to incorporate elements of media literacy, personal data management, critical competence, the exercise of citizenship, and a deepening of the public debate on the need to democratize access infrastructures.

OPEN SCIENCE

Ibict has been advocating for Open Science for decades. Its commitment to the subject is foundational, and the actions undertaken have brought about advances in the national and international arenas. We understand that Open Science offers pathways for national scientific activity to gain even greater relevance, being evaluated according to parameters that allow for the recognition of national advancements. Furthermore, it is an instrument that can contribute to greater cooperation among countries, acting as an element of science diplomacy. Beyond Open Science tools, it is necessary to incorporate its principles into scientific practice and into the interaction with society. By using it as a guiding concept, Ibict reinforces its understanding that this should be the priority policy for Brazilian science.

INFORMATIONAL SOVEREIGNTY

The creation of Petrobras, the Brazilian nuclear program, ethanol, and so many other initiatives are examples of a systemic quest for the construction of a sovereign nation. The very history of Ibict's creation reflects Brazil's quest for a specific type of sovereignty: informational sovereignty. In an avant-garde manner, the country created the Institute that would serve as a model center for the management of scientific and technological information for several other countries. In the early 2000s, the country proposed a public policy of digital sovereignty by promoting free software as the standard in public administration—an action that, previously questioned, is now being implemented by countries in Europe. Despite its success, the policy lost momentum over the last decade, being finally discontinued in 2016. Informational sovereignty, as proposed by Ibict, goes beyond digital sovereignty by considering elements of the appropriation of informational flows, service infrastructures, algorithms, and interoperability standards, and, finally, the incorporation of free software and hardware.

TRANSFORMING SOCIETY THROUGH INFORMATION SCIENCE

Ibict is about to launch its strategic plan for the coming years. The Institute's scientific agenda considers information as an essential input for the advancement of the social, environmental, and economic aspects of our country. For this to happen, the Information Science scientific community must understand its role in building the conditions that will allow Brazil to deal with the informational challenges of our times.

We invite the entire scientific community to join this agenda. It is through the lens of Information Science that Ibict advances, with the certainty that, together, we will build a better society.

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