Types of Information

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Abstract

To meet the demands of the 21st-century digital economy and the fourth industrial revolution, dominated as they are by technologies and generation Z users, there is a need to understand the different types of information that people use in everyday life for decision-making. Information users need to develop independent critical thinking and effective use of information and information technology. There is a variety of information sources, and users must have the relevant skills for searching and to ensure discoverability to the full. Therefore, information and digital literacy skills are of paramount importance for the socioeconomic development of a country.

Glossary

Artificial intelligence (AI) The simulation of human intelligence processes by machines, especially computer systems. AI technologies include machine learning, natural language processing, and computer vision, among others.
Big data Large volumes of structured and unstructured data that cannot be processed or analyzed using traditional data processing techniques.
Digital information Refers to data and content that is stored and represented in a digital format and can be processed, transmitted, and stored electronically.
Digital literacy The ability to find, evaluate, and use digital information effectively and responsibly. It includes skills such as searching the internet, critically evaluating online sources, and understanding issues related to privacy and security online.
Disinformation Deliberately false or misleading information spread to deceive or manipulate others, often for political or ideological purposes.
E-governance The use of digital technology and information systems by governments to provide public services, communicate with citizens, and improve transparency and efficiency in governance.
Grey literature Information produced and published outside of traditional commercial or academic publishing channels. It includes reports, theses, government documents, and other types of material that may not undergo formal peer review.
Peer review The process by which scholarly work is evaluated by experts in the same field before it is published in a journal or presented at a conference. Peer review helps ensure the quality and credibility of academic research.

Key Points

- Etymologically, the term **information** is a noun formed from the verb "to inform.
- Information is written in a form that is useful to people to whom it is addressed, to support decision-making, human knowledge, and communication in the technical, economic, and social domains.
- **DIKW** hierarchy describes the relationship between data, information, knowledge, and wisdom.
- The **choice of information** content is based on the specific information needs of the individual. Knowing what type of information, you need will help you decide which sources to use.
- **Types of information** are identified as conceptual, empirical/factual, procedural, stimulatory, policy, directive, reciprocal, and subjective.

 doi:10.1016/B978-0-323-95689-5.00206-6

- The **digitalization of information** has ushered in a new era, with web-based and mobile work processes and services underpinned by intelligent data analysis increasingly shaping high-tech work environments and productivity.
- **Sources of information** are categorized into different groups such as: primary, secondary, and tertiary.
- **Popular information sources** are written for a public audience, not for subject experts, often by journalists.
- **Scholarly information sources** are sources that are used for academic purposes and written by academics and other experts to contribute to knowledge in a particular field.
- **Digital information**, comprising data, content, and knowledge stored in digital formats like text, images, audio, and video.

Introduction

The concept of information is understood differently, hence the definition. Etymologically, the term information is a noun formed from the verb "to inform". Information is beyond its day-to-day usage (Burgin, 2010). Information is defined by Jamil *et al.* (2013), as an organized set of data, referred to the same context, homogeneous, and by Slamecka (2024) as facts and opinions provided and received during daily life. Furthermore, information is obtained directly from other living beings, from mass media, from electronic data banks, and from all sorts of observable phenomena in the surrounding environment. Accessing and using such facts and opinions enables the receiver to generate more information. Information is communicated to others during discourse, by instructions, in letters and documents, and through other media (Slamecka, 2024). Information is written in a form that is useful to people to whom it is addressed, to support decision-making, human knowledge, and communication in the technical, economic and social domains. Furthermore, data and information must be provided from a variety of sources to produce knowledge (Jamil *et al.*, 2013).

Below is the Data, Information, Knowledge, Wisdom **(DIKW)** hierarchy that was developed by Zeleny (1987) and Ackoff (1989) to describe the relationship between the four concepts (**Fig. 1**).

Frické (2019) interpretation of Zeleny (1987)'s and Ackoff (1989) hierarchy is that data is the symbolic representation of these observable properties in that data acquisition is provided by automatic instrument systems; an unstaffed weather station, for instance, may record daily maximum and minimum temperatures; such recordings are data. Information in hierarchy is relevant, usable, significant, meaningful, or processed data. Illustrated in the form of questions beginning with, for example: "who," what," "where," "when," or "how many", then data is processed into an answer to an inquiry for it to become "information". Data itself, however, is of no value until it is transformed into a relevant form of information. Knowledge in this hierarchy is explained as know-how, or skill, rather than knowledge in the sense of the know-that of propositional knowledge. Wisdom, as the last in the hierarchy, is essential to the effective pursuit of ideals, and the pursuit of ideals itself, is one of the characteristics that differentiates man from machines. The three lower layers of the DIKW hierarchy can be recorded and manipulated by computers.

Based on the DIKW hierarchy, information is not data and knowledge is not information. Information and knowledge are used interchangeably in most cases, as adopted in this entry. Technology has altered the way people interact with information in the

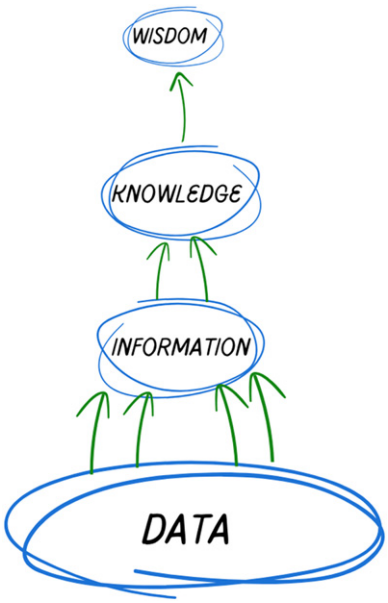

Fig. 1 DIKW hierarchy, adapted from Frické (2019).

physical and cyber environments of everyday life (Weller, 2007). Any communication of information can be understood at the following levels as narrated in Bawden and Robinson (2022):

- Empirical, which is referred to as the physical transmission.
- Syntactic, which is referred to as the language or coding used.
- Semantic, which is referred to as the meaning of the message.
- Pragmatic, which is referred to as the significance of the message to a recipient in a particular context.

The purpose of this entry is to present the analysis of the concept of information, different types of information, information sources, accessibility of information, artificial intelligence,

Types of Information

People access different types of information for different purposes. The choice of information content is based on the specific information needs of the individual. Knowing what type of information is needed will help an individual to decide which sources to use. The following types of information have been identified by Hertz and Rubenstein (2014):

- Conceptual information: information that is based on ideas, concepts, theories, or hypotheses rather than facts. Conceptual information is used in academic or philosophical contexts to discuss broader ideas or concepts unrelated to specific examples or instances. It includes disciplines, theories, and philosophical concepts that are used to build a framework or foundation for understanding more specific or concrete information about specific concepts, theories, and principles by offering a way to explain and interpret the studied phenomenon (Luft *et al.*, 2022).
- Directive information: this is a type of information that describes a particular object, person, event, or situation in detail. The description may include appearance, size, shape, color, texture, or behavior. The idea or purpose is to create a mental image or picture of something or to provide a complete understanding of a particular topic or concept, (Ashikuzzaman and Ashikuzzaman, 2023), a good example is a description of the medicine leaflet in the medicinal box.
- Empirical information: information gathered directly or indirectly through measurable observation or experimentation that may be used to confirm or disprove a scientific theory or to help justify, or establish as reasonable, a person's belief in a given proposition. A belief may be said to be justified and verified if there is sufficient evidence to make holding the belief reasonable and scientifically proven (Wang *et al.*, 2021; Costa, 2024) alluded to the fact that empirical information matched scientific facts.
- Policy information: information about government policies, laws, regulations, and guidelines that affect individuals, organizations, and society. Policy information focuses on decision-making and the design, formation, and selection of policies. It includes information about policy objectives, processes, outcomes, policy implementation, and evaluation data (Ashikuzzaman and Ashikuzzaman, 2023).
- Procedural information: is the type of information that helps people to know what actions they must execute to get something done. Action-oriented information is a central part of instructions and that other information types are subordinate to this information (Karreman *et al.*, 2005).
- Reciprocal information: refers to the communication process during which the information sharers expect the receivers to reciprocate, while receivers feel obligated to return the favor. Reciprocal information is an important incentive for social sharing, and received reciprocation is considered a central part of the mechanism through which sharing benefits the sharer (Liu *et al.*, 2022).
- Stimulatory information: information that creates a response or stimulation in a person or group of people. Stimulation information is mostly used in advertising, marketing, or public relations campaigns, including political campaigns, of which the goal is to capture the audience's attention and encourage them to act. It is a type of information that is designed to induce a particular emotion, such as excitement, fear, or curiosity, or it may be intended to challenge or inspire the audience to think differently (Ashikuzzaman and Ashikuzzaman, 2023).
- Subjective information: this refers to information that is based on someone's view and opinions. Information that is not validated by authority or expert in the subject matter (Ashikuzzaman and Ashikuzzaman, 2023).

Sources of Information

Sources of information are categorized into different groups such as: primary, secondary, and tertiary. Those categories distinguish the context in which information was created and for whom it was created.

Primary sources are first-hand observations or experiences and original sources of information before they have been analyzed and manipulated. Examples include Eyewitness reports obtained from interviews, photographs, speeches, diaries, memoirs, Empirical research, original documents, historical newspaper articles, literary works (novels, plays, poems), artworks, and Tweets among others. *Secondary sources* are those created because of a review or an analysis of primary sources. Secondary sources include Biographies, nonfiction books, Editorials, Literary criticism and reviews, Periodicals such as scholarly journals, magazines, or newspapers, and Retweets. *Tertiary sources* contain information generated from both secondary and primary sources; examples are reference materials. which include Encyclopedias, dictionaries, indexes, databases, catalogs, and most textbooks (Butler *et al.*, 2021)

Numerous sources, including books, daily newspapers, government documents, peer-reviewed journal articles, reviews, radio, podcasts, commentary, and more, can be used to obtain information. A multitude of information sources, including social media platforms and blog posts, have emerged because of the digital technology crisis, despite print media sources. Digitalization and the creation of digital material have aided institutions and agencies to share their information through institutional repositories such as the Namibia University of Science and Technology Ounongo repository, University of Namibia repository, the Open UCT, or the UNESCO digital library, which are open to the public to access information at their fingertips. Social media platforms are frequently used as information sources and instant news because so many people now own smartphones and personal computers with internet access. This has been seen as both a benefit and a barrier to the dissemination of accurate and verified information (Carter and Shields, 2021). However, the advent of social media and digitization makes it simpler to consume information. According to Megan *et al.* (2023), the most popular social media channel for finding nutrition-related information is YouTube. However, Seung-Min (2015) contended that although social media is a useful tool for sharing information and getting feedback, it also contributes to the generation of false information and a deterioration in the dependability of information. In the context of social sharing, online information obtained through social media has become an important factor in consumer decision-making (Liu and Wu, 2020). Additionally, individuals' perceptions of information value in the networked environment are influenced by their level of knowledge and the structure of the network (Dongyoung, 2014). Overall, social media facilitates information sharing, affects consumer decision-making, and influences perceptions of information value.

Popular and Scholarly Types of Information Sources

- Different types of information are designed to meet specific information needs. Types of information sources are categorized as popular and scholarly; some are even called professional. The distinction between popular and scholarly types of information is discussed below:**Popular information sources** are written for a public audience, not for subject experts, often by journalists. However, subject experts also write for popular publication such as newspapers or magazines, blog posts, websites, and social media posts popular sources (Zickel, 2017). Popular media like newspapers and magazines are part of grey literature that is also used for research purposes to find out about contemporary events and interpretations and reactions from the public (Ridley, 2012).
- **Scholarly information sources are sources that are used for academic purposes and written by academics and other experts to contribute to knowledge in a particular field by sharing new research findings, theories, analyses, insights, news, or summaries of current knowledge** (University of Toronto Libraries, 2024). In scholarly information sources, the goals, methods, and results of the author's original research is described. Scholarly information is scrutinized, peer reviewed by subject experts in the fields for validation and approval before being published and presented to the public (Zickel, 2017). However, not all scholarly information sources are peer reviewed, but all peer reviewed sources are scholarly (University of Toronto Libraries, 2024). Examples of scholarly information sources include grey literature which are reports, theses and dissertations, conferences proceedings, popular media, monographs/work in progress papers, specialist information, government reports, industries reports, archives datasets, books, and journals in libraries (Ridley, 2012; Stewart and Kamins, 1993).

Digital Information

Digital information comprising of data, content, and knowledge stored in digital formats like text, images, audio, and video (Sedig and Parsons, 2015), has become a cornerstone of the contemporary information age. This transformative medium expedites the exchange, storage, and retrieval of data. Given these changes, digital information is categorized into different forms, such as textual, visual, audio, and video information (Lokesha and Kumari, 2019). Digital information holds immense significance across various facets of modern life, from education to commerce and healthcare. The digitalization of information has ushered in a new era, with web-based and mobile work processes and services underpinned by intelligent data analysis increasingly shaping high-tech work environments and productivity (Smith, 2017).

Types of Digital Information

(1) **Textual Information: This category encompasses written content, including documents, books, articles, and various textual forms. Examples of its applications include e-books, digital libraries, and online educational resources.**
Video Information: Video content, encompassing movies, YouTube videos, and live streaming, stands as a dominant form of digital information and serves as a potent medium for both entertainment and education.

(2) **Audio Information: Comprising music, podcasts, and other audio files, audio information finds popularity as a source of both information and entertainment through platforms such as audio streaming and podcasts.Visual Information:** Visual information covers images, graphics, and multimedia content, and plays a pivotal role in fields like art, design, and advertising. Platforms such as Pinterest and select social media platforms have become conduits for delivering visual digital information, amplifying the impact of textual content through the stimulation of both hemispheres of the human brain (Mosako and Ngoepe, 2020).

Accessibility of Digital Information

In the realm of digital information accessibility, library users predominantly rely on ever-present internet search engines such as Google, Google Scholar, or Yahoo! as their initial point of entry into the digital information landscape, reflecting the mantra of "information at your fingertips" (Smith, 2017). With a concerted effort to enhance digital information accessibility across continents, several pivotal initiatives have been launched. Firstly, the widespread proliferation of mobile technology has empowered individuals to bypass traditional internet infrastructures, harnessing mobile networks to vastly improve access to digital information, especially in remote areas (Makawia, 2018). Secondly, the establishment of digital libraries and online repositories, exemplified by noteworthy projects like the African Digital Library and African Journals Online (AJOL), has fostered greater accessibility to scholarly content (Tadesse and Ismail, 2020). Additionally, the introduction of electronic governance (e-governance) has resulted in increased government office efficiency, with many countries providing government portals that serve as gateways to public services and information (Mokwena and Ncube, 2019).

There are high hopes that e-governance will improve service delivery. Citizens have expected e-government to improve service delivery and increase public engagement in the decisions that affect them (Nengomasha and Uutoni, 2015). But the challenge remains, when society is not exposed to different types of information or platforms, people will not be able to participate in e-governance, hence the need for equitable access to information for all citizens. According to The Continent (2024), information is power only when it can be accessed by the intended audience. Countries have enacted right-to-information laws designed to ensure that people can access government information so that they can be engaged citizens.

4th Industrial Revolution and Information Accessibility

The advent of the 4th Industrial Revolution, marked by the ascendancy of technologies such as artificial intelligence, blockchain, and the Internet of Things, is reconfiguring the global landscape, Africa included. This transformation underscores a fundamental shift in work, where employees can no longer rely solely on conventional skills training and disciplinary adherence. Proficiency in navigating digital information platforms has become a daily prerequisite in the modern workplace (Spöttl and Windelband, 2021). Consequently, employees must embrace continuous development as an integral facet of their roles, necessitating ongoing on-the-job training, re-skilling, and upskilling to align with the dynamic demands of the 4th Industrial Revolution. The pervasive influence of digitalization, the profusion of digital information, and the proliferation of web-based and mobile work processes, along with services rooted in intelligent data analysis, have gained prominence in reshaping contemporary work environments. This transformation significantly influences the nature of workplaces themselves (Chen and Huang, 2019).

In the realm of knowledge management, the digital revolution has introduced various opportunities and advancements. Firstly, digital inclusion becomes an attainable goal as the 4th Industrial Revolution progresses, extending the potential for more people to engage with the digital economy. Emerging technologies and platforms hold the promise of job creation and economic growth across the continent (Naidu and Winburn, 2019). Secondly, innovations such as 5G networks are poised to elevate the quality and reach of internet connectivity, considerably enhancing the accessibility of digital information (Dzobo and Tengeh, 2020). Finally, advanced data analytics and artificial intelligence can address unique challenges, particularly in fields such as healthcare and agriculture, by furnishing timely, data-driven solutions and expanding information access (Kapungwe and Nkhoma, 2019).

Conclusion

Information is a noun derived from the verb “to inform” and is defined as an organized set of data that can be transferred in different modes and mediums. This entry provides an overview of the types of information, which includes conceptual, directive, empirical, policy, procedural, reciprocal, stimulatory, and subjective information, and their significance in different contexts where they are applied. Additionally, sources of information are categorized into different groups such as: primary, secondary, and tertiary and these categories distinguish the context in which information was created and for whom it was created. Because of the advancement in technology, digital information has become crucial in the contemporary information age. The prominence of digital information serves as a catalyst for advancement across various sectors, including education, commerce, and healthcare. Challenges such as infrastructure limitations, the digital divide, and the importance of digital literacy are some of the hinderance in the digital information sphere. Despite the challenges, the unfolding 4th Industrial Revolution presents exciting prospects globally, offering the potential to level the playing field and foster greater digital inclusion.

See also: Communication Channels. Discovery Systems. Geographic Information Systems. Grey Literature. Sources of Information.

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