

Information Overload: Clarifying the Problem

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Abstract:

This research goal is to clarify three main problems. Firstly, what is the definition of information overload. Secondly, does the abundance of information necessarily cause information overload. Thirdly, to what extent this phenomenon is considered a problem for a human being, especially in the current age when internet data grow exponentially. In this case, it is related to the huge amount of electronic data from information technology. For that, library research using the qualitative method is applied. Several related works of scientists are examined to solve the problem. The result shows that, first, information overload definition is the inability of an information recipient to process excessive information. In the human context, this condition brings about a negative impact on the recipient. Second, the abundance of information is not the only cause of the problem but is also related to the attention investment and the capacity of the recipient. Thus, the issue is not merely about the data quantity. Third, information overload is a subjective experience that is related to the characteristic of the recipient. It means that some may consider it a problem, while others may not. The understanding of the phenomenon helps us to deal with information in the various fields, like education, business, works, health, etc.

Keywords: Information Overload, Information Technology, Internet.

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Introduction

The issue of information overload cannot be separated from the increasing human interaction with information technology devices connected to the internet. A computer, smartphone, or tablet that is connected to the internet for twenty-four hours has become a standard gadget for the present time people. The DataReportal website states that the number of active internet users worldwide in 2019 is close to 4.4 billion (57% of the world total population) or an increase of 77% from the previous five years which was only 2.85 billion users (Kemp, 2019)

However, the emergence of this phenomenon is not solely due to the growth in the number of internet users, but more importantly, is because of the growth of internet data that continues to increase exponentially. Data Never Sleeps 5.0, an infographic released by United States data and software company Domo, reported that 90% of data stored on the internet in 2017 was generated in the last two years (2015-2017). It is estimated 2.5 quintillions (2.5×10^{18}) bytes of new data are generated everyday (Domo, Domo, 2017). The data growth is not slowing down, yet the rate is expected to continue to rise in the coming years.

The rapid growth of data can not be separated from the increasingly easy and fairly small cost of producing content on the global communication network. In addition, the popularity of websites or social media applications has encouraged its users to produce and share more digital content in various formats (texts, photos, sounds, and videos) into social media. Nowadays, posting digital content on social media has become a daily activity of many people around the world. This excitement has a significant impact in driving the growth of digital data. The Never Sleeps 7.0 data infographic released in 2019 reported that there were 511,200 tweets on Twitter, 55,140 photos on Instagram, 231,840 calls on Skype, and 18,100,000 texts posted to the internet every minute (Domo, Domo, 2019).

With the increasing role of information technology in various fields, the problem of information overload needs more attention from scientists since there are relatively infrequent empirical research has been carried out (Suhaimi & Hussin, 2017) This paper objective is to clarify some of the main problems of information overload in relation with human as subjects and objects of information. For that, several questions are needed to be answered. First, what is the general definition of information overload? Second, is the excess of data or information on the internet the only cause of information overload? Is there any other factor that gives rise to information overload? To clarify the problem, we analyze qualitatively several works of scientists discussing the problem like Floridi, Levy, Hoq, etc.

Research Method

This research is library research using a qualitative method to obtain a basic and general description of the information overload phenomenon. We use the method to acquire the basic and general description of this digital-age problem. To comprehend the phenomenon, we examined the works of several researchers working on the issue that is related to the consequence of the rapid growth of internet data, particularly resulted in the last decade. Based on these studies, we investigated several basic problems ranging from the historical background of the emergence of the information overload phenomenon, its definition, and the main factors that may cause a person to experience it. Several internet data sources, particularly from Domo, are presented to depict the rapid growth of internet data. The results of the research are then narrated descriptively.

Result and Analysis

The use of the internet in almost all human activities ranging from education, business, research finance, health, communication, transportation, and entertainment has driven data growth. Previously, the advancement of data production was dominated by organizations such as government, companies, community organizations, or news agencies such as newspapers, magazines, and book publishers. Now, the growth of internet data is also driven by communication activities among individual internet users. The high participation of internet users has resulted in a new genre of internet users called prosumer. A prosumer is a group of users who act as producers and consumers as well. The availability of data duplication tools such as the copy, paste, and share buttons on every application or software enables internet users to create a huge number of new data often takes only a few clicks (Floridi, 2017). This is the reason why internet data grows exponentially and triggers information overload.

Nevertheless, information overload is not an exclusive phenomenon of the nowadays information age. Several decades before the internet emerged and was used massively, the term information overload has already mentioned by Bertram Gross in his work *The Managing of Organizations* (1964). This term was later popularized by Alvin Toffler in his book *Future Shock* (1970). Long before that, despite not using the term information overload, this phenomenon has been predicted to appear due to the rapid growth of books after Johannes Gutenberg invented the printing machine in the mid-15th century (Hoq, 2014). The possibility of the emergence of information overload in the future expressed French philosopher, Denis Diderot in *Encyclopédie*, "...the number of books will grow continually, and one can predict that a time will come when it will be almost as difficult to learn anything from books as from the direct study of the whole universe" (Wikipedia, n.d.).

However, information overload that occurred in the past is quite different from what happened in the current information era. That difference comes from the difference in the perception and utilization of information in the first period is different from the present. In the past, information was perceived as an immeasurable quality, and human attitudes and actions towards information were generally limited to documentation and recording. Meanwhile, in the 20th century, information was perceived as a quantifiable object measured in bits (Rosenberg, 2003). With the support of technology, information transforms into a resource that creates a competitive advantage. It is not only capable of producing a partial benefit but even transforms the whole society. Therefore, information must be managed in the way that people traditionally manage the capital, land, and workers (Allen & Wilson, 2003).

Now, we need to previously discuss the very basic problems: what is the definition of information overload, and what is the nature of it? Although its existence has been accepted, the general definition of information overload has not been agreed upon by scientists. For instance, in business research, there are at least seven definitions of information overload have been given (Roetzel, 2019). Therefore, the author will cite several fairly general definitions and use them as the starting point for discussing this issue further.

The Cambridge Online Dictionary addresses the definition of information overload as a situation in which you receive too much information at one time and cannot think about it in a clear way (Cambridge Dictionary, n.d.). According to Levy, information overload is a condition in which an agent or recipient has—or is exposed to, or is provided with—too much information, and suffers negative consequences as a result (Levy, 2008). From these two definitions, it is quite clear that information overload occurs when a person experiences an excess of information. Both also explain the consequences of this situation—that is, "cannot think it is a clear way" and "suffer negative consequences"—although it still needs further elaboration.

Based on Levy's definition above, it can be concluded that the nature of information overload is about a condition of the recipient (not the situation outside) who is exposed to too much information that hurts the recipient. The negative impact may range from inconvenient feelings to mental illness, like depression, stress, feeling exhausted, and other uncomfortable circumstances due to the inability to perceive (or process) the information received.

In addition, these negative consequences also relate to the inability to take the right choice regarding a particular issue. In the context of one social life, like in education for students or at work for employees, negative consequences mean the failure to complete a given task and the inability to make the right decision. Therefore, there are two basic issues here. They are the excessive of data and its negative consequences. In other words, this issue can be viewed from two different sides. Firstly, from the incoming information itself, and secondly, from the human being side as information recipient.

First, from the information side. In the context of the use of information technology such as in work, business, and education, information overload is not only merely related to the abundance of data in the sense of the quantity of digital data expressed in bits. Hoq mentioned several other causes cause information overload. (Hoq, 2014) Another reason is the variety of information channels that must be accessed. As is known, information is currently accessed through various devices (hardware) and applications (software). This diversity of sources makes information processing a fairly complex activity. Therefore proper information management is needed so that these channels can be used effectively.

In addition, information overload is also related to the amount of irrelevant data. The root of the problem lies in the role of the internet which is designed as a repository of information that enables to store of all kinds of information practically limitless. Therefore, adding "unlimited" data is inevitable. This is where the problem begins. The huge number of data makes the evaluation process to find the right data more difficult. Some search engine applications such as Google, Yahoo, or Bing have been created to overcome these obstacles. Although the ability of these applications to track information continues to increase, discovering

the right information still requires human judgment. Information overload can also arise due to a lack of time available to process data.

Second, from the human side as the information recipient. Empirical experience shows that the emergence of this phenomenon is not solely due to the abundance of information. The “overload” term is not only about how much information a recipient receives, but also about his response towards the incoming information. As long as he does not pay any attention to it, or consider it unimportant, the recipient will not experience information overload. Therefore, there must be other conditions that stimulate information overload. Levy said that one of the conditions is that there must be an attention investment on the information received. (Levy, 2008)

The amount or level of attention invested by an information recipient depends on the importance or significance of the information received. The more important the information, the greater the attention investment will be, and vice versa. Internet users particularly those who use social media applications will not be pressured just because of the many notifications on their accounts, as long as there is no interest for them to perceive all of the information. People who actively use the internet, particularly those who hourly access social media such as Facebook, Twitter, Instagram, Whatsapp Group, and others may not necessarily experience information overload even though they are bombarded with various kinds of information all the time. It is similar to reading through billboards of ads that stand on the side of a city big roads.

Conversely, it is important for high lever employers like managers of a nowadays large company to pay attention to all information relating to their work. Thus, in this case, the attention investment is in general high. That is why the growth of information that exceeds the processing capacity establishes the occurrence of information overload. There is a lot of employment in the 21st century that demands a lot of utilization of information stored on the company's local network or the internet. This situation requires proper management of information. However, utilization of various information management systems may indeed help, but the very high data growth makes this application soon be obsolete. Thus the requirement for the new improved method for managing the information continues to exist. This makes information overload an important issue in the digital world.

In addition to attention investment, there is also another subjective factor called recipient capacity. The word *capacity* here means the recipient's ability to process information in a unit of time. Empirically, each person's capacity to process and manage information depends on various factors, such as intelligence, age, education, experience, health, and others. It means that too much for someone is not necessarily too much for others. Therefore, information overload is a subjective experience of each person.

Conclusion

The rapid growth of information on the internet has given rise to information overload. In general, information overload is the inability of an information recipient to process excessive information. In the context of information technology, information overload is caused by a huge amount of irrelevant channels and digital data, particularly data from the internet. The scientists recognize the phenomenon and consider it unfavorable, and even harmful at a certain level. Recent research confirms that the phenomenon may hurt people like stress, fatigue, depression, and other mental illness. Furthermore, information overload also leads to a negative impact on one social life. It obstructs him/her to make decisions and finishing his/her tasks. Recent studies address that this issue is not solely related to the quantity of information expressed in bits. It means that this problem should be seen from two sides, namely the information itself and human beings as the information recipients. From the human being's side as a recipient, information overload relates to the attention investment and the capacity of the information recipient. For that reason, information overload is a subjective experience that depends on the characteristic of the recipient. Hopefully, the understanding of the information overload contributes toward better information management in the various fields, like education, business, works, health, etc.

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