The Negative Psychological Effects of Information Overload

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Abstract. Information overload (IO) is a state in which Information is beyond an individual's ability to accept, process, and respond. The human brain is limited to information processing capacity; when the input and output of Information mismatch, the individual will feel overwhelmed by tons of Information, resulting in anxiety, depression, and out of controlled psychological state. The idea of information overload has a long history. As early as the last century, it was applied by many scholars in enterprise management. The main consequence of information overload is the decline of decision-making quality and efficiency; decision-makers often need to consume more time and cognitive resources to deal with the task. In addition, the impact of information overload on mental health is often mentioned. Especially in the Internet era, people can receive more Information in a day than those who lived a hundred years ago combined in a lifetime. Massive amounts of instant Information build up to a state of life that requires a constant response; prolonged exposure to information overload can lead to personal stress, depression, and social media fatigue. It can be seen that information overload not only hurts people's work but also harms their physical and psychological health. Therefore, this paper will systematically describe the negative impact of information overload on individuals, especially psychological health, and provide some feasible suggestions.

Keywords: Information overload, Multitasking, Mental health, Cognitive overload.

1. Introduction

Information overload (IO) is a state in which Information is beyond people's ability to accept, process, and respond. Numerous studies have shown that information overload can negatively affect physical and mental health, such as suffering from stress, anxiety, life dissatisfaction, and loss of control [1]. Individuals may find it hard to process too much Information they receive because it demands sustained cognitive effort, and these resources are limited [2]. Excess Information will make a person feel stressed, incontrollable, overloaded, and be all adrift [3]. IO not only declines the efficiency of access to Information and the decision-making quality but is also detrimental to people's physical and psychological health, leading to negative consequences such as anxiety, depression, and social fatigue [4]. Information overload has momentous effects on productivity and mental health. Human beings are generally limited in their capacity to deal with Information; when they are faced with too much content, the quality of their decision-making is affected [5]. Specifically, the brain can only complete one task at a time, while those who think they can multitask just keep constantly switching between tasks. Changing between different tasks requires excess cognitive resources. The more energy a person uses on one level, the less energy he uses on other levels. In the case of co-existing or competitive tasks, people may not have sufficient time and cognitive resources to meet these needs. As a result, individuals may be overwhelmed by incoming flows of Information that can not be processed and responded to by available resources, thus creating a sense of information overload [6]. Information overload indicates that an individual's information processing needs for the environment are not being met. This feeling, in turn, creates stress, which has been identified as a critical predictor of depression [6]. In addition, information overload leads to anxiety through information-induced uncertainty. For example, in the COVID-19 epidemic, the bulk of the outbreak Information is a cognitive load and involves the associated impact of much outbreak-related content. The stress and miscellaneous uncertainties they bring will lead to people's worry and anxiety; individuals who perceive a high level of information overload will have a greater sense of uncertainty [3]. Fear of missing out on the correct Information can lead to anxiety when an individual may not know all the options, and it is impossible to compare each option's benefits thoroughly. Therefore,

this paper will systematically describe the psychological effects of information overload, how IO may lead to practical problems and provide some feasible suggestions.

2. The Definition of Information Overload

Information overload often referred to as a state that occurs when a decision-maker must be confronted with Information beyond his or her ability to process it [3]. Humans usually have limited information processing ability, and individuals will undergo cognitive processing activity when receiving and processing messages. When the amount of input and output does not match, overmuch Information can make people feel incontrollable, depressed, stressed, and overwhelmed [3]. A long-term information overload environment will negatively affect an individual's mental health. The concept of information overload (IO) is longstanding. Scholars Meier (1962), Gross (1962), Boulding (1966), and Ackoff (1967) cite this phrase, though without an accompanying definition; later, Bawden (1999) gives a more precise definition: he argues that there is no single conception of IO, and that, but it can be summed up as "When information can be useful, and the information received becomes a hindrance rather than a help" [7]. Overfull Information and options can leave an individual feeling lost and confused and incapable of making an appropriate decision [8]. In addition, perceived IO is defined as "Psychological stress that occurs when a person's perceived environmental needs exceed his or her perceived ability to cope" [9]. Specifically, when the brain has overfull Information to process and understand, so much Information had obtained that it cannot deduce the exact details it needs. The "Analysis paralysis" proposed by scholars Lewis and the "Declining quality of decision makers' performance" proposed by Jacoby are two crucial IO consequences of maintaining consistency over time. As the number of information increases, the line between valuable and distracting information blurs [10]. Some say the internet has undoubtedly become a major cause of IO, while others question whether it has exacerbated the problem and say it predates the internet. Currently, research papers on IO mainly come from western hemisphere countries [11]. However, an increasing number of regions and organizations are starting to pay attention to this area, especially concerning inefficiency and psychological effects. For example, the Chinese government has launched media literacy campaigns to decline the risk of information overload, and technology giant Tencent has promoted "Social good technology" programs and innovative solutions to change information overload [12]. Thus, the impact of information overload has become a global community increasingly concerned about the topic. IO harms individuals' physical and psychological health, bringing practical problems in social, occupational, and life help-seeking aspects.Please remember that all the papers must be in English and without orthographic errors.

3. Cognitive Overload and Efficiency Reduction

Perceived information overload is defined as a psychological experience of "Feeling burdened with massive information" [12]; it is a feeling overwhelmed by input beyond one's cognitive capacity. According to the cognitive overload method, the human brain is limited by information processing capacity [13]. When an individual needs to process Information that surpassing they can handle, the brain will try to separate valuable Information from unnecessary Information. When lots of indistinguishable Information goes into the brain, the person needs constant cognitive stretching and more time to consume it; these higher time costs also affect work efficiency. Therefore, perceived IO leads to a negative psychological assessment of one's work and abilities [11]. IO's mental and physical aftereffects are massive and can have various individual, social, and organizational effects. Basex's research shows that this is a big problem, costing the US economy about $900bn a year. The most common effect of IO in patients is stress. Lewis found that two-thirds of business managers suffer IO-related stress and job satisfaction loss, while one-third of business managers suffer from poor health due to stress [7]. Specifically, the primary mediators of perceived IO, reduced efficiency, and adverse psychological effects are multitasking. Distraction and impatience due to excessive mental

stimulation, in extreme cases, IO can be detrimental to health, such as attention-deficit characteristics [14]. Kirsch determined that cognitive overload is when information overload mixes into multitasking and interruption. In the Web 2.0 era, multitasking and task-switching are seen as common. Social connections on smartphones normalize expectations of permanent connectivity and bring about an "Always open" culture that requires individuals to be on call and to respond immediately to others; Users' cognitive resource depletion and social media fatigue may be a consequence [12]. In addition, social use requires multitasking and task switching, with an endless stream of Information diverting individuals' attention from major tasks to minor tasks; this is a significant cause of inefficiency [15]. Specifically, the brain can only process one task at a time, and when people constantly switch between tasks, it requires relocation to another task, which leads to unnecessary waste of cognitive resources. Moreover, the constant stream of Information provided by smartphones can cause various interruptions, leading to habitual checks and compulsive use. Even if people can limit smartphone use, this rapidly growing body of Information produces new anxieties, such as the "Afraid of missing," leading to a decline in mental health [12]. Individuals with high levels of perceived IO may find it challenging to balance work and life; long-term exposure to an immediate response to Information can negatively affect their overall health.

4. Psychological Effects of Perceived IO in Working and Socializing

Wurman, the Father of information architecture, argued that when the quantity of Information gained outstrips the capacity to process it, excess Information accumulates, leading to stress and over-stimulation, ultimately leading to anxiety [3]. Information anxiety, a terminology created by Saul Wurman, is often referred to as a stressful state caused by incapable to access, comprehending, or use necessary Information. Perceived IO can cause individuals to feel information anxiety, and the wide choice of Information can increase uncertainty, "Not being able to compare all options" and "The fear of missing out on useful information" will consume more time and cause more significant psychological stress. Nearly half of those polled by Reuters for the "Die for information" statistic believe essential decisions are delayed and adversely affected by too much information [6]. Existing research has demonstrated that in stressful situations, the more stress people experience, the fewer positive corresponding measures are employed; conversely, the fewer positive corresponding methods, the higher the level of anxiety [3]. As widely studied by Csikszentmihalyi, a fundamental condition of happiness is that the challenges in a situation match an individual's abilities; whenever the challenges are greater than the capacities, happiness is replaced by being out of control and anxiety. The result for the individual is increased stress and the accompanying physical, psychological and social problems [16]. The longer people perceive IO, the greater its negative impact on physical and mental health. A worldwide survey found that over half of managers are stressed by Information overload [16]. Psychologist Davy Lewis analyzed the findings and coined the term "Information fatigue syndrome" to describe the resulting symptoms; they include anxiety, poor decision-making, memory and memory difficulties, shorter attention spans, lower job satisfaction, and strained relationships with co-workers [17]. The human brain's ability to process Information is limited and varies from person to person. Although making the right decision is especially important for every decision-maker, perceived IO can lead to increased stress and fear among decision-makers -- fear of making the wrong decision, failing to systematically consider all options, or not finding an option to solve all problems perfectly.

Much literature has shown that perceived IO can lead to various adverse outcomes, such as psychological stress, fatigue, anxiety, negative impact, or decreased job performance [6, 18]. Other researchers have shown that excessive use of social networks can result in social media fatigue [12]. Social media fatigue was interpreted as a negative emotional response to social networks, such as boredom, fatigue, and burnout; findings from all surveys are negative aspects, often associated with symptoms of a depressive state [6]. Therefore, the results suggest that there may be a notable association between depressive symptoms and IO. In the background of social media, "Afraid to

miss," "Overuse," and "Overload" are stressors (e.g., stress, exhaustion, regret, or dissatisfaction) that affect an individual's mood and attitude toward social media. This, in turn, leads to multifarious negative outcomes, such as a decline in work or academic performance and discontinuous social media use intentions; consistent with previous studies, there is a positive correlation between social overload and social media exhaustion [2, 19]. Social media has changed daily communication from face-to-face to online, and individuals must deal with others' messages, gossip on social media, and third-party ads. Social media fatigue can increase if users encounter more Information than they can handle, and excessive social pressure and information overload drive users away from social software.

5. Feasibility Recommendations

As mentioned earlier, multitasking is the main contributing factor to link efficiency reduction and anxiety. The spread of social media and the internet means that users can switch between tasks on a single device, and people may allocate their cognitive resources to a secondary task unrelated to the main task. Then, email or SMS messages alert could lead to users habitually checking and compulsive smartphone use [12]. However, to accomplish the primary assignment, people need to allocate their cognitive resources back to that assignment, which may demand extra resources. As a result, smartphone use may inhibit or slow down the completion of major tasks, resulting in situations where there seem to be too many tasks that need to be done simultaneously [6]. For anxiety caused by multitasking, this article suggests that users use The Pomodoro Technique in their daily work and study Pomodoro Technique. The Pomodoro Technique is a time management method that Francesco Cirillo created in 1992 that is much more subtle than GTD. The principle is simple: work for 25 minutes (counting as a tomato time) and use the smartphone for no more than 5 minutes. The rest time is increased to 15 minutes after every four tomato hours to cycle the appropriate work cycle [20]. During tomato time, users can mute email notifications or put their smartphones away to force cognitive resources to focus on primary tasks. By adjusting the habit of constantly switching tasks can effectively reduce the impact of IO on mental health. Some companies and organizations have begun to focus on the problem of information overload in the workplace and have begun to develop intervention plans to help employees in their efforts to manage increased electronic communications and increase efficiency. For example, Intel recently implemented two pilot projects to minimize information disruption to the workplace. One project focused on limiting email on certain days and encouraging co-workers to talk face-to-face or on the phone. Another task, called "Quiet Time," encourages employees to stop electronic communication at a specified time, set their email and instant messenger to "Offline," and forward calls to voicemail [21]. Another widely used way to improve IO is to improve information literacy. Information literacy is interpreted as "Knowing when and why you need information, where to find it, and how to evaluate, use, and communicate it in an ethical manner" [7]. Improving information literacy will reduce IO -- consistent with Gourdine's assertion (2001) that information literacy is generally considered a therapeutic approach. In previous studies, the role of technology was most frequently discussed in older age groups. This suggests that there may be a link between age and perceived IO: cognitive decline in older adults and insufficient ability to search for information [7]. Improving information literacy can be promoted through training by enterprises or social welfare organizations. In order to popularize to the public the relevant content of access to and analysis of Information, such as the use of search engines and social software, and some frequently used official reporting sites, allows users to find valuable Information more accurately and quickly, reducing unnecessary time costs and psychological burdens. In addition, according to the theory of large-scale emotional contagion through social networks, emotions can spread and affect others through social networks [3]. For example, negative messages about the COVID-19 epidemic on multifarious media platforms contain pessimistic emotions transmitted through the media to the audience, thus exacerbating the adverse mental reactions of people. Therefore, the relevant media regulatory departments should also strengthen the supervision of internet information and filter out

untrue Information and the deluge of false advertisements, avoiding the stress and uncertainty caused by negative Information to increase public concern and anxiety.

6. Conclusions

It has been shown that there is a significant positive correlation between information overload and anxiety and depression. As mentioned earlier, individuals with higher IO levels are more likely to experience negative psychological states such as anxiety, dissatisfaction with their lives, and avoidance of social interaction. In addition, there are often mentioned symptoms, including impaired concentration, impatience, loss of ability to meditate, and other series consequences caused by IO. It can be seen that the negative effect of IO on individual psychological health is enormous. However, people are often unaware of the psychological impact caused by IO until specific symptoms affect physical health and real life. In addition, reducing multitasking habits is a priority factor in improving IO. Working and socializing in the modern world requires people to think of multitasking as the norm; the constant flow of Information creates too much mental stimulation for individuals, and constantly switching tasks consumes additional cognitive resources and wastes more time. Decreased productivity and attention deficit impatience may be the main contributing factors to increased anxiety and social fatigue. Therefore, to effectively improve the negative psychological impact caused by IO, people can adjust the habit of multitasking switching, and improve their information literacy. Moreover, there were very different views about the association between individuals' age and IO in previous studies. Some scholars believe that older people are more affected by IO due to cognitive deterioration. The ability of older persons to accomplish major tasks is more susceptible than that of younger persons. By contrast, other scholars believe that the elderly are less affected by IO. In the Internet age, older people are more likely than younger people to use newspapers, magazines, and television to receive Information, all of which control IO at a higher level than the internet or email. Therefore, there is no consistent conclusion about the effect of IO on different ages and populations. In addition, the current IO-related surveys are mainly focused on the western hemisphere countries. Due to different cultural backgrounds, living habits, and media policies, East Asian subjects still need enough survey data to support their perception of IO and its effects. Therefore, in future related research, the academic community needs to pay more attention to the above.

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