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*Price Information Overload as an Indirect Consequence of Omnibus  
Directive Implementation – a Theoretical Approach to PIO*

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**Abstract**

**Theoretical background:** Information overload (IO) occurs when information flow exceeds the information needs. Nowadays IO is perceived as a permanent feature of modern society. Undoubtedly, IO is a negative phenomenon due to its negative impact on consumer behaviour. Price information overload (PIO) is a specific type of IO. PIO is a phenomenon that can arise due to a change in EU law. The Omnibus Directive, implemented in Poland as an EU member state, has created a new requirement for sellers to communicate promotional prices. This requirement includes the lowest price in force 30 days before introducing the price reduction (known as the omnibus price). PIO occurs when there is an excess of mandatory promotional price information provided to the buyer.

**Purpose of the article:** This article attempts to introduce the concept of price information overload, which has not been previously discussed in the marketing literature to the best of the author's knowledge. The paper also highlights the indirect consequences of implementing the Omnibus Directive in an EU member state.

**Research methods:** This article introduces a new type of information overload called "price information overload" (PIO) and extends the concept of information overload (IO). The article is a theoretical paper

that presents PIO's essence and some graphical representations. The author, who specializes in pricing, developed the PIO concept by starting with the scientific literature on IO.

**Main findings:** The author posits that the Omnibus Directive does not inherently pose a risk of PIO, but rather that sellers may inadvertently contribute to it through their pricing practices. The PIO concept highlights the relevance and actuality of the IO issue in communicating promotional prices. The idea of being overwhelmed with too much price information is a practical concern. Consequently, the author suggests that a potential deluge of price information be regarded as an element of a nuanced system of price communication.

## Introduction

Information plays a crucial role in the business process. However, with the increasing volume of available information, it becomes overwhelming for individuals and organizations to process. Undoubtedly, the increasing importance of information is accompanied by the risk of information overload creating a crucial challenge for both people and organizations (Klausegger et al., 2007). Information overload (IO) is seen as a potential problem for society due to the rapid growth of information being produced (Jackson & Farzaneh, 2012). There is a general agreement that information overload is an important topic. By some researchers, information overload is perceived as one of the common "information pathologies" that is linked with a general paradox of choice (Bawden & Robinson, 2009).

One mandatory piece of information a seller must provide to potential buyers is the product price. Pricing is a key component of any marketing strategy (Grevall & Roggeveen, 2011). The extensive scientific literature on the reference price importance proves the effectiveness of presenting more than one price tag to emphasize the offered advantage. Caution is required, however. This paper extends the concept of IO by introducing a new type of information overload which is price information overload (PIO). The goal of the article is to present the essence of this specific type of information overload. A circumstance that justifies the presentation of PIO is the implementation of the Omnibus Directive in Poland. As a member state of the European Union, Poland was obliged to implement a Directive that took effect in Polish law at the beginning of 2023. This Directive obliges sellers to provide specific information when promoting prices. The mandatory information that must accompany the promotional price is the lowest price that was in effect for 30 days before the introduction of the price reduction. This lowest price is commonly referred to as the "omnibus price". Almost every time<sup>1</sup> a discounted price is presented it must be supplemented with information about the omnibus price.

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<sup>1</sup> The amended Act (Ustawa o informowaniu o cenach towarów i usług z 9 maja 2014 roku; Dz.U.2023.168 t.j.) defines some exceptions to the requirement to present the lowest price in force during 30 days prior the price reduction.

This article is theoretical. The author is familiar with the scientific regime of preparing a conceptual article (Jaakkola, 2020), so it is not labeled as such. This article attempts to introduce the concept of price information overload, which has not been previously discussed in the marketing literature to the best of the author's knowledge. The paper also highlights the indirect consequences of implementing the Omnibus Directive in an EU member state. It also highlights the indirect consequences of implementing the Omnibus Directive in an EU member state. The article sheds light on the issue of price communication as a topic that is increasingly relevant in practice but has not yet been sufficiently studied (Krämer, 2020).

The paper proceeds as follows: the next section discusses information overload, its implementation in different marketing and non-marketing areas, and some negative consequences. The section that follows presents the essence of PIO with some graphic explanations. The paper ends with a general discussion and conclusions.

## Literature review

Some researchers noticed the first signs of IO far back in history mentioning the writer of Ecclesiastes (Bawden et al., 1999; Blair, 2011). Nowadays IO is perceived as a permanent feature of modern society (Gomez-Rodriguez et al., 2014). As the researchers indicate, interest in IO peaked in the 1980s and 1990s, the following decades were characterized by a lower interest in this issue (Roetzel, 2019). The literature reveals that although the problem of IO has existed for more than 50 years (Mostak & Hoq, 2014), however, in recent years the problem has become more widely recognized and experienced (Edmunds & Morris, 2000) due to rapid innovations in information technology. Both the rise of the information-based economy and social media are indicated as phenomena explaining the IO growth (Belabbes et al., 2023). Consumers are consequently faced with massive quantities of various types of information that are accessible via a variety of media (Shachaf et al., 2016). Information overload is a topic that is relevant to many disciplines, including medicine, social sciences, marketing, computer science, education, and psychology (Edmunds & Morris, 2000). The COVID-19 pandemic seemed to be a separate significant factor intensifying the IO phenomenon (Honora et al., 2022; Breyton et al., 2023; Baerg & Bruchmann, 2022; Liu et al., 2021) which is part of the extensive literature on the importance of IO in the treatment process (Swar et al., 2017; Obamiro & Lee, 2019; Bink & Corrigan, 2022; van Ravensteijn et al., 2023). Information overload is well described in various interesting marketing contexts such as virtual team cooperation (Amponsah et al., 2022; Li & Yee, 2023; Müller et al., 2023), job performance (Karr-Wisniewski & Lu, 2010; Eliyana et al., 2020), social media (Sasaki et al., 2016; Matthes et al., 2020; Gunaratne et al., 2020; Pang, 2021; Wu & Zheng, 2023), online/mobile buying (Chen et al., 2009; Soto-Acosta et al., 2014; Fang et al., 2021), or website structure (Chen, 2018).

According to Miller (1956), the human brain can process only a limited volume of information within a given time and the IO problem should be linked with a quantity of information exceeding human-information processing capacities. To define the concept of IO, two issues should be pointed out. The first one refers to the numerous synonyms<sup>2</sup> of this term, and the second issue is the unquestionable difficulty in formulating one general definition of IO (Bowden et al., 1999; Bowden & Robinson, 2020). Although for some authors communication overload refers to a slightly different problem than information overload (Eliyana et al., 2020), usually these two terms are treated as synonyms.

It is worth providing a theoretical framework for IO when analyzing the issue. Cognitive load theory by Atkinson and Shiffrin (1968) suggests that the human working memory is limited and information overload occurs when the amount of information exceeds the working memory of the person receiving it (Graf & Antoni, 2021). Arnold et al. (2023) demonstrated the value of Daft and Lengel's (1986) media richness theory which highlights the information processing capabilities of media in various communication settings and their inherent communication requirements. In their initial paper, Daft and Lengel (1983) referred to the concept of information richness, which was later known as media richness. Information richness, which is a key term in that theory, should be considered concerning information overload. According to Daft and Lengel (1986, p. 560), information richness refers to the extent to which information can change understanding in a given time interval. In addition to the information itself, the various possible communication channels may also impact the information richness (Arnold et al., 2023). Thus, it may be beneficial to examine differences in the PIO scale based on the sales channel in a multi-channel sales environment. The concept of information overload can be also explored by drawing on resource-matching theory (Anand & Sternthal, 1989) which explains that the optimal decision-making process requires a balance between the available cognitive resources and the mental resources required for the task (Jin et al., 2019). To improve the efficiency and effectiveness of decision-making, it is important to match current cognitive resources and required mental resources. Failure to do so can result in poor decision performance (Mantel & Kellaris, 2003).

Overload of information takes place when information flow exceeds the information needs (Eppler & Mengis, 2004). It refers to a condition in which the volume of novel information exceeds the consumers' capacity to process in a certain unit of time (Bermes, 2021). As stated by Mahdi (2020), the concept of information overload refers to the difficulty of selecting relevant information whenever the content and sources are increased. Bowden et al. (1999, p. 249) introduced a simple but still

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<sup>2</sup> Such as cognitive overload, sensory overload, communication overload, knowledge overload, and information fatigue syndrome (Eppler & Mengis, 2004) as well as information overabundance, infobesity, infoglut, data smog, information pollution, information fatigue, social media fatigue, social media overload, information anxiety, library anxiety, info stress, intoxication, reading overload, information violence, and information assault (Bowden & Robinson, 2020).

useful explanation that information overload occurs when “information received becomes a hindrance rather than a help when the information is potentially useful”. Subsequent definitions in more recent publications seemed to provide similar interpretations (Benselin & Ragsdell, 2019). Explanations of the phenomenon of IO come from psychology and marketing. Researchers have noted its objective and subjective nature (Klausegger et al., 2007). Subjective IO refers to “subjective experience of the insufficiency of time needed to make effective use of information resources available in specific situations” (Lloyd & Hicks, 2022). Chapman et al. (2019) indicated, about investors’ behaviour, that information overload arises not only because of increased disclosure but also because decision-makers have limited time to process the information they receive. Undoubtedly, IO is a negative phenomenon due to its negative impact on consumer behaviour (Sun et al., 2022). Due to the thematic area of the article, it is worth pointing out the following issues:

- IO hurts customer purchase intention (Soto-Acosta et al., 2014), causes the buying decision to be more difficult to make (Vogrincic-Haselbacher et al., 2021), prolongs decision-making time and damages the decision performance (Che et al., 2019),
- IO creates some negative emotions such as anxiety, stress, and dissatisfaction (Hu & Krishen, 2019),
- IO leads to poor decision-making and dysfunctional performance (Hu & Krishen, 2019),
- IO results in a decrease in interest in a specific issue (Dinu et al., 2024),
- IO makes prior information harder to recall (Hu & Krishen, 2019),
- IO affects the ability to set priorities (Hu & Krishen, 2019),
- IO creates confusion (Chauhan & Sagar, 2023; Hu & Krishen, 2019),
- IO causes a sense of exhaustion and fatigue due to energy usage (Pradhan, 2022; Zhou & Xie, 2023) or even depression or emotional tensions (Dhir et al., 2018),
- IO prevents from processing information efficiently (Wu & Zhneg, 2023) and creates fear of missing out on information (Dhir et al., 2018),
- IO creates higher perceived risk (Soto-Acosta et al., 2014),
- IO negatively impacts decision efficiency (Klausegger et al., 2007) and its quality (Soto-Acosta et al., 2014),
- IO impedes important information identification due to a large amount of information (Vogrincic-Haselbacher et al., 2021).

## Research methods

This paper is a theoretical piece that presents the concept of PIO, along with some graphical representations. The focus of the paper is on one particular type of information overload, which is PIO. The author, who specializes in pricing, developed the PIO concept by starting with the scientific literature on IO. Price is defined as the

number someone puts on a product to help consumers decide whether or not to buy it (Paczkowski, 2019). According to Simon (2015) as well as Simon and Fassnacht (2019), price is the amount of money a buyer must pay for one unit of a product. There are many other definitions of price, but they all refer to the numerical nature of price, which is essentially numerical information. Price will always be a numerical value regardless of its presentation, though there are many excellent papers on ways of presenting prices (e.g. Coulter & Coulter, 2005; Coulter & Norberg, 2009; Feng et al., 2017; Gong et al., 2019; DelVecchio et al., 2020; Jang et al., 2020; Hung et al., 2021).

## Results

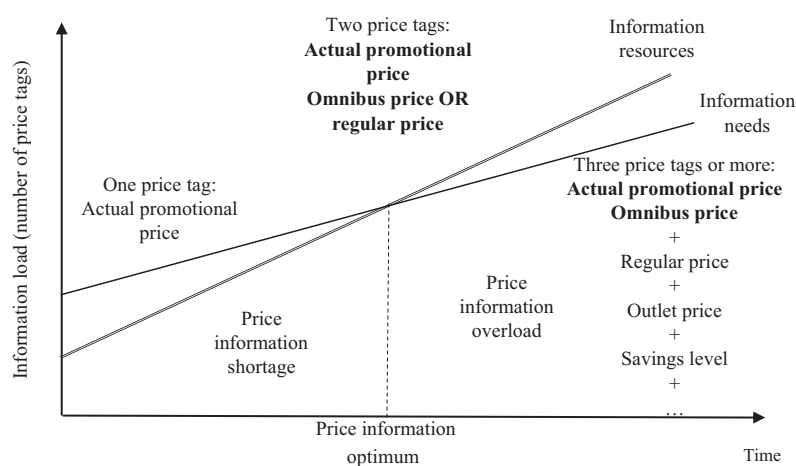
The relationship between information load and information processing is usually described as an inverted *U* curve that illustrates the consequences of IO: the quantity of information increases until it reaches a point where its utility starts decreasing (Soto-Acosta et al., 2014). Information overload occurs when decision-makers face a level of information that is greater than their information processing capacity (Roetzheim, 2019). Information availability has a positive relationship with performance until the optimum level is achieved (Delpechitre et al., 2019).

The author introduces the idea of PIO by analogy to the concept of the general IO. *Price information overload is a situation where there is an excess of price information (price tags), making it challenging to evaluate the attractiveness of a specific product's price.* This can lead to difficulties in selecting relevant price information. PIO is essentially linked to the concept of a reference price. Price evaluations are an important factor in consumer decision-making. The concept of reference price helps to understand how prices are evaluated (Niedrich et al., 2001). The significance of having a reference point when evaluating the attractiveness of a price is widely recognized in existing research (Chen et al., 2019; Hu et al., 2016; Zhang et al., 2019; Lowe et al., 2014). Reference price is defined as a standard against which the purchase price of a product is weighted (Monroe, 1973). It is the price using to compare the price of the product considered for purchasing by consumers (Popescu & Wu, 2007). In light of the literature, the reference price can have many different bases (Bondos & Lipowski, 2022).

In the Introduction section, it was mentioned that the Omnibus Directive has mandated an information requirement for sellers who offer price promotions. This requirement entails that alongside the promotional price, the lowest price in effect 30 days before the price reduction must be displayed. Therefore, a new reference price for the promotional price (so-called omnibus price) has been created under EU law.

It would be helpful to have a graphical representation to explain the concept of PIO – Figure 1 and Figure 2. If a product has only one price which is a promotional price, it may not be enough for a buyer to make an informed decision on whether it is a good deal or not. This is called a shortage of price information. Ideally, a buyer should

be provided with the actual price of the product as well as a useful reference point. Before the Omnibus Directive, this reference point was called the “crossed-out price” (when it refers to the regular price before the promotion). Under this Directive, it is now called the “omnibus price” (when it refers to the lowest price in force 30 days before introducing the price reduction). Sometimes, a seller may include voluntary reference prices such as a regular price, outlet price, or price with a discount code alongside the mandatory omnibus price. Such several price tags can create price information overload.



**Figure 1.** Needs and price information load – the concept of price information overload

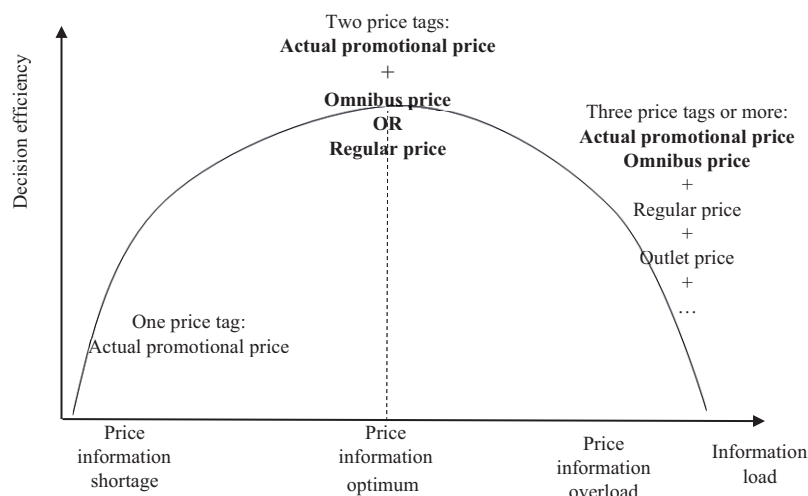
Source: Author’s own study based on (Wrzosek, 2005, p. 164).

Therefore, in the author’s opinion, the Omnibus Directive does not automatically generate PIO. This new legal requirement defines (indicates) the basis for assessing the price attractiveness of the discounted offer – the obligatory reference point (price) is the omnibus price. From the legislator’s perspective, the omnibus price is a sufficient (desirable) reference point in assessing the price attractiveness of a discounted offer.<sup>3</sup> However, the sellers who do not want to resign from beneficial reference points (prices) may unintentionally contribute to this unfavourable phenomenon (PIO).

A related issue is information avoidance which is a common issue where users intentionally ignore or avoid certain information due to various reasons such as lack of time, effort, knowledge, or personal interests (Guo et al., 2020). One important research question is whether buyers can ignore certain price tags and what potential impact information avoidance has on PIO risk.

<sup>3</sup> According to the Office (UOKiK, 2023a), “the lowest price from 30 days before the discount is now one of the most important pieces of information for consumers. It is the basis to which the current promotion must refer. The obligation to provide it is intended to make it easier for buyers to make purchasing decisions and verify the actual price advantage”.





**Figure 2.** Price information load and decision efficiency

Source: Author's own study based on (Wrzosek, 2005, p. 164).

Based on Figure 2, it can be observed that the presence of PIO leads to a decline in decision-making efficiency, which is well-supported by existing research on general price information. The vast amount of potentially useful and relevant data available can hinder an individual's ability to effectively utilize all of it. Having a broad spectrum of information is crucial for effective and efficient activities (Grubor, 2009). It is essential to note that the quality of information is just as crucial as its quantity (Bawden & Robinson, 2009) or even more so. In Figure 2, both cases that are not optimal are unsatisfactory. However, each case shows a different direction of change in the level of decision efficiency – one increasing and the other decreasing. Traditionally, uncertainty has been defined as the difference between the available and required information. However, with the advent of vast amounts of data, there is often an excess of information available. Instead of exceeding the optimal point, the information should stop at the optimal level to maximize decision effectiveness.

## Discussions

Despite the delay in implementing the Omnibus Directive in Poland, this new regulation has brought significant changes to the existing practices of communicating promotional prices. In the first few weeks of the Directive being in force, the Office of Competition and Consumer Protection (*Urząd Ochrony Konkurencji i Konsumentów*, UOKiK) focused on educating the market, announcing further inspections and more severe consequences for sellers in case of any noticed irregularities. The UOKiK monitors the market systematically to ensure the correct implementation of the



new regulations while taking into account the interest of the weaker party in each transaction (consumers). It is worth noting that the UOKiK attempts to clarify any doubts regarding the implementation of the Omnibus Directive, which is reflected in substantive publications of the UOKiK (2023b). The UOKiK inspection in early 2023 uncovered several irregularities, primarily related to the presentation of price information required by the new regulation. The following issues have been identified regarding the presentation of sale prices by retailers:

- some retailers display the current sale price alongside a crossed-out price but do not specify what the crossed-out price represents,
- other retailers provide both the current sale price and the crossed-out price, but only explain that the crossed-out price is the lowest price of the product from 30 days before the price reduction after the user clicks on a drop-down menu,
- some retailers use reference values other than the lowest price from 30 days before the discount when presenting discounts (crossed-out price) and omitting the lowest price altogether,
- finally, some retailers present information on the lowest price applicable in the 30 days before the price reduction in an illegible way, such as using unclear fonts, colours, or contrast.

Retailers may have misrepresented promotional offers due to their lack of awareness of the new regulations or as a conscious effort to limit the negative consequences of implementing the Omnibus Directive. This Directive requires increased price transparency, which could make price promotions less attractive. While the reference price does not always benefit retailers, they should be cautious about the potential threats arising from avoiding this regulation. One such risk is the overload of price information. Some sellers have abandoned price reductions and opted for other practices, such as offering a lower price when buying two or more products, which are not affected by the Directive.

## Conclusions

Retailers and manufacturers rely on price promotions to attract and retain customers. The article presents the concept of PIO in the case of price promotion under the Omnibus Directive. Price promotions are extremely popular thus the Omnibus Directive should be implemented by so many sellers. It seems that the idea of being overwhelmed with too much price information is a practical concern. The author believes that a possible overload of price information should be viewed as a part of a complex system of price communication. Historically, sellers have prioritized the presentation of prices in various formats, often without considering the adverse consequences of exhibiting an excessive number of prices for a single product. While they have gained knowledge regarding the efficacy of reference prices, they must acknowledge the potential hazards and take a moment to assess them.

According to the author of this article, while the concept of PIO warrants additional empirical research for confirmation, it is also deserving of greater consideration. The author maintains that the theoretical construct of PIO is valuable and underscores the importance of IO in the domain of price communication.

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