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Information Cocoons in Social Commerce: A Study of Causes, Effects and Proposed Interventions

Xuchang Zhu

Department of Management, The London School of Economics and Political Science, London, UK
XuchangZhu_LSE@163.com

Abstract. In social commerce, a platform that integrates social and transactional functions, the information cocoon has been identified as an impactful problem affected by personal and technical factors and has attracted the attention of many researchers. Therefore, this paper will conduct a systematic literature review to explore the causes of information cocoons, their various effects, and proposed measures, providing a comprehensive framework for scholars and business leaders to understand information cocoons. Specifically, the information cocoon comes from confirmation bias, in which people only pursue information consistent with their cognition, and personalised recommendation systems will positively mediate this causal relationship. Besides, the formation of information cocoons will have three effects, which are consumption cocoons, user fatigue, and group polarisation. To mitigate these negative effects, scholars believe that potential solutions are to improve individuals' information filtering ability and optimise personalised recommendation algorithms. All in all, this paper analyses the whole process of 'causes-consequences-interventions' of information cocoons in social commerce for the first time, providing comprehensive theoretical guidance for the economic development of social platforms.

Keywords: Confirmation Bias, Personalised Recommendation Systems, Information Cocoons, E-commerce, Social Commerce

1. Introduction

The overload of digital information has significantly increased the cost of information filtering. Therefore, the information acquisition mode has gradually switched from actively searching to passively receiving algorithmic recommendations. However, suggestions from the personalised recommendation system are often accurately in line with users' preferences, surrounding people with tailor-made content. As a result, people immerse themselves in information cocoons, which are spaces defined by external isolation and internal unity [1]. In these spaces, people choose topics of interest, merely seek opinions that agree with them, and ignore opposing opinions. This phenomenon of information narrowing and exclusion has increasingly attracted the attention of researchers. Previously, scholars mainly focussed on the information cocoons in traditional social media and indicated that they would exacerbate ideological division and group polarisation [2]. Nowadays, researchers prefer to examine information cocoons in e-commerce and explore their

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impact on consumer satisfaction, brand loyalty, and customer rights [3]. Hence, this paper will combine social media and e-commerce factors to form social commerce and explore the formation of information cocoons, their negative effects, and methods to mitigate these impacts (as shown in Figure 1).

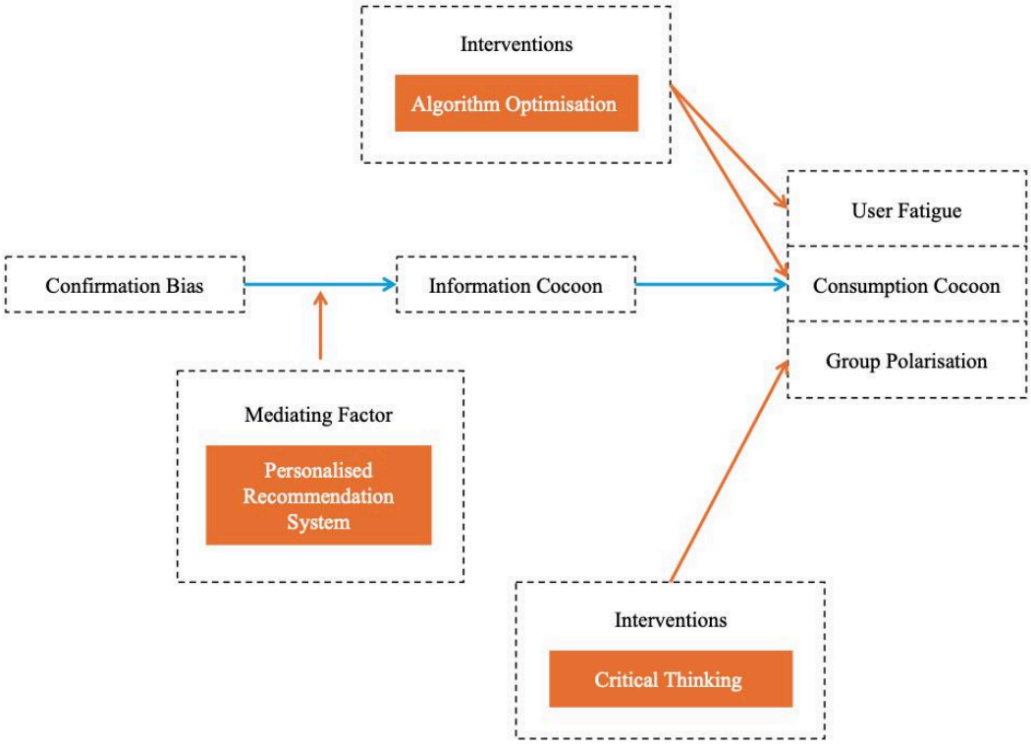

Figure 1. Causes, consequences and interventions of information cocoons

2. Causes of information cocoons

Some researchers have shown that strengthening of confirmation bias will create an information cocoon, and personalised recommendation will positively mediate this relationship [4].

2.1. Personal elements (confirmation bias)

To reduce psychological distress, many people tend to immerse themselves in an environment where lots of others agree with their views. This tendency is known as confirmation bias [5]. Such bias becomes more pronounced in social commerce and could create information cocoons [6]. Specifically, since social commerce platforms can integrate almost all product information, they expand the scope of information that consumers can access, which is much larger than that of offline stores. Such expansion makes consumers panic and more dependent on their own inertial ideas while buying, rather than searching for more information to make a better decision. As a result, confirmation bias is stimulated and strengthened, creating information cocoons. Besides, consumers will receive physical products and evaluate their quality to determine whether these products meet their original preferences. If they are satisfied with the products, their confirmation bias will be strengthened. Over time, the information cocoon will be generated [6]. Therefore, whether before or after purchase, the main reason for the formation of information cocoons is the strong desire of individuals to maintain cognitive consistency.

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2.2. Technological elements (personalized recommendation systems)

The personalised recommendation system effectively filters information by helping consumers discover the content they are interested in, which initially solves problems caused by information overload. However, this kind of highly matched recommendation accelerates the formation of an information cocoon [6]. It is well established that a personalised recommendation system has the extraordinary ability to learn consumer preferences [7], because it could constantly optimise the accuracy of its recommendations in the process of interacting with customers. Specifically, it can preliminarily predict consumers' interests by analysing their historical behaviours and dynamically adjust its recommendations by collecting their dwell time, sharing frequency, likes and blocks on different products. In this case, even if customers' preferences fluctuate, it can provide accurate recommendations. Consequently, customers will always be satisfied and immerse themselves in their own preferences, thus exacerbating confirmation bias. Meanwhile, this perfect match will reduce the external stimulus that challenges consumers' preferences [8], decreasing the possibility of alleviating and correcting the confirmation bias. In general, the personalised recommendation system amplifies confirmation biases, which provide the necessary conditions for the formation of an information cocoon [6].

In social commerce, the mediating effects of the personalised recommendation system discussed above are more notable because capitalists tend to attract consumers and increase their willingness to purchase through the most perfect recommendation algorithms, eventually seizing limited market share and maximising profits [9]. Guided by this tendency, the employees of the R&D (Research & Development) department of platforms are immersing themselves in developing two types of perfect algorithms, which are complementary. Specifically, R&D personnel will design an algorithm that can accurately predict consumers' preferences to ensure that the content they recommend is in line with the interests of customers. Moreover, they apply social network analysis technology to collect the preferences of other people in the consumers' social circles, such as the bloggers they follow and their fans, and integrate these shared interests into the personalised suggestions to customers [10]. For example, slogans like 'Sandy purchased and recommended this product' will be displayed. These slogans will increase consumers' willingness to buy because they are willing to trust their friends' choices and hope to become part of the group quickly in this way [7]. In general, whether it is a fundamental or an advanced algorithm, consumers have to receive information that matches their preferences well, resulting in immersion in confirmation bias and information cocoons.

3. Effects of information cocoons

3.1. User fatigue

The personalised recommendation system can assess consumers' preferences and provide them with similar content to satisfy them. however, if it merely recommends well-matched products, it will force customers into a perfectly customised information cocoon, which in the end will make them feel fatigued. in more detail, when the personalised recommendation system only provides suggestions for customers according to their historical browsing, clicks, shares and purchases, almost all the information that does not conform to their historical preferences will be excluded, leading to homogeneous content exposure [11]. this repetition means that customers are forced to experience the depletion of information [12], slowly diminishing their interest in algorithmic recommendations and platform participation.

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3.2. Consumption cocoons

Unlike the over-matching mentioned above, if the personalised recommendation system retains a little novel content that is out of the consumers' preferences while generating recommendations, customers will not suffer from homogeneous and tedious information and will start to be willing to participate in platform activities. However, this retention will bring a new problem, which is the cocoon of consumption. In more detail, novel content will arouse consumers' curiosity and prompt them to make a purchase. After that, if the experience brought by the purchased product matches their expectations well, consumers tend to repurchase similar products, gradually developing their dependence and trust in the platform. To give an extreme example, when customers are loyal enough, they will tend to obtain the same product of the same brand on the same platform. As a result, a self-closed 'preference-confirmation-preference' mechanism will be formed and gradually reinforced, ultimately creating the consumption cocoon [6]. This paper believes that the above-discussed process will have negative impacts on the welfare of consumers because capitalists could take advantage of their loyalty and consumption cocoons to arbitrarily raise the price of products.

3.3. Group polarisation

Information cocoons are forcing consumers to passively receive homogeneous information. Over time, their values and decision-making rules will become identified and fixed, and their ability to understand external information will be weakened. Hence, it is hard for them to permit diverse opinions to exist in their world, thus contributing to group polarisation. This differentiation is more obvious in social commerce, where the dissemination of homogeneous information and the process of identifying thought patterns are accelerated. For example, TikTok enables consumers to build virtual networks with like-minded persons in several seconds, and to share their views with one-click forwarding. During these rapid interactions, group members could quickly feel a sense of identity, belonging, and satisfaction [13]. Therefore, they will be unwilling to seek information outside their group. What is worse, they may refuse to understand the contradictory views [13]. This means that perception will diverge between groups and the possibility of group polarisation will be increased [13].

4. Proposed interventions

It was mentioned that the formation of information cocoons depends on consumers' tendency to strengthen their existing hobbies and move away from others. Hence, interventions should be relevant to encouraging consumers to actively and frequently seek out diverse information [14]. Besides, the personalised recommendation systems should be improved to avoid overfitting, as consumers also receive information from them passively.

Scholars suggested that consumers should critically evaluate and utilise information that they have obtained [15]. It is well-known that critical thinking could help consumers to realise the negative effects of information cocoons, promote their willingness to actively search for non-matched content, diminish their blind loyalty to their groups, and reduce the possibility of group polarisation. In addition, other researchers indicated that feedback mechanisms should be introduced to mitigate user fatigue and reduce the likelihood of consumption cocoons. For instance, recommendation systems should offer consumers 'dislike' buttons to ensure their right to influence the range of algorithmic recommendations [16], which is beneficial for decreasing the possibility of overfitting.

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5. Conclusion

This paper has systematically reviewed the causes of the formation of the information cocoon, its negative impacts, and the corresponding intervention strategies. Specifically, a variety of studies have shown that the information cocoon is caused by confirmation bias. Moreover, this causal relationship will be positively mediated by personalised recommendation systems. For adverse effects, once the information cocoon is formed, the people in the cocoon will continuously receive homogeneous information, causing user fatigue. Particularly, in social commerce, the information cocoon will stimulate the formation of consumption cocoons and group polarisation. To mitigate these negative effects, researchers indicated that consumers' ability to think critically should be enhanced. Besides, the algorithm should be optimised to balance the accuracy of recommendations and the diversity of information. All in all, this paper believes that understanding the formation and impacts of information cocoons in social commerce has great theoretical significance for building a sustainable digital consumption ecology.

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