Analysis of the Correlation between Algorithmic Recommendation Logic and Audience Acceptance in Personalized Precision Push Notifications

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Abstract: This article focuses on the field of personalized and precise push. It deeply analyzes the correlation between the algorithm recommendation logic and the audience's acceptance. By exploring the constituent elements, operation mechanism of the algorithm recommendation logic, and its impact on the audience's information reception environment, combined with the formation process, influencing factors, and internal psychological mechanisms of audience acceptance, it reveals the complex relationship of interaction between the two. The research finds that the algorithm recommendation logic not only improves the efficiency of information matching but also has negative impacts on audience acceptance due to issues such as information cocoons and algorithm biases; while audience acceptance, in turn, affects the optimization and adjustment of the algorithm recommendation logic. Based on this, strategies are proposed to promote the positive interaction between the two in aspects such as algorithm design, user rights protection, and industry regulation, aiming to provide theoretical support and practical guidance for the healthy development of the personalized and precise push field.

Keywords: Personalized Precise Push; Algorithm Recommendation Logic; Audience Acceptance; Relevance.

1. Introduction

In the current era of the digital wave, information is experiencing explosive growth. According to statistics, the amount of data generated on the Internet is measured in Petabytes and is increasing at an accelerating rate [1]. Such a vast amount of information poses significant challenges for users in obtaining the desired content, and traditional information dissemination methods are unable to meet users' demands for precise and efficient information acquisition. Against this backdrop, personalized and precise push technology has emerged and rapidly gained prominence, becoming a key development direction in the field of information dissemination.

Algorithm recommendation, as the core means of personalized and precise push, plays an increasingly important role in information dissemination through its powerful data processing and analysis capabilities. By deeply collecting, meticulously analyzing, and precisely mining multi-dimensional information such as user behavior data, interests, and social relationships, it can tailor personalized information content for users [2]. This precise matching of user needs in information push greatly enhances the efficiency and targeting of information dissemination, enabling users to quickly find the content they are interested in among the vast amount of information, saving a significant amount of time and energy.

However, with the widespread application of algorithm recommendation technology, a series of problems have gradually emerged, attracting widespread attention and in-depth reflection from all sectors of society. The information bubble effect is one of the more prominent problems. Algorithm recommendation tends to push information that is highly consistent with the user's existing interests, causing users to remain in their familiar information domains, limiting their opportunities to access different viewpoints and information, and thereby affecting the diversification of users' cognitive horizons and thinking patterns [3]. The issue of algorithm bias cannot be ignored either. Since algorithm models are trained based on historical data, if the historical data contains biases or discrimination, the algorithm may amplify and perpetuate these biases in the recommendation results, causing unfair impacts on specific

groups [4]. Moreover, the problem of privacy leakage is becoming increasingly severe. Algorithm recommendation requires the collection of a large amount of user data. If this data is not properly protected, it may be leaked or abused, bringing potential risks and losses to users [5].

The audience, as the terminal for information reception, their acceptance directly determines the effectiveness and value of personalized and precise push. If the audience is not interested in or does not recognize the information pushed by the algorithm, no matter how precise the algorithm is, it cannot achieve the expected goals of information dissemination. Therefore, in-depth research on the correlation between algorithm recommendation logic and audience acceptance is of great theoretical and practical significance for optimizing algorithm recommendation technology, improving user experience, and promoting the healthy development of the information dissemination ecosystem. From a theoretical perspective, this research helps to enrich and improve information dissemination theory, deeply understanding the interaction between algorithm recommendation and audiences; from a practical perspective, it can provide useful references for algorithm developers, guiding them to optimize algorithm design, improve the accuracy and diversity of recommendations, and also help platform operators better understand user needs, enhance user satisfaction and loyalty, and promote the sustainable development of the information dissemination industry.

2. The Connotation and Composition of Algorithmic Recommendation Logic

2.1 Definition and Essence of Algorithmic Recommendation Logic

Algorithmic recommendation logic is an intelligent information push rule and mechanism based on advanced technologies and data analysis in the field of information dissemination. It relies on specific algorithm models to conduct comprehensive and in-depth analysis and processing of user behavior data, interests preferences, social relationships, and other multi-dimensional information [6]. Through the mining and integration of these massive data, algorithms can accurately grasp users' personalized needs and select, sort, and push information content that matches their interests to users.

From an essential perspective, algorithmic recommendation logic is an innovative application of mathematical and computer science methods in the field of information dissemination. It simulates the human process of information screening and decision-making. When humans face a large amount of information, they will screen and judge the information based on their own interests, experiences, and needs, and select the content they are interested in for in-depth reading or attention. Algorithmic recommendation logic, through mathematical models and computer algorithms, quantifies and automates this complex process. It uses advanced technologies such as machine learning and deep learning to learn and analyze user data and continuously optimize the rules for information screening and decision-making, in order to achieve efficient matching and precise dissemination of information [7].

The core of algorithmic recommendation logic lies in the deep mining of user data. Through long-term tracking and analysis of user behavior data on the platform, such as browsing records, search keywords, likes and comments, algorithms can construct detailed and accurate user profiles. User profiles not only include basic information such as age, gender, and region, but also cover deep-level information such as user interests, consumption habits, and social relationships. Based on these rich user profiles, algorithms can deeply understand users' needs and interests, providing users with more personalized and precise information content, thereby improving the effectiveness of information dissemination and user satisfaction [8].

2.2 Components of Algorithmic Recommendation Logic

Algorithmic recommendation logic is mainly composed of four key elements：data collection, model construction, content screening and sorting, and push strategy. Data collection is the foundation of algorithmic recommendation. By collecting various behavioral data of users on the platform, such as browsing records, search keywords, likes and comments, it provides rich data support for the subsequent model construction. Model construction uses machine learning, deep learning, and other technologies to process and analyze the collected

data, build user interest models and content feature models, in order to achieve precise matching between users and content. Content screening and sorting are based on the results of model construction, selecting content related to the user's interests from a large amount of information content, and sorting it according to certain rules to improve the efficiency of users' acquisition of interesting information. Push strategy is to select appropriate times and channels to push the screened and sorted information to users based on their usage habits, time preferences, and other factors, in order to enhance users' willingness to receive and experience.

3. The Operating Mechanism of Algorithmic Recommendation Logic and Its Impact

3.1 The Operating Mechanism of Algorithmic Recommendation Logic

The operating mechanism of algorithmic recommendation logic mainly includes three modes: collaborative filtering, content filtering, and hybrid recommendation. Collaborative filtering recommendation is based on the similarity between users or items to make recommendations. By analyzing the historical behavior data of users, it finds other users with similar interests to the target user and recommends the items they like to the target user; or finds other items similar to the target item and recommends the similar items to users interested in the target item. Content filtering recommendation is based on the matching of item content features and user interest preferences for recommendation. Through feature extraction and modeling of item content information and comparison with the user interest model, items that match the user's interests are recommended to the user. Hybrid recommendation combines collaborative filtering and content filtering methods to comprehensively utilize user behavior data and item content information to improve the accuracy and diversity of recommendations.

3.2 The Impact of Algorithmic Recommendation Logic on the Information Reception Environment of the Audience

Algorithmic recommendation logic plays an important role in changing the information reception environment of the audience. On the one hand, algorithmic recommendation provides users with a more personalized and convenient way to obtain information by precisely matching user interests, saving users' time and energy in filtering information and improving the efficiency of information dissemination. On the other hand, algorithmic recommendation also brings a series of negative impacts. The information bubble effect is one of the most prominent problems of algorithmic recommendation. Due to the tendency of algorithms to push information that is highly consistent with the user's existing interests, users are constantly in their familiar information domain, limiting their opportunities to access different viewpoints and information, thereby affecting the diversification of their cognitive horizons and thinking patterns. In addition, algorithmic recommendation also has the problem of algorithm bias. Since the algorithm model is trained based on historical data, if the historical data has biases or discrimination, the algorithm may amplify and continue these biases in the recommendation results, causing unfair impacts on specific groups.

4. Formation Process and Influencing Factors of Audience Acceptance

4.1 Formation Process of Audience Acceptance

Audience acceptance refers to the degree to which the audience recognizes, accepts and uses the information they receive. Its formation process is a complex psychological and behavioral process, mainly consisting of four stages: information perception, information understanding, information evaluation and information acceptance. In the information perception stage, the audience receives the algorithmically pushed information content through their sensory organs, forming an initial impression of the information. In the information understanding stage, the audience uses their own knowledge, experience and cognitive abilities to interpret and analyze the information, understanding its meaning and intention. In the information evaluation stage, the audience evaluates the information based on their values, needs and expectations, judging its value and practicality. In the information acceptance stage, if the audience believes that the information meets their needs and expectations, they will exhibit acceptance behavior, such as reading, sharing, saving, etc.; otherwise, they may ignore

or reject the information.

4.2 Factors Influencing Audience Acceptance

The factors influencing audience acceptance mainly include three aspects: information content factors, individual factors of the audience and environmental factors. Information content factors are the direct factors affecting audience acceptance, including the authenticity, accuracy, timeliness, interest and practicality of the information. If the information content can meet the audience's needs and interests and has high value and quality, it is more likely to be accepted by the audience. Individual factors of the audience include age, gender, education level, occupation, interests and hobbies, values, etc. Different individuals, due to differences in their own characteristics and needs, will have different levels of acceptance of the same information. Environmental factors include social cultural environment and information dissemination environment. The social cultural environment will affect the audience's values and cognitive patterns, thereby influencing their acceptance attitude towards information; the information dissemination environment will affect the dissemination method and effect of information, such as the convenience of the dissemination channel, the form of information presentation, etc., will all have an impact on the audience's acceptance degree.

5. Analysis of the Correlation between Algorithm Recommendation Logic and Audience Acceptance

5.1 Positive Impact of Algorithm Recommendation Logic on Audience Acceptance

Reasonable algorithm recommendation logic can significantly enhance audience acceptance. By precisely matching user interests, algorithm recommendations can provide users with information content that meets their needs and expectations, improving the practicality and value of the information, thereby increasing users' recognition and acceptance of the information. For example, on e-commerce platforms, algorithms recommend related products based on users' browsing history and purchase records, which helps users quickly find the products they need, improving shopping efficiency and satisfaction, and thereby enhancing users' acceptance and loyalty to the platform. Moreover, algorithm recommendations can provide users with diverse information content through personalized recommendations, meeting users' different interest needs, broadening users' information horizons, and promoting their all-round development, which also helps to enhance users' acceptance of algorithm recommendation services.

5.2 Negative Impact of Algorithm Recommendation Logic on Audience Acceptance

As mentioned earlier, algorithm recommendation logic also has some drawbacks during operation, which can have a negative impact on audience acceptance. The information bubble effect causes users to remain in their familiar information domains for a long time, resulting in a monotonous and homogeneous exposure to information, which can easily lead to aesthetic fatigue and cognitive biases, reducing users' interest and acceptance of the information. Algorithm bias issues may cause some users to be treated unfairly, with recommended content not meeting their actual needs and interests, or even containing discriminatory information, which seriously damages users' rights and feelings, triggering users' dissatisfaction and resistance to algorithm recommendation services. Additionally, algorithm recommendations overly pursue personalization and precision, which may increase the risk of privacy leakage for users, and users' concerns about their privacy security also affect their acceptance of algorithm recommendation services.

5.3 Counteraction of Audience Acceptance on Algorithm Recommendation Logic

Audience acceptance is not a passive result of algorithm recommendation but has a counteractive effect on algorithm recommendation logic. The acceptance behavior and feedback information of the audience are important bases for algorithm recommendation logic optimization and adjustment. When users show a high level of acceptance of the recommended content, such as frequent clicks, prolonged reading, and active sharing, the algorithm will consider this recommended content to be in line with user needs, and thus increase the frequency of similar content recommendations in subsequent recommendations; conversely, when users show a low level of acceptance of the recommended

content, such as quickly swiping away, ignoring, or marking as uninterested, the algorithm will consider this recommended content not to meet user needs, and thus reduce the frequency of similar content recommendations or adjust the recommendation strategy. Moreover, users' feedback opinions and suggestions can also provide directions and ideas for algorithm recommendation logic optimization, helping algorithm developers continuously improve the algorithm model and increase the accuracy and diversity of recommendations, in order to better meet user needs and enhance audience acceptance.

6. Strategies for Promoting a Positive Interaction between Algorithm Recommendation Logic and Audience Acceptance

6.1 Optimize the Design of Algorithm Recommendation Logic

Algorithm developers should focus on optimizing the design of algorithm recommendation logic. While pursuing personalization and precision, they should also consider the diversity and fairness of information. On one hand, by introducing diversified data sources and feature dimensions, they can enrich user profiles and content feature models, improving the algorithm's ability to comprehensively understand and grasp users' interests, avoiding the information bubble effect caused by single data. On the other hand, they should strengthen the monitoring and correction of algorithm biases, establish an evaluation index system for fairness, and conduct regular evaluations and adjustments of algorithm recommendation results to ensure that different user groups can receive fair and non-discriminatory information recommendation services. In addition, they should also pay attention to the research on algorithm interpretability to increase transparency and enable users to understand the principles and basis of algorithm recommendation, enhancing users' trust in algorithm recommendation services.

6.2 Protect Audience Rights and Improve Audience Literacy

Protecting audience rights is an important prerequisite for enhancing audience acceptance. Platforms should strengthen the protection of user data, establish sound data security management systems, and adopt effective technical measures to ensure the security and privacy of user data, preventing data leakage and abuse. At the same time, they should grant users more autonomy and control rights, such as allowing users to set their own preferences for recommendations, choose to receive or reject specific types of information recommendations, enabling users to make personalized adjustments to algorithm recommendation services according to their own needs and intentions. In addition, they should also strengthen the education of audience information literacy, enhance their understanding and comprehension of algorithm recommendation technology, and cultivate their critical thinking and information discrimination abilities, enabling them to correctly handle algorithm recommendation information and rationally accept information content.

6.3 Strengthen Industry Supervision and Promote Sustainable Development

The government and relevant departments should strengthen industry supervision in the field of personalized and precise push, formulate complete laws and industry standards, and regulate the application and development of algorithm recommendation technology. On one hand, they should clearly define the responsibilities and obligations of algorithm recommendation service providers, strengthen the review and management of algorithm recommendation content, prevent the spread of false information, harmful information, etc. through algorithm recommendation, and ensure the safety and orderliness of information dissemination. On the other hand, they should establish an evaluation and supervision mechanism for algorithm recommendation services, conduct regular evaluations and inspections of algorithm recommendation services, urge and supervise platforms and enterprises with problems to make rectifications, and impose severe penalties on violations, promoting the healthy and sustainable development of the personalized and precise push field.

7. Conclusion

There is a close correlation between the algorithmic recommendation logic in personalized and precise push and the audience's acceptance. The algorithmic recommendation

logic affects the audience's information reception environment, exerting both positive and negative influences on the audience's acceptance; while the audience's acceptance, in turn, has an opposite effect on the optimization and adjustment of the algorithmic recommendation logic. To promote the positive interaction between the algorithmic recommendation logic and the audience's acceptance, efforts should be made from multiple aspects such as optimizing the design of the algorithmic recommendation logic, safeguarding the audience's rights and interests, enhancing industry supervision and promoting sustainable development, in order to jointly build a healthy, orderly, fair and personalized information dissemination ecosystem and achieve a win-win development of algorithmic recommendation technology and audience demands. In the future, as artificial intelligence technology continues to develop and improve, the relationship between the algorithmic recommendation logic and the audience's acceptance will also evolve and deepen. Continuous attention and research are needed to adapt to the new changes and challenges in the field of information dissemination.

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