EXPLORING ALGORITHMIC EXPERIENCES IN OTT: WITH A MIXED-METHODS APPROACH

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Abstract

This paper addresses the challenge of 'poverty in the midst of abundance' in OTT services, where a vast array of content makes it difficult for users to find what suits their tastes, often leading to subscription cancellations. U.S. market studies show users spend an average of 10.5 minutes searching for content, while in South Korea, they experience psychological fatigue during this process. This indicates a need for improved recommendation algorithms to enhance user experience and reduce service churn The research focuses on identifying attributes in OTT recommendation algorithms that users prefer, aiming to understand which specific features of recommendations are most valued by users. Findings reveal that effective recommendation systems, tailored to user preferences and feedback, can significantly enhance the user experience. Improved search interfaces and content curation are crucial for increasing user trust and satisfaction. The paper provides an academic foundation for understanding algorithmic interplay in OTT

services and practical guidance for companies to develop more effective recommendation strategies. This research underscores the importance of user-centric approaches in OTT platforms to address the content overload problem and enhance overall service quality.

1. Introduction

'Poverty in the midst of abundance' is a problem that has been cited as a weakness of OTT. Due to the vast amount of content, it has become difficult to find content that suits consumers' individual tastes. For example, there are cases where people get tired of looking for the content they want and cancel their subscriptions. A market study in the United States indicates that streaming users spend an average of 10.5 minutes to find the dramas and movies they want(Nielsen, 2023), and in South Korea, OTT users experience psychological fatigue during the search process to find the content they want on OTT(Kang, J. S., 2023). In other words, the problem of finding the content you want due to the huge amount of content can degrade the user experience of OTT services and cause users to cancel their subscription to the service. Accordingly, an effective recommendation algorithm system to eliminate the difficulty and hassle of users in choosing content becomes an important factor in preventing service churn. In order to increase users' trust and satisfaction with recommendation algorithms, there is a need to improve the search and navigation interface and content curation to improve the quality of service (Hamilton et al., 2014). Previous studies on OTT content recommendation systems have generally studied the technical characteristics of recommendation algorithms, service characteristics, user satisfaction, and continuous use. Regarding algorithmic issues, the issue of potential bias in the fairness and transparency of algorithms (Choi, J. & Lee, H. J., 2012) has been discussed. However, OTT recommendation algorithms are not based on a single attribute or metric. It is difficult to find a study that comprehensively considers the main attributes of recommendation algorithms that users can recognize, such as the way of content that is recommended or the reaction to users' feedback. Therefore, this paper aims to explore the attributes preferred by users in the context of OTT media platforms. This will not only provide an understanding of algorithmic interplay in OTT recommendation systems, but also provide an academic foundation for OTT recommendation algorithms. In addition, by conceptualizing the

user experience of recommendation algorithms in OTT services as algorithmic experiences, and revealing the attributes that influence recommendation algorithm preferences, it will be able to provide practical help for companies to formulate recommendation algorithm strategies.

2. Research Background

2.1. Algorithms' Interaction With Users

An algorithm is a system of automated data processing rules to solve a specific problem, which is a key component of software and a logical language system that interacts with users (Ausiello, G., 2013). In other words, it systematically solves complex problems and enables interaction between software and users. Algorithms that provide user-optimized outcomes can increase trust and loyalty by facilitating user decisions in a situation where there is an abundance of choice. Manovich categorizes interaction structures in new media as 'closed', 'interactive', and 'open', For Netflix, the internal workings of algorithms are 'closed', with their mechanisms not exposed externally(Manovich, 2001). However, the process of algorithms collecting and reconstructing data, then displaying it on the platform, is 'interactive'. Recommended sections like "Trending Now" or "Today's Top 10 in Korea" appear to have an 'open' structure, but since users cannot discern how these recommendations are made, they essentially possess a 'closed' nature (Min, S. Y., 2021). This means that users can experience what is provided by the algorithm, but there is a lack of transparency about how it is created. However, while the transparency of algorithms can be an important component of the user's interaction with algorithms, they are not enough to fully describe the user's experience with the algorithm. By introducing the concept of 'algorithmic experience, AX' into the OTT context (Bucher, 2016), this study presents a framework to explore how users perceive algorithms and how they can be used to design better user experiences.

2.2 A Framework for Algorithmic Experience

The concept of "Algorithmic Experience (AX)" proposed by Bucher (2016) represents a novel approach to exploring how users perceive and experience their interactions with algorithms. Alvarado and Waern expanded this concept, developing a framework through semiotic analysis and participant workshops to analyze the algorithmic experience of Facebook (Alvarado & Waern, 2018). This framework offers a foundational understanding of AX and

serves as a crucial theoretical framework for comprehending how users interact with algorithms on digital platforms. It provides practical guidelines for designing and improving algorithms to enhance user experience. The algorithmic experience in media platforms is categorized into five attributes, according to Alvarado and Waern (2018). These identified AX attributes include.

1) Algorithmic Profiling Transparency

This refers to the user's ability to understand what data the algorithm tracks and analyzes. On Netflix, personalized recommendations are made based on the user's viewing history, preferences, and content-related information. However, specific details about which data the algorithm tracks and analyzes are not explicitly provided to the users (Netflix. 2023).

2) Algorithmic Profiling Management

This involves the ability of users to manage their data and the profile created by the algorithm. Netflix users can create personal profiles, set preferences for content genres and tastes, thus each profile has its own viewing history and recommendation list. Features like content age restriction or hiding content from viewing history are available (Netflix. 2023).

3) Algorithmic Awareness

It means the user's recognition of the existence and impact of the algorithm, understanding how the algorithm works, and how their behavior influences it. On Netflix, this information isn't directly communicated to users. They indirectly perceive the influence of the algorithm through personalized recommendations and sections like 'Netflix Popular Content'.

4) Algorithmic User-Control

This refers to giving users some level of control over the algorithm's outcomes (i.e., how and when the algorithm displays recommendations). Netflix does not offer direct control over the algorithm's outcomes to its users. For example, the order of the recommendation list layout can't be altered, and content rating is limited to binary options (Netflix. 2023).

5) Selective Algorithmic Remembering

This involves users being able to remember preferred algorithm-based recommendations and adjust settings to prevent unwanted content from appearing. On Netflix, recommendations are based on remembered user preferences and interests. Direct deletion or hiding of recommended results is not possible, except for the 'remove' feature in the row layout for currently watched content (Netflix. 2023).

Therefore, this study sets the following research questions for the purpose of exploring the attributes preferred by users among the attributes of recommendation algorithms in the context of OTT media platforms.

RQ1. When using OTT services, what attributes do user prefer in recommendation algorithms?

3. Methods

The mixed research method uses both qualitative and quantitative research methods. It is differentiated by the fact that it allows for a wealth of insight into the phenomenon and the development of outstanding theoretical models, which transcends the limitations of research conducted with a single qualitative or quantitative methodology (Venkatesh, Brown, & Bala, 2013). This methodology combines the advantages of in-depth explanations of qualitative research with concise summaries and generalizations of quantitative research, helping to understand phenomena more comprehensively and multifaceted (Babbie, 2022). Therefore, this study uses a mixed methodology to conduct both qualitative and quantitative analysis of algorithmic experience on OTT platforms.

Study1: Focus Group Interview (FGI)

As the first phase of a mixed-methods research approach, qualitative research through interviews was conducted with OTT users. In December 2023, interviews were held with five subscribers who actively used OTT services in the last three months. The interviews, each lasting about 40 minutes, were conducted in a relaxed setting and were one-on-one. The primary focus was on their Netflix viewing experience, satisfaction with the recommendation algorithm, key aspects of AX, and areas for improvement. Open-ended questions guided the interviews. Data

derived from the interviews were categorized and analyzed for common or related themes through coding. The demographic characteristics of the interview respondents are as follows.

Table 1.1 *Demographic distribution of the interview respondents*

Category		Number of Samples	Percentage (%)
Gender	Male	2	40.0
	Female	3	60.0
Age	20s	2	40.0
	30s	2	20.0
	40s	1	20.0
Occupation	Office worker	1	20.0
	Other	3	60.0
	Unemployed (Housewife)	1	20.0
Total		5	100

Study2: Experimental Survey-Based Conjoint Analysis

Conjoint analysis is predicated on the assumption that consumers make their final choices based on the attributes of a product (Voelckner, 2006). It's an analytical technique used in marketing to predict the product a consumer will choose by estimating the relative importance of different product attributes and the utility of each attribute level (Green & Srinivasan, 1990). A conjoint profile is a combination of extracted attributes and attributes that are constructed based on the level of the attributes.

In Study 2, this paper designed a conjoint analysis incorporating the key attributes identified in Study 1. The researcher created service screen profiles reflecting these attributes and asked respondents to indicate their preferences for these profiles.

4. Results

{Study1}: In our study, we categorized responses to main attributes of 'Algorithm Experience (AX)' in the OTT context. Based on this, we concluded that the five attributes of AX framework are applicable in OTT environments. We excluded account management from Netflix, already actively used, in our conjoint profile design.

First: 'Selective algorithmic remembering' was perceived by all respondents as the most important AX attribute. Respondents said they would like to "actively take advantage of the ability to highlight or hide specific content that influences the recommendation algorithm,"

adding that "this feature is expected to improve the accuracy of recommendations and reduce the time it takes to find content."

Second: 'Algorithmic User-Control' is the degree of user control over the algorithm, which was ranked as the second most important attribute in AX by three respondents. There was an opinion that it seems necessary to develop Netflix's algorithm control function by referring to the functions of other apps, and it would be nice to add a function that receives recommendations for various time periods, such as Spotify, for example." On the other hand, users who feel uncomfortable with the dentures on the current recommended list being at the bottom of the screen needed the ability to adjust the screen layout.

Third: 'Algorithmic Awareness' and 'Algorithmic Transparency' ranked third, respectively. In algorithmic perceptions, respondents believed that Netflix recommends content based largely on genre, and they were less aware of what data Netflix actually collects to make recommendations(such as viewing history, content ratings, actors, and watch time). Regarding algorithmic transparency, he said, "I feel that proper guidance is necessary, but if it is too complicated or provided frequently, it may be unnecessary information," and "what is there is better than nothing."

Fourth: 'Algorithmic Profiling Management' was found to be a relatively low importance attribute. Netflix's history management feature is already available, so it would be nice to have additional advanced features, but even at this level, respondents said they were happy with it.

{Study2}: In the second stage of the study, the main attributes are derived from the first study and then the level of each attribute is determined. Determine the attributes and attribute-specific levels to design a conjoint profile. Participants will fill out a questionnaire to rank their preferences among these OTT AX profiles.

Table 1.2. *Key Attributes Constituting AX in OTT*

Attributes	Definition	Level
Algorithmic transparency	Availability of explanations about what data the recommendation algorithm tracks and analyzes	Provided, Not provided
Algorithmic profiling management	Ability of users to manage their preferences and interests in content through profiles generated by algorithms	Provided, Not provided
Algorithmic awareness	Whether the reason for recommended content is based on popular information or user-specific information	General data (e.g., TOP 10, Most popular), User profile data (e.g., Viewing habits, Genre, Preferences)
Algorithmic user-control	Level of evaluation available for recommended content	Like/dislike, 5 stars rating, 10 points
Selective algorithmic remembering	Ability of the user to selectively and directly provide feedback on content of no interest	Provided, Not provided

1) Conjoint Profile Composition

Based on prior research, this study identified attributes influencing OTT AX as algorithmic transparency, awareness, user control, and selective remembering. The attributes and levels are as described below. Using the SPSS29 program and orthogonal array design, we extracted 8 profiles as shown in (Table 1.3).

Table 1.3. *Conjoint Profile*

Algorithm transparency	Algorithmic profiling	Algorithm awareness	Algorithm Feedback	Algorithm Adjustment
Not provided	Not provided	Provided (general)	Like/dislike	Not provided
Not provided	Not provided	Provided (user profile)	Like/dislike	provided
Not provided	Provided	Provided (general)	5 stars rating	provided
Not provided	Provided	Provided (user profile)	10 points	Not provided
Provided	Not provided	Provided (general)	10 points	provided
Provided	Not provided	Provided (user profile)	5 stars rating	Not provided
Provided	Provided	Provided (general)	Like/dislike	Not provided
Provided	Provided	Provided (user profile)	Like/dislike	provided

5. Implications

This research investigates five key attributes that comprise Algorithmic Experience (AX) to enhance OTT users' interactions with algorithms and explores how these can be effectively applied in OTT environments. Extending previous research on algorithmic experiences from the realm of social media to OTT contexts broadens the scope of this research field.

By identifying the key attributes and levels of algorithmic experience as perceived by users, this study provides valuable insights into understanding algorithmic experiences in OTT services. Future conjoint analysis will allow us to identify user-preferred profiles, laying the groundwork for proposing ways to improve algorithmic experiences in OTT. This analysis will not only increase the efficiency of personalized content recommendations by reflecting user preferences and interests but also enhance user satisfaction and loyalty to the service.

Additionally, this research offers practical guidelines for OTT service providers on user-centric algorithm design. Tailoring algorithms to meet user needs and expectations can

be a crucial factor in improving user experience and differentiating OTT platforms. The findings of this study contribute to the continuous development and user-focused innovation of OTT services, providing foundational data for effective strategy formulation across the OTT industry.

Most consumers will pay attention to the foods that are raw materials from nature without the screening process or chemicals for safety. Many of factors made the consumer interest in healthy the health food market is constantly expanding. The principal objectives of the study were as follows.

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