The Frontiers of Society, Science and Technology
ISSN 2616-7433 Vol. 1, Issue 07: 52-58, DOI: 10.25236/FSST.2019.010706

Combination of Uses and Gratification Theory and Mental Accounting Model on Inter-Media Recommender System

Chu Wentao

Arts and Media College of Anhui University, Hefei Anhui 230001, China

ABSTRACT. *When the new media usually represented by the Internet and mobile terminals met traditional mass communication. The uses and gratification theory which hold the perspective from the audience by analyzing the audience's media contact motivation and what these contacts meet their needs. This article tries to find a Find a mixed solution to the problem by delighting the interaction of gratification and media type and need to combine the mass communication theory, uses and gratification theory, and consumer behavior theory, mental accounting theory together, thus give a clearer view of media with both social character and business character. In addition, discuss a new way to create a more effective recommender system, inter-media recommender system.*

KEYWORDS: *Uses and gratification theory; Mental accounting model; Recommender system; New media; Movie recommendation*

1. Introduction

Uses and Gratification theory as one of the most important theories which emphasize on the audiences' active participation in communication states that audiences have expectations to media and will seek for certain media that meet their gratifications (Elihu Katz et al, 1974) [1]. It can help to target different types of audiences seeking for similar gratifications. With the help of big data, media can easily find audiences with similar needs and provide certain media products meeting their needs. Recommender system is one of the most successful applications.

Recommender system is a widely used system first developed by Tapestry trying to predict the preference of users according to their obtained previous track with the support of big data (David Goldberg et al, 1992) [2]. Its application on new media exaggerates the effectiveness of users' online search by offering most personalized choices. It has been successfully used in recommending movies, music, book and other products. Most of those best-known websites like Amazon for online shopping, Netflix for movie recommendation have applied recommender system to provide a most personalized service to their customers. It is one of the greatest advantages of

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new media to take full use of the audiences' feedback, which has never been accomplishable in traditional media ages.

2. Reasons for Combination of the Mass Communication Theory and the Consumer Behavior Theory

It seems like in media recommender system, the information flows one way instead of reversibly. A certain platform obtains information from other media and makes an accurate recommendation of their own products. Online shopping websites may get information from your social media like Facebook or Twitter in the United States Weibo or Wechat in China and recommend their items to you. Movie recommendation engines may get information about your online book purchasing and recommend you a movie adapted from the book you bought. Nevertheless, we do not see many recommendations of relevant content in other media in their own platform. After you searched for a movie in a movie recommendation engine, you may get recommendations of other movies with same actor instead of a recommendation of an online magazine with the actor's interview. Some new media types, like Flipboard started to use inter-media recommendation recently. However, it is still not very common.

It seems reasonable if we go back to see the uses and gratification theory. According to the theory, media compete with each other and other alternative resources for needs gratification (Elihu Katz et al, 1974) [1]. In another word, the certain need can be met with many different media and other non-media source. As a result, an inter-media recommendation became impossible.

However, we should not forget that when a certain need is being met with lots of media, a certain media can provide not only one gratification at the same time. For example, a person can either watch movies or listen to music to obtain the affective need; watching movies also can meet the affective need and self-identification need at the same time. In this way, a complicated reticulation formed.

To solve the complex interaction, researcher will adapt another behavioral model, mental accounting, into the application of uses and gratification theory on recommender system. According to mental accounting model, people will have their own mental accounts based on different categorization process. If we use this model to categorize all those gratifications provided by different media, they will be put into different mental account instead of being simply accumulated.

This combination can be explained by extension of uses and gratification theory in new media. Internet can offer process gratification, content gratifications and social gratification at the same time. Even similar products share same content gratifications, the process of obtaining them from different media can provides different process gratifications.

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3. New Thought in New Situation

Based on the combination of uses and gratification theory and mental accounting model, certain questions could be hands up: (1) examine the possibility of inter-media recommender system;(2) investigate audiences' preference between two different ways of recommender system, single-media recommender system and inter-media recommender system, and (3) improve the uses and gratification theory by taking complex interaction of media and needs into consideration.

More than that, researchers should try to improve the uses and gratification theory by delighting the interaction of gratification and media type and need to combine the mass communication theory, uses and gratification theory, and consumer behavior theory, mental accounting theory together, thus give a clearer view of media with both social character and business character. Besides that there could be a more effective recommender system, inter-media recommender system.

Audiences are started to be believed to be goal-oriented since a very early time (McQuail, Blumler, and Brown, 1972) [3] However, traditional media makes it hard to get feedback from audiences, so the activeness of audiences were not treated with importance. The uses and gratification theory have a revolutionary meaning in mass communications history because it was the first theory to systematically emphasize on the activeness of audiences and states that audiences are self-aware to be able to recognize their needs and able to choose those media products that can provide the corresponding gratifications (Elihu Katz et al, 1974) [1].

The development of new media pushed the improvement of uses and gratification theory much forward. Researchers started to dig deep into newly formed needs following with the appearance of new media and started to compare the new media with traditional ones in terms of gratifications. For example, Thomas F. et al (2004) [4] states that internet generally provides the audience process gratification, content gratification and social gratification. Process gratification means that people would like to surf on the internet purposely or randomly and get gratifications of its functional process. Content gratification concerns about the massage carried by the media that meet the certain needs of audiences. Social gratification means that audiences get more social connection with the help of internet and feel the gratification. With all different gratifications besides those included above, it is important to have a structure to classify them into different categories. When we apply it to the recommender system, there is a clearly necessity of clarifying those gratifications to make accurate predictions and give out best recommendation.

4. Why Chose Recommender System?

Recommender system is a typical application of uses and gratification theory. It links nonrepresentational gratifications with visible items by adding social tags on items. For example, if we see a tag of comedy on a movie, then we know that we can get entertainment gratification from this movie. Movie recommendation was the

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most commonly used way of recommender system. The famous movie recommendation engine, Netflix, offered the Netflix Prize to the team who made most accurate prediction, and it was a milestone in the improvement of recommender system. In this study, we will also use movie recommender system, the most mature and popular recommender system, as a way to test the efficiency of a new kind of recommendation.

Recommender system has two main ways of filtering to form recommendations: collaborative filtering and content-based filtering (Mark Claypoo et al, 1999) [5]. However, the results of their application situation in different fields show different effects. Collaborative filtering is a way to collect decisions (always ratings) from a group of audiences, those early adopters (Ogul, H., & Ekmekciler, E. 2012) [6], with similar interests and make a model, and then use the model to predict the preferences and decisions of other audiences that are interested in similar items. What makes rating process easily is that audiences can get gratification of having contributed to advancing a community, having one's opinion's voiced and valued etc. (J. Ben Schafer, Dan Frankowski, Jon Herlocker, and Shilad Sen, 2007) [7] Content-based approach is to discrete the item with several characters, and then recommend items with similar characters to the audiences. Take movie recommendation for an example, in collaborative approach recommenders find those audiences searched or commented the same movie and collect information from their decision, like what another movie did they searched or mentioned. After using all that information into a model, the recommenders will recommend the next audience who search the same movie to pay attention to those movies in the model. In content-based approach, recommenders will add tags to all those movies in many ways, like cast, background music, language and/or main topic etc. Then they will collect all those movies with similar tags into a category, and recommend them to the audiences who interested in one of these categories. In mass communications field, both collaborative filtering and content-based filtering are a process of targeting a certain type of audiences originated from media in a micro view seeking for same content gratification according to Thomas F. et al[4].

Precious studies take a lot of efforts to improve the content-related recommendation. Based on the academic literature,many researchers from communication field and information technology field created lots of models to categorize those gratifications, including feature-based recommendation (Karypis, G., & Karypis, G. 2005) [8], MDP-Based Recommending (Shani, G., Heckerman, D., & Brafman, R. I. 2005) [9], goal-based structuring (Van Setten, M., Veenstra, M., Nijholt, A., & Van Dijk, B. 2006) [10], to improve the effectiveness of recommender system. All these recommendations emphasize on categorizing items based on content gratification. There are not many studies about how to categorize items and make recommendation based on media type. Obviously, different media type can provide different process gratifications to audiences. Thus far, we need a new way to divide the gratifications offered by different media types.

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5. The Mental Accounting Model

As Mcquail stated in his Mass Communication theory book, media not only has the function of responding to the social and cultural needs of individuals and societies, but also belonged to a special type of business. So, it is possible for us to apply some consumer behavior theories on mass communications. The mental accounting model, as one of the latest models in consumer behavior field, may help to offer a way to categorize different gratification obtained from different media.

Richard H. Thaler (1983) [11] presented a brand-new model of consumer behavior called mental accounting. He said that people do not always combine the gain and loss to evaluate a purchase. Instead, people have their mental accounting to code, categorize and evaluate economic outcomes. For example, you were planning to see a musical and have purchased a ticket worth $100. Just before you leave to see the musical, you suddenly found out that you lost you watch which worth $100. Do you still want to see the musical? Lots of people answered yes. Another situation is that you were planning to see a musical and have purchased the $100 ticket. Before you leave for the musical, you found out that you lost your ticket. Do you still want to purchase another ticket to see the musical? Most people answered no. If we look back to see the two situations offered above, the loss in both situations were the same while people gave out totally different answer. It means that people have their own mental accounts and put things into different categories. Ran Kivets (1999) [12] developed this theory and claimed that when categorizing things into mental account, people are more likely to choose reasons rather than options.

If we simulate it to develop the uses and gratification theory, different gratification from different media are probably categorized into different mental account, which we call media category account in this study. For example, a certain kind of gratification from a movie and the same kind of gratification from a song may be calculated into different mental account and cannot replace each other. In this way, there is no competition among different media in terms of uses and gratification. One possible explanation is that different media offer different process gratifications even they provide the same content gratifications.

6. Summary and Prospect

To test the practicability of media category account, researchers will divide the movie recommender systems into two kinds, single-media recommendation and inter-media recommendation, and investigate the preference of audiences towards these two recommendation types. The purpose of this article is to combine the uses and gratification theory and mental accounting together to improve the movie recommender system. The operational objective is compared two kind of recommender system, single-media recommendation and inter-media recommendation. If the effectiveness of single-media is higher than the inter-media recommendation, we can know that inter-media recommendation make the noise to the recommended gratification by putting competing media together and that different media have no differences in providing certain gratifications; if the

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inter-media recommendation is superior than the single-media recommendation, we can know that there exists the media type account and different media offers different process gratification even with same content.

Single-media recommendation means that all those recommended items are within same type of media, in this case study, if an audience search for a certain movie (anchor movie), we will recommend other movies with relevant content in a same movie recommendation website. It is a way of recommending that has already been adopted. Inter-media recommendation means that the recommended items are from different media type. Also, if an audience search for a certain movie (anchor movie), we will recommend other items from e-magazines, social media, and online shopping etc. with relevant content. From a psychological point of view, we all know that users don't have a long-term stable mathematical function. Objectively recommend explanations can improve the possibility of accurate push. For instance, the audience may wonder why the system always recommends western movies to the user, actually the user doesn't like western movies at all. The rational use of the explanation of the recommendation system can help audience to get better information. A reasonable recommendation might explain to you that the reason for the recommendation is because you often listen and bought a lot of rural music. There could list a score of possibilities that inter-media recommendation is more superior to single-media recommendation. Then we can assumption that apply mental accounting model on uses and gratification theory.

Acknowledgments

Foundation item: Anhui province humanities and social sciences research major project(SK2018A0688).

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