Literatural Overview on "Detailed" and "Brief" Explanation of Different Recommender Systems

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Abstract This paper provides a literatural overview of two explanation types in recommender systems, which are "Detailed Explanation" and "Brief Explanation". We also give some examples of both types and their analysis based on seven explanatory criterion. The result shows that both types depend highly on their scenario. When considering automobile scenario, we recommend the "Brief Explanation" and when considering desktop scenario, we recommend the "Detailed Explanation".....

1 INTRODUCTION

1.1 A BRIEF INTRODUCTION OF RECOMMENDER SYSTEM

Recommender Systems (RSs) are software tools and techniques providing suggestions for items to be of use to a user[1]. A simplest form of them is a ranking list, where users can find the most popular items and in turn adjust their choices (like the ranking list of App-Store). Although it is not personalized, it is still a kind of recommendation.

More complex forms of RS are like content-based recommendation, user-based recommendation and recommendation based on collaborative filtering, where users

get more specific recommendations based on their previous behaviors, which are, for example, the history views in Youtube or history purchased item in Amazon.

With the development of the Internet, the privacy issue gains more and more importance in the society and people are willing to know which information is "consumed" by the system. They tend to be doubt if the system behaves another way as they expected. In this case, a good explanation of the behaviors of a recommendation system can help inspire user trust and loyalty, increase satisfaction, make it quicker and easier for users to find what they want[2].

1.2 Related Works

A large amount of researches have been done in order to find out what makes a good explanation. David Mcsherry proposed a case-based reasoning (CBR) approach[3] to product recommendation that offers important benefits in terms of the ease with which the recommendation process can be explained and the system's recommendations can be justified.

Another perspective focused on how the soundness and completeness of the explanations impacts the fidelity of end users' mental models[4], where the soundness means the extend to which an explanation describes all of the underlying system and the completeness means how truthful each element in an explanation is with respect to the underlying system.

Besides, TODO: a brief intro to: Toolkit to Support Intelligibility in Context-Aware Applications[5].

TODO: The most popular standard which is used to evaluate the explanation is the explanatory criterion[2].

2 Explanatory Criterion and two Types of Explanation

2.1 Seven Explanatory Criterion

The explanatory criterion[2] (see table 2.1), originally proposed by Nava Tintarev and Judith Masthoff, are mostly used when considering to design the explanation of a recommender system.

Aim	**Definition**
Transparency	Explain how the system works
Scrutability	Allow users to tell the system it is wrong
Trust	Increase users' confidence in the system
Effectiveness	Help users make good decisions
Persuasiveness	Convince users to try
Efficiency	Help users make decisions faster
Satisfaction	Increase the ease of use or enjoyment

Table 2.1: Explanatory criteria and their definitions

Although they have different names in different researches. For example, Mohammed Z.Taie call them explanation attributes[6], which represent the benefits explanations provide to recommender systems and Fatih Gedikli call them quality factors, which he used to evaluate different explanation types in his study[7]. They have the same purpose, that is, to make the system more understandable by users. These criterion are listed here as follows:

1. **Transparency:** TODO:// write the intro
2. **Scrutability:** TODO:// write the intro
3. **Trust:** TODO:// write the intro
4. **Effectiveness:** TODO:// write the intro
5. **Persuasiveness:** TODO:// write the intro
6. **Efficiency:** TODO:// write the intro
7. **Satisfaction:** TODO:// write the intro

2.2 Type 1 -"Detailed Explanation"

TODO: The definition of Detailed Explanation? Most of the recommender systems on desktop scenario adapted the "Detailed Explanation". They covered almost all of the seven explanatory criterion that mentioned above.....TODO: complete the intro part

2.3 Examples for "Detailed Explanation"

An example of explanation in amazon.com. TODO: (Write Analysis based on seven explanatory criterion)

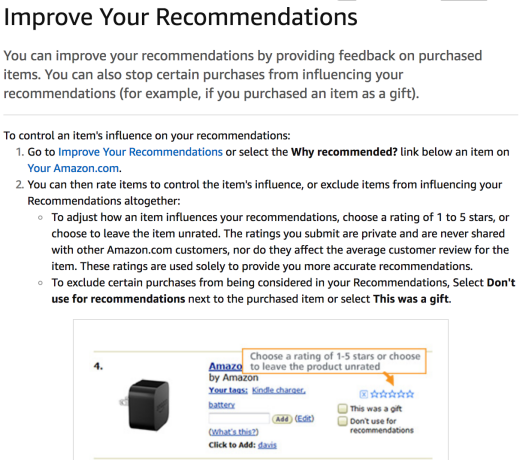

Figure 2.1: Amazon

An example of explanation of Google Ads. TODO: (Write Analysis based on seven explanatory criterion)

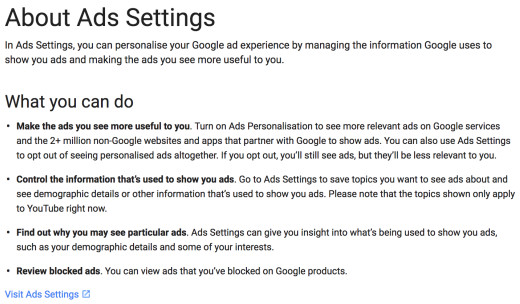

Figure 2.2: Google

2.4 Type 2 -"Brief Explanation"

However, in some scenario, a brief explanation is more suitable, for example, driving in a car (why: users have limited attention resource) We can not take all seven explanatory criterion into consideration. How to extract a kind of standards.

2.5 Examples for "Brief Explanation"

Example1: Explanations in Proactive Recommender Systems in Automotive Scenarios [8] **Extract two criterion out of seven explanatory criterion: Persuasiveness and Efficiency.**

Example2: Why did my car just do that? Explaining semi-autonomous driving actions to improve driver understanding, trust, and performance[9] **Extract two types (what and how)based on question types from Intelligent Toolkit** [5, 10]

2.6 Comparison between "Detailed Explanation" and "Brief Explanation"

3 Conclusion

4 Future Work

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