

A Literatural Overview on Explanation Types in Personalised 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”.....

Index Terms—Explanation types, Recommender system, Personalisation

1 Introduction

TODO:// What is personalised system ?? Recommender Systems (RSs) are software tools and techniques providing suggestions for items to be of use to a user[10]. 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 AppStore). Although it is not personalized, it is still a kind of recommendation.

More complex forms of RS are like **TODO:// explain what it is** 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[11].

2 Overview

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[9] 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[5], 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[7].

TODO: The most popular standard which is used to evaluate the explanation is the explanatory criterion[11].

3 Detailed Explanation

3.1 Seven Explanatory Criterion

The explanatory criterion[11] (see table 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 1. Explanatory criteria and their definitions

Although they have different names in different researches. For example, Mohammed Z.Taie call them explanation attributes[1], 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[3]. 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

3.2 Examples of Detailed Explanation

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

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Improve Your Recommendations

You can improve your recommendations by providing feedback on purchased items. You can also stop certain purchases from influencing your recommendations (for example, if you purchased an item as a gift).

To control an item's influence on your recommendations:

1. Go to [Improve Your Recommendations](#) or select the **Why recommended?** link below an item on [Your Amazon.com](#).
2. You can then rate items to control the item's influence, or exclude items from influencing your Recommendations altogether:
 - To adjust how an item influences your recommendations, choose a rating of 1 to 5 stars, or choose to leave the item unrated. The ratings you submit are private and are never shared with other Amazon.com customers, nor do they affect the average customer review for the item. These ratings are used solely to provide you more accurate recommendations.
 - To exclude certain purchases from being considered in your Recommendations, Select **Don't use for recommendations** next to the purchased item or select **This was a gift**.

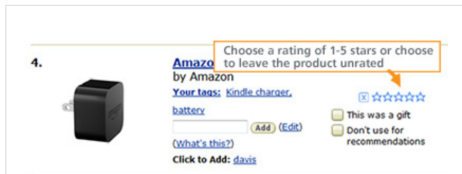


Figure 1. Amazon

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

About Ads Settings

In Ads Settings, you can personalise your Google ad experience by managing the information Google uses to show you ads and making the ads you see more useful to you.

What you can do

- **Make the ads you see more useful to you.** Turn on Ads Personalisation to see more relevant ads on Google services and the 2+ million non-Google websites and apps that partner with Google to show ads. You can also use Ads Settings to opt out of seeing personalised ads altogether. If you opt out, you'll still see ads, but they'll be less relevant to you.
- **Control the information that's used to show you ads.** Go to Ads Settings to save topics you want to see ads about and see demographic details or other information that's used to show you ads. Please note that the topics shown only apply to YouTube right now.
- **Find out why you may see particular ads.** Ads Settings can give you insight into what's being used to show you ads, such as your demographic details and some of your interests.
- **Review blocked ads.** You can view ads that you've blocked on Google products.

[Visit Ads Settings](#)

Figure 2. Google

4 Short 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.

4.1 Possible Criterion for Short Explanation

4.2 Examples of Short Explanation

Example1: Explanations in Proactive Recommender Systems in Automotive Scenarios [2] **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[4] **Extract two types (what and how)based on question types from Intelligent Toolkit [8, 6]**

5 Discussion and Limitations

6 Conclusion

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