Users' Choices About Hotel Booking: Cues for Personalizing the Presentation of Recommendations

Catalin-Mihai Barbu
University of Duisburg-Essen
Duisburg, Germany
catalin.barbu@uni-due.de

Jürgen Ziegler
University of Duisburg-Essen
Duisburg, Germany
juergen.ziegler@uni-due.de

ABSTRACT
Personalization in recommender systems has typically been applied to the underlying algorithms. In contrast, the presentation of individual recommendations—specifically, the various ways in which it can be adapted to suit the user's needs in a more effective manner—has received relatively little attention by comparison. We present the results of an exploratory survey about users' choices regarding hotel recommendations and draw preliminary conclusions about whether these choices can influence the presentation of recommendations.

Author Keywords
Recommender systems; personalization; user study; tourism

ACM Classification Keywords
H.5.2 [**Information Interfaces and Presentation**]: User Interfaces—*evaluation/methodology, graphical user interfaces (GUI), user-centered.*

INTRODUCTION & MOTIVATION
Personalization is an important and well-studied topic in recommender systems (RS). Previous research has noted the positive effect of personalization on enhancing user experience [5]. A relatively unexplored area concerns the personalization of the presentation of recommendations. Elicited user preferences can be used not only to offer personalized predictions, but also to customize the way in which these predictions are presented to the user. Adapting the presentation to fit individual needs has the potential to uncover novel interaction possibilities. We present the results of an exploratory study that investigated users' choices about the presentation of hotel recommendations and our preliminary conclusions on whether these choices could influence the presentation of recommendations.

RELATED WORK
Some of the main research foci of personalization include deciding, for a given recommendation, what information to present, when to present it [1], how much of it to present [2], and in what way [6]. Many existing approaches to personalizing the presentation of recommendations rely on explanations (see, e.g., [7] for an in-depth analysis of the effects). So-called "common sense" approaches, which use rules to determine what items to recommend and how to personalize the presentation have also been developed [3].

EXPLORATORY STUDY
We conducted an exploratory online study to investigate participants' choices about hotel booking. In selecting the domain, we considered three aspects: 1) The choice should carry a substantial amount of risk for the user; 2) the items should have a reasonable set of attributes that need to be considered; and 3) there should be a large body of user-generated content available, in the form of reviews, photos, tags, and ratings, that can be leveraged for the presentation. Because of the first criterion, we decided against using the more common domain of movie recommendations.

Study Design
We theorize that the way in which people make decisions about hotel booking, their trust in social media, and their travel habits influence the information they want to see in a recommendation (i.e. the type of personalization they expect). Our aim for this study was to investigate whether the travel scenario influences users' decision-making processes in ways that can be used to personalize the presentation of hotel recommendations.

The survey was organized in six parts. The first four sections elicited answers regarding our participants' demographics, trust in social media, experience with hotel booking portals, and travel behavior. A filter question was used to assign each participant to one of five travel scenarios: city break / short vacation (1-2 nights), short business trip (1-2 nights), long vacation (3+ nights), long business trip (3+ nights), or family vacation (with children).

In each scenario, users were presented with an identical mockup of a hotel recommendation. First, participants were asked to rank each section of the mockup—overall rating, price, general description of the hotel, photos, a map showing the hotel's location within the city, nearby transportation options, hotel and room amenities, and reviews from users—depending on how important they considered the information in that section to be. Second, they had to select up to 7 topics about which they would like to receive more information when looking at recommendations (e.g., proximity to public transport, room sizes and layouts, or fitness center equipment).

Finally, participants were asked 12 questions designed to determine their typical decision-making behavior during hotel booking. This section was modelled based on the Rational-Experiential Inventory [4], which is designed to

measure participants' need for cognition and faith in intuition, respectively. The questions addressed six underlying factors: a) perceived effort required to complete a hotel booking task; b) economic considerations; c) clearness of mental goal; d) self-efficacy (i.e. trust in one's own choices); e) influenceability; and f) engagement. Two questions (high and low loading) were asked per factor.

Study Results

The survey was published online in January 2017 and ran for one month. A total of 159 participants (82 female; median age in the interval 25-34 years) completed the survey fully. Of the respondents, 123 (77.36%) were employed and 24 (15.09%) were students. Furthermore, 139 (87,42%) had completed at least a Bachelor education. As monetary incentive, all complete responses entered a raffle for one of four Amazon gift vouchers, each worth 25 EUR.

Most participants (51%) rated their trust in online reviews as high or very high on a 5-point Likert scale (M=3.53, SD=0.71). These findings were similar across all scenarios. After data analysis (ANOVAs with Fisher's LSD), we noticed a significant difference ($p < 0.05$) when comparing the business scenarios: Over 65% of participants whose typical travel scenario was "long business trip" reported a high or very high trust in online reviews, compared to only 48% in the "short business trip". The availability of reviews was rated as very or extremely useful by 78% of participants (M=3.96, SD=0.75). Similarly, photos were considered very or extremely useful by 82% of respondents (M=4.17, SD=0.82). In both cases, we observed no significant differences between travel scenarios.

Certain patterns emerged with respect to users' typical decision-making behavior during hotel booking. First, booking a hotel for vacation is considered more challenging than for business travel—especially for longer stays ($p < 0.05$). Second, people who typically go on longer vacations need more time to decide which recommendation to follow when prices are higher than they are used to. The difference was significant ($p < 0.05$) when compared to the answers from the "long business trip" scenario. Third, participants tend to revisit recommendations to ensure they do not miss important information. A significant difference ($p < 0.01$) was observed when comparing the scenarios "short vacation" and "short business". These results suggest that the travel scenario can be a factor for personalizing the presentation of recommendations. However, its influence may be lower than predicted (Figure 1).

Contrary to our expectations, we observed almost no significant differences in terms of the importance of the mockup sections for the different scenarios. The sole exception ($p < 0.01$) was "general hotel description", which proved particularly unimportant for respondents in the "long business" scenario. Similarly, the list of topics about which participants stated they would like to see more information when browsing recommendations did not exhibit significant differences across scenarios.
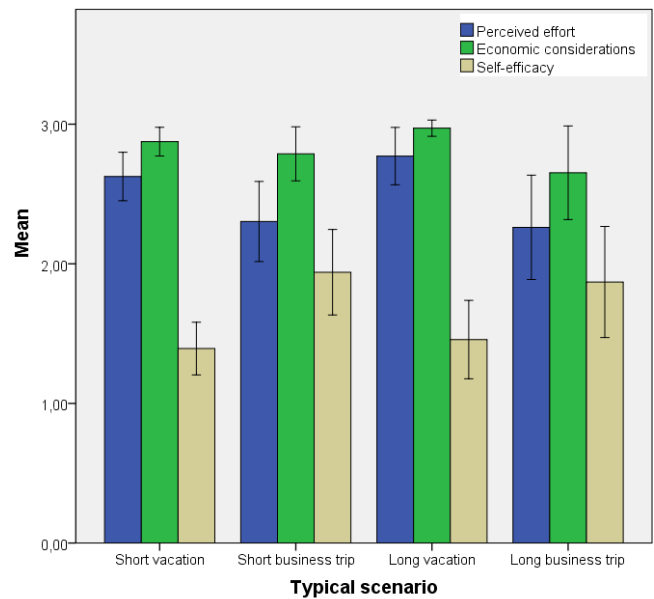

Figure 1: Results of users' decision-making behavior during hotel booking. Error bars denote the 95% confidence interval.

Initial findings suggest that the motivation behind searching for a recommendation influences users' decision processes. As ongoing work, we are investigating potential links between individual factors and presentation preferences.

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