Designing TV Viewer Stereotypes for an Electronic Program Guide.

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Abstract. This paper describes how a user modeling knowledge base for personalized TV servers can be generated starting from an analysis of lifestyles surveys. The aim of the research is the construction of well-designed stereotypes for generating adaptive electronic program guides (EPGs) which filter the information about TV events depending on the user's interests.

INTRODUCTION

With satellite and cable TV, the convergence of TV and Internet and the advent of digital networks, the offer of TV channels will increase in the near future. Consequently, it will be very difficult for the users to find quickly their favorite programs. In such a scenario, personalized filtering techniques will become fundamental to reduce the huge amount of broadcasted programs. Therefore, it will be necessary the presence of an intermediary between the TV broadcasters and the viewers, such as a personalized electronic programs guide (EPG), in order to recommend in a timely fashion the programs which best match the individual viewing preferences. In the area of personalized services for TV programs, several tools exploit collaborative and content-based filtering techniques for user profiling and recommending the appropriate programs. For example, PTV [1], a Web-based personalized television listings service, learns the individual user' s viewing preferences on the basis of explicit program ratings and then generates personalized TV guides by applying hybrid collaborative and case-based filtering techniques. As far as the application of stereotypes-based user modeling techniques to TV services is concerned, not many examples are available. In the FACTS project, Bellifemine et al [2] classify viewers into three featured groups on the basis of their watching behavior: common user group, special user group, and collective user group.

This paper describes how a knowledge base for user modeling techniques adopted in the generation of personalized TV program guides can be designed starting from an analysis of lifestyles surveys. This work is part of a more extensive research for the development of a system which generates adaptive EPGs [3]. The system includes a user modeling component which exploits stereotypical information. We decided to use a stereotype-based user-modeling system in order to personalize and adapt the interaction with the user since the first time he logs into the system. The stereotypes enable the system to make default inferences starting from a small amount of

information about the user [4]. This generic user model can be revised after monitoring the user's behavior.

STEREOTYPICAL KNOWLEDGE

The exploitation of sociological stereotypes seems to be usual in the mass-media world. Thus, we decided to generate our user modeling knowledge base starting from an analysis of existing surveys about TV viewers. Particularly, we examined the lifestyles surveys which cluster the population into groups according to consumers' preferences, socio-cultural trends, homogeneous behaviors. Especially, we concentrated on a lifestyles' study, Sinottica, conducted by Eurisko data analyzers [5]. Given the completeness of the considered viewpoints and the reliability of collected data, we decided to build the stereotypes knowledge base starting from the Eurisko lifestyles. However, the information regarding the lifestyles is not defined in a formalized way. Thus, we exploited a formalism to structure the information characterizing each user class in order to represent in a formalized way the lifestyles descriptions [6]. Moreover, we structured the stereotypes in two main parts, assuming a plausible correlation among homogeneous user groups and their preferences: *a profile*, containing the classification data of individuals belonging to the represented stereotype; *a prediction part*, containing the preferences typical of such individuals. A similar approach has been adopted in SETA, a prototype toolkit for the construction of adaptive Web stores [7]. While the classification data are used to evaluate how close the individual viewer using the EPG matches a stereotypical description, the preferences are used to enable the user modeling system to make initial predictions by exploiting stereotypical information. The Eurisko lifestyles description has been used for the profile of the stereotypes, which has been further split into two main parts: *personal data* (age, gender, education level, type of job, geographic zone); *interests*.

Regarding the prediction part of stereotypes, we initially analyzed a survey on the exposure to the TV, made by Eurisko in collaboration with Auditel, the "super partes" company which daily picks up information about TV audience [8]. We analyzed these information items considering the average audience reception rating (number of average viewers in every minute of a program) and the share (percentage of viewers of a program compared to the overall audience in the same time slot)[9]. To obtain more detailed information, we decided to merge the Eurisko/Auditel audience data and the information about interests. We assumed an existing correlation between the user's interests and the programs concerning his interests. Moreover, we refined such collected data by comparing it with the audience data of Eurisko Big Map [9], a sociographic analysis of Italian society. Finally, we included in the prediction part two temporal dimensions: the watching frequency and the viewing time.

CONCLUSION

The stereotype knowledge base which we described bas been used within the user modeling component of a system for the generation of personalized EPGs [3]. After having gathered real people descriptions, we tested the effectiveness of the system as

regards the classification of people in stereotypical descriptions and the predictions. The initial results showed the fact that stereotypical knowledge is meaningful for users clearly fitting a lifestyle, but does not make good predictions in the cases where users match different lifestyles in different aspects of their behavior. In particular, the system fails when the user's interests are different from those evaluated according his socio-demographic data. However this situation is not unusual, so we have to solve these contrasts to improve the system's recommendations. Thus, we designed the User Modeling Component of the system as structured into different user modeling modules, which exploit alternative sources of information about users. In addition to the Stereotypical Module, an Explicit Preferences Module manages the user's declared preferences and the User Modeling Component is in charge of solving the possible conflicts in the predictions of the two modules.

We believe that the exploitation of stereotypes during the initial interaction with the user gives good results. Moreover, the existence of stereotypical behaviors in watching TV is also supported by empirical studies. At the moment, we are testing new solutions starting from information about different types of people, to simulate the real behavior of the system. During with this second test phase, we will also concentrate on: *refining* the prediction part of the stereotypes by analysing new audience data; *reclassifying* user in more suitable stereotypes, after monitoring the real user's choices; *exploiting* personalization strategies to adapt the content and layout of the TV guide to the user model.

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