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CUSTOMIZING EVENTS WITH EVENTHELPR

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Abstract: *Event management solutions help users to create, manage, and share event-related information. There exist various types of events such as conferences, workshops, project meetings, personal events, and company-specific events such as christmas parties, excursions, and strategy meetings. Supporting these different types of events requires the provision of variability management and personalization functionalities. In this paper, we show how variability management and personalization is taken into account in the EVENTHELPR software. In addition to an overview of included technologies, we discuss application scenarios and analyse related improvements.*

Keywords: ***Mass Customization, Variability Management, Event Management***

1. INTRODUCTION

As a production paradigm, *mass customization* [6] supports the development/production of highly variant products and services under nearly mass production pricing conditions. Applying the concept of mass customization in the context of software services requires the inclusion of variability modeling concepts that help to define the intended software variability at design time and runtime. Software variability modeling [1] takes place at three different levels. *First*, the *architectural variability* of software has to be specified at *design time*. In this context, software engineers specify which features (requirements) should be implemented including related dependencies, for example, *the implementation of a non-anonymous version of the EVENTHELPR[1] software requires the implementation of a login functionality*. *Second*, variability plays a role during *software runtime* where variability models are used to specify which software feature combinations should be provided in which context. For example, feature models [1] help to specify which combinations of features can be applied by different types of users. In the case of an anonymous user (i.e., the user is not registered), specific features must not be offered – EVENTHELPR examples thereof are *archiving* and *posting* functionalities. *Third*, there are further constraints between offered features that have to be taken into account. For example, if EVENTHELPR is used to support order processes (e.g., a sports society wants to know which members are interested in a bonus card provided by a sports company), no separate event page should be shown to the user.

In addition to taking into account variability aspects, EVENTHELPR also supports *content personalization*. An example thereof is *social recommendation* [7], i.e., the recommendation of event participants to other participants. Such functionalities are especially important in the context of larger events where individual participants do not know all other participants and the probability is high that other potential cooperation partners are also visiting the event. A variant thereof are fairs where, for example, potential employees and companies can be recommended to each other. Such a social recommendation functionality is included in EVENTHELPR. Another example of recommendation functionalities included in EVENTHELPR is the *prioritization of alternatives*. For example, the participants of an event are allowed to rank potential topics to be discussed within the scope of the event. In such a scenario, EVENTHELPR provides functionalities that help to rank alternatives on the basis of a pro/con analysis and a related utility analysis [8]. An example screenshot of the EVENTHELPR user interface is provided in Figure 1. This is a typical screen users see when entering an EVENTHELPR event instance.

Our major contributions in this paper are the following. First, we discuss variability modeling aspects in the context of event management. We introduce a new field of application for recommendation technologies which is the person-2-person recommendation in »ad-hoc« events. Finally, we report experiences from ongoing projects and point out issues for future work. The remainder of this paper is organized as follows. In Section 2, we introduce EVENTHELPR and show how the system can be used in different application scenarios. In this context, we also show in which way the mentioned recommendation technologies are applied (Section 3). In Section 4, we report our experiences from ongoing projects. With Section 5, we conclude the paper and discuss open issues for future research.

[1] www.eventhelpr.com

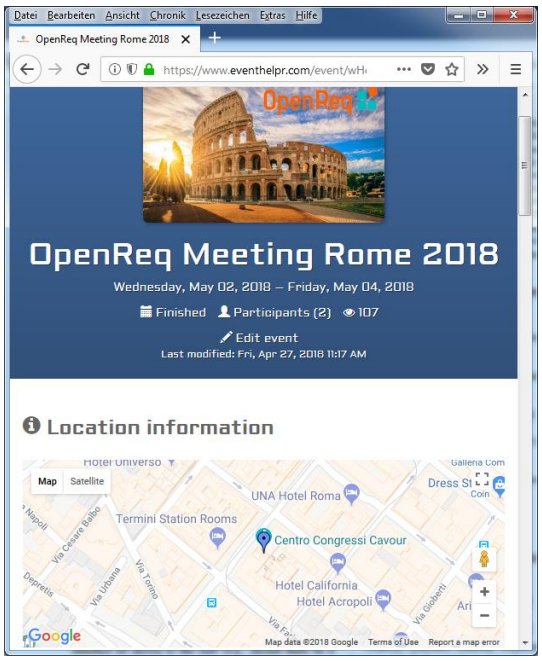

Fig. 1. *EventHelpr user interface (start page)*

2. EVENTHELPR USER INTERFACE & APPLICATION SCENARIOS

The idea of *EVENTHELPR* is to support »ad-hoc« event management scenarios where event information can be shared among participants just in time. Typical scenarios of the application of *EVENTHELPR* are the organization of workshops, project meetings, personal events, and company-specific events such as christmas parties, excursions, and strategy meetings. In the context of these events, information has to be shared among the participants, the organizer of the event has to know who will participate under which conditions, and event participants have to be enabled to communicate to each other. Furthermore, event participants might be interested in recommendations in terms of other participants they should talk to (in many cases, persons they did not meet in person before the event).

In such contexts, the basic idea of *EVENTHELPR* is to support administrators (creators, organizers) of events to easily create events and keep related information units up to date (e.g., location, interesting locations, event agenda). Other users should be enabled to easily register for events, have access to event-related information, and communicate with other event participants. In order to explain the major functionalities of *EVENTHELPR* in more detail, we discuss these on the basis of a *project meeting* sceario. Assume, a European Union project meeting takes place in Rome. The project has 9 partners where from each partner 1-2 persons participate. The partners should be allowed to officically announce their participation. Project partner representatives should be enabled to take a look at the agenda and further information. Furthermore, they should have access to information related to interesting locations in the surrounding, restaurants, and hotels. Finally, they should be enabled to commicate with other event participants, for example, it should be possible to arrange a dinner that takes place before the official project meeting and to clarify final open questions to be answered before the meeting starts next day.

An example of a *EVENTHELPR* event instance is depicted in Figure 1. Before sharing such an event with participants, an administrator (creator, organizer of an event) has to define the initially relevant information (e.g., location information, date of the event, and agenda). Further parameters regarding the event also have to be specified by the administrator (see Figure 2). Examples of such parameters are the following: *in which way should the participation interface be shown to the user* (e.g., should there be a separate explanation text?, *are participants allowed to adapt the agenda on their own* (e.g., in the context of project meetings)?, *are users allowed to invite friends*?, *should event participants be informed about event updates*?, and *should users be enabled to discuss and evaluate agenda items*?

Figure 2 shows an *EVENTHELPR* user interface that supports the configuration (parametrization) of specific aspects of an event instance, for example, the availability of an interactive agenda and the availability of a user interface that supports the specification and discussion of decision alternatives on the basis of a pro/con analysis.

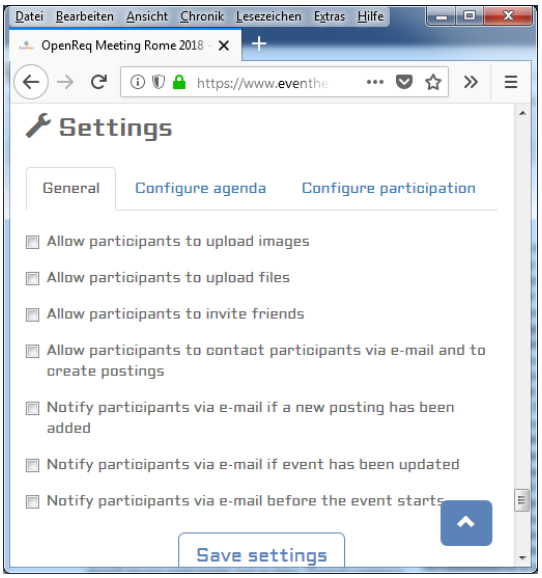

Fig. 2: *EventHelpr user interface for configuring event-specific aspects*

Basic *EVENTHELPR* technologies used for the above mentioned functionalities are the following. First, *variability modeling* [1] is used for specifying compatibilities of different software features. Second, *utility-based recommendation* [8] is used for prioritizing alternatives. In *EVENTHELPR*, utility-based recommendation is implemented on the basis of a pro/con analysis where arguments for and against specific alternatives are evaluated by event participants. Third, *content-based recommendation* [5] can be used to match user profiles on the basis of analyzing the pairwise profile similarity (also denoted as *social recommendation* [7]). In the following, we will discuss the mentioned technologies in more detail.

3. EVENTHELPR TECHNOLOGIES

Variability Management. Since there are a couple of dependencies between different functionalities offered to *EventHelpr* users, the system is implemented on the basis of an underlying variability model [1,4]. Examples of variability rules included in *EventHelpr* are the following: (1) utility analysis of agenda items (i.e., which agenda items should be discussed within the scope of a meeting) is only supported if the administrator defined the agenda to be of type »interactive«, (2) a discussion forum related to agenda items can be provided if only logged-in users are allowed to access the event, and (3) postings are only allowed if the corresponding communication features are activated. These are examples of constraints specified in the *EventHelpr* feature model – for related details we refer to [3].

Utility-based recommendation. *EventHelpr* includes functionalities that support group decision making scenarios in the context of events. For example, within the scope of a strategy meeting of a startup, participants have to discuss strategic directions and features of the software that is currently under development. A related discussion can be supported by a pro/con analysis where positive and negative arguments with regard to specific features/ functionalities can be provided and shared among the participants of the meeting. Figure 3 depicts an *EventHelpr* user interface where the balance between pro-arguments (green), counter-arguments (red), and »neutral« arguments (grey) are summarized.

In this context, *EventHelpr* provides a ranking functionality for proposed alternatives that is based on the concepts of multi-attribute utility theory [8]. The calculation of the utility of an alternative is based on Formulae (1) and (2). This approach can be considered as a specific type of group recommendation [2] since the preferences (arguments) of individual users are aggregated into a »global« ranking that is recommended to a group of users (i.e., not a single person). Since positive (pos) and negative (neg) arguments (args) can be *supported* by event participants (users), the degree of support is taken into account by the utility function. In this context, S_x denotes the number of supports for the current argument whereas S_{total} denotes the total number of supports of all arguments.

$$utility\ (a) = \sum_{pos\ \in\ args} support\,(\text{pos}) - \sum_{neg\ \in\ args} support\,(\text{neg}) \quad \textbf{(1)}$$

$$support\ (x) = 1 + \frac{Sx}{1+Stotal} \quad \textbf{(2)}$$

Content-based recommendation. This approach is based on the idea of recommending items to users that are similar to those that a user already liked in the past. For example, if a user likes specific news items (e.g., politics news), the user will like news related to the same topic also in the near future. In *EventHelpr*, content-based recommendation approaches are integrated to support *person-2-person social recommendation scenarios* [7]. In this context, *EventHelpr* supports the identification of persons that might be of interest within the scope of an event. For example, if two persons specified their interest in configuration algorithms and optimization approaches and are not known to each other from previous events, the system will recommend a potential personal meeting on the basis of common interests. For an overview of approaches to content-based recommendation we refer to [5].

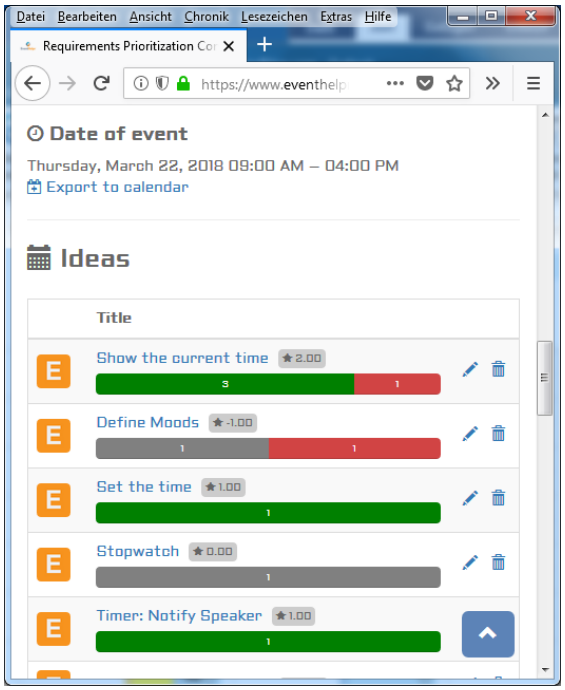

Fig. 3. *EventHelpr user interface to summarize the current state of a decision process supported on the basis of a pro/con analysis*

4. EXPERIENCES FROM PROJECTS

EventHelpr is already applied in different application scenarios. First, the system is applied in research contexts to organize project meetings and events (e.g., conferences and workshops). Furthermore, it is applied by educational institutions in Austria to organize courses and also group meetings. In the latter case, the *EventHelpr* »interactive agenda« feature is used to update the current status of tasks and adapt the description of tasks. Outside the research and university context, *EventHelpr* is used by various societies and sports clubs to organize internal events and meetings and support the communication between society members and society boards. The major improvements coming along with the application of *EventHelpr* technologies are (1) *reduced time efforts* related to the creation and management of events (e.g., in terms of less communication overheads between board and other society members) and (2) less administrative overheads for event participants (e.g., in terms of searching for and managing event-relevant information). Compared to standard content management software, the creation of events and the management and sharing of event-related information becomes an easy task and thus also applicable to persons without experiences in using content management systems. This also allows the ad-

hoc creation of events, i.e, the on-demand creation of events and related information without latency times due to the needed communication with technical experts in charge of setting up an instance of a content management system and sometimes also entering event-specific information. Furthermore, EVENTHELPR provides a systematic view on different event information categories which is not possible when organizing events via email or communication channels such as FACEBOOK or WHATSAPP. The system also goes beyond event services and provides support for intelligent group decision making and social recommendation scenarios where event participants can get in contact with persons having similar interests.

5. CONCLUSION

In this paper we provided a basic introduction to concepts that help to tackle challenges triggered by software variability in the context of event management (e.g., meetings, workshops, conferences, travels, etc.). We discussed these aspects on the basis of an existing system (EVENTHELPR) that supports the creation and management of events. In this context, we provided examples of included technologies (variability management and recommender systems) and discussed experiences from real-world settings where the EVENTHELPR system has already been applied. An important issue for future work is the development of further recommendation approaches in the context of person-2-person recommendation.

6. REFERENCES

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