eXcitingTrails/Events: Events for Touristic Scenarios

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ABSTRACT
The Internet's availability and the growth of Information and Communication Technologies are increasingly being used in benefit of tourism and culture. This project's main goal is to explore innovative solutions to make tourism more appealing. In the scope of the eXcitingTrails initiative, this proposal consists on the creation and promotion of different events for different environments through a web application that manages a small community of users. To enrich this system, a mobile guide, that takes advantage of positioning and wireless communication, is developed to support the realization of these events. The usage scenarios involve leisure activities, like guided or autonomous walks, or even ludic and competitive games, such as peddypapers where visitors can better discover or learn cultural and historical information about a specific area of interest while playing a game and socializing with other visitors.

Keywords
Tourism, Culture, Mobile Computing, Social Computing, Outdoor Activities, Events, Games, Peddypapers.

1. INTRODUCTION
In recent years there has been a growing interest towards the development of mobile guides [1], i.e., mobile systems exploiting portable, lightweight devices to guide the user in different environments and provide them with useful information and services. Additionally as the technologies have improved, allowing higher processing, there was the possibility to feature GPS and Wi-Fi on those devices. Mobile computing has been successfully used as a tool for navigation and geographic information retrieval. The availability of the Internet and the design and implementation of Information and Communication Technologies (ICT) have inspired the development of strategies to support tourism and culture. Those technologies help supply information to favor the communication and the collaboration.

We surveyed and analyzed related work that is relevant to our research, namely [1,9]: REXplore [3], Cyberguide [4], Marked-Up Maps [5], The Roaring Navigator [6], History Unwired [7], and the Geocaching community (www.geocaching.com).

Our intention is to define a system that provided historic and cultural information, in an innovative and more appealing approach for users that are not only wishing to learn more about the places, but also intend to share their knowledge and experiences with others. We propose and discuss the development of the *eXcitingTrails/Events*[1] system that enables the creation and execution of different types of events for touristic and cultural purposes. The system is composed by a web application supporting the creation and publication of events, and to foster the interaction between the participants, through an online community [2]. To support and enrich the realization of events, the system is also composed by a mobile guide that takes advantage of positioning and wireless communication. The events are leisure activities of touristic and cultural nature that take place in parks or in more urban contexts, like walks, or even more playful and competitive ones such as peddypaper games.

2. EXCITINGTRAILS/EVENTS
The *eXcitingTrails/Events* system involves the integration of two key applications (see Figure 1): *MobileEvents* and *WebTrails*. The *MobileEvents* is an application developed for PDA or PocketPC that supports and complements the experience of tourism in pedestrian trails, natural parks, and urban or historical areas. The system provides a richer and more complete experience, based on the integration of different content like events, trails, points of interest, and natural species. The *WebTrails*[2] is a web application that complements the *MobileEvents* and allows it to manage and update the content autonomously by the responsible entities.

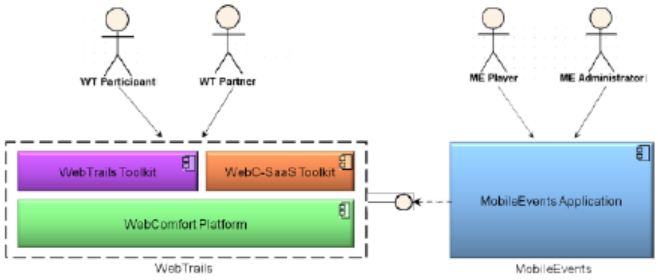

Figure 1: Overview of the system's components

Figure 2 shows the main concepts supported by the system. An Event is defined in a given Context. The Context represents a geographic area of interest (e.g., natural parks or urban historical areas), with a set of related data managed by a Partner. The system supports the following events: Peddypapers, Walks, and the Basic events. Each event can be created from an existing (or be used to create one) event template. When defining the *eXcitingTrails/Events* system we took into account the ability to reuse certain entities, like Species, PointsOfInterest, and Trails, in order to enable the integration with other more traditional touristic guide platforms. This independence between the entities allows for a context data to have different types of usage without having to redefine the same information. For instance, a Peddypaper comprises multiples PointsOfInterest, these already defined PointsOfInterest can afterwards be reused to define other Peddypapers or other types of events, like Walks.

[1] For more info see http://www.siquant.pt/portal/eXcitingTrails

[2] Public available at http://percursos.webcomfort.org

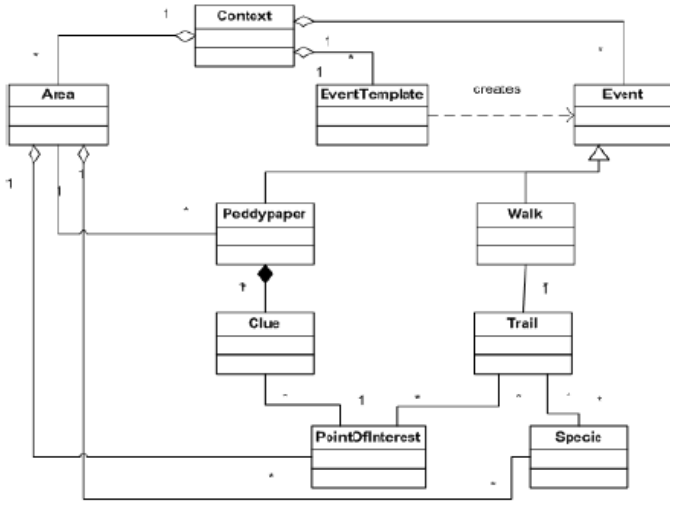

Figure 2: Domain Model of the *eXcitingTrails/Events* system.

The *Basic* is the simplest type of event. A museum exhibition is an example of such event: a person interested in cultural activities can search in the *WebTrails* portal for the ones available. Public events provide a description for everyone to see, which can contain location and contacts information and also links to other web page related to the event.

The *Walk* corresponds to the classic outdoor activity for tourism, is designed for those who like to walk outdoors and visit points of interest scattered along the trail.

Finally, thinking on the adventurous users, the third type of event is the Peddypaper is a complex event that requires the definition of clues and points of interest. Both types allow a participant to subscribe to the event and form a team of players.

2.1. WebTrails

The *WebTrails* is a CMS-based application provides two main services: the Context-Management and Context-Participation services. The Context-Management is the service provided to the Partner users and supports the creation and management of different types of content through the Context's page. The Context-Participation is primarily targeted to those who wish to participate in the published events, keep information about past events and be part of a small community. This service provides a Participant's page where the users can access the events they subscribed and participated in the past. Through this page, they can export the subscribed events and install them on the *MobileEvents*.

In the following we explain and discuss the key features and concerns that influenced the WebTrails design.

Content Management. The *WebTrails* application is a public portal that provides access to all kinds of information. The information that is visible depends on the user that is accessing it and its assigned role in the system. All the participants have access over a profile page which they can configure to whether or not be available to all the other users. In this profile page they can also configure which information is made public and which is not. The Context-Management's responsible entities (the Partners) can access all of their information and created content through the web. They can login with different users which (depending on the assigned roles) can give them permission to: see the content, modify the content, assign roles and configure the portal. The participants are allowed to subscribe to events published by the Context-Management's responsible entities. These users can subscribe to the Context-Participation service and have access to their past events, to their current subscribed events, to their favorite contexts, and also access to acquire the MobileTrails or *MobileEvents* license. The Visitor users can view the content that the participants wishes to make public, contexts content, user's profile pages, user's subscribed events, user's favorites, etc.

Socialization. The participants can provide other users with information about their past events and events that they're currently subscribed to, and also their user's profile information (all of this depends on the user's configuration). Additionally, they can comment on the event's page they participated in and see other users' comments.

Communication. The participation in the events using the *MobileEvents* application requires, in one main situation, the transfer of specific information from the mobile application to the *WebTrails* server. This situation refers to the results of the teams that participated in the events, in which case the user is able to choose between three options: manually, GSM connection or Wi-Fi connection. In Section 4.3 the communication between the two components is complemented.

Security. All the information publicly available in WebTrails, user's profile pages and pages that derive from subscribed services can be made private according the responsible user's preferences.

2.2. MobileEvents

The *MobileEvents* is a mobile application that supports the events realization, previously transferred to the mobile device, helping the user during its execution. The owner of the device can thus visualize the info about each event and, at the date of realization, start the event on the portable device. He can also check past events and his results.

Content Management. The content created in the *WebTrails* portal can afterwards be exported by a participant that subscribed the Context-Participation service, to an XML file. This file contains all the information related to the user's subscribed events and it's used to show all that information on the mobile phone.

Positioning. The realization of some events depends on the user's current location. For example, in the case of the peddypaper, the game requires information that notifies if the user arrived at a certain location so that the next clue is presented and so forth. In the case of the walk event it is used for orientation, presenting a map with an icon on the user's location. Additionally, on the peddypaper, it is also used to discover if the user is near a certain point of interest.

Communication. Although the advance of technology, it's still frequent the use of mobile devices without a Wi-Fi connection. Even when it's present the battery life decreases considerably, and the use of a mobile connection such as GSM can incur in great costs for the user. For these reasons in the majority of time the application *MobileEvents* is working in offline mode. There are two main situations where the communication with the *WebTrails* server is required, one is to transfer the content of the user's subscribed events to the mobile phone, the second is when the user has to receive a confirmation code to start the event.

Security. The system described in this paper uses the GPS technology to guide the user through a map of the specific region, available for the users, intended for orientation. However, it is possible that the user gets away from the region in which the event is taking place. In order to maintain the security of the player, there is a mechanism that detects if a player is outside of the region of the event and notifies him, periodically, of this incident until he gets back into the area shown by the map.

3. PEDDYPAPER EXECUTION SCENARIO

The execution of a peddypaper event requires a connection to the internet and a windows mobile device with GPS. The Internet connection is necessary to create the data (Contexts, Events, Trails, PointsOfInterest and Species) by a Partner, and afterwards to export this data to the mobile device by a Participant.

The Participant has free access to the mobile device application, the *MobileEvents*, downloaded at the *WebTrails* portal. The download of the created data may be subject to payment of a license, depending on the Partner who created these contents.

After installing the application and exporting the data to the mobile device, the Participant has access to the available events information. Depending on the type of event, its execution is different. The realization of certain types of events depend on the *MobileEvents*, the device's GPS connection and have a specific date of realization, while other types, such as museums exhibition, don't.

The following discusses the execution scenario of the Peddypaper game, which suggests how the system works altogether.

3.1. Event Definition & Schedule

The events are defined through the *WebTrails* portal by the Partner (see Figure 3). The peddypaper can be created from scratch or use an event-template previously created. An event-template can be created from scratch or through an already created event, and can be reuse. The templates are only available for the Partners.

Figure 3: Peddypaper event information page.

In the case of a peddypaper, its creation includes: definition of Clues and Points of Interest as well as its schedule and area where the peddypaper will take place.

3.2. Event Realization

After scheduling a peddypaper, it is announced in the portal and the subscriptions are opened. Anyone can access the portal and see the public announced peddypapers. All participants can subscribe and participate in the game. Close to the realization date of the event the subscriptions are closed.

On the event's due date, the Participants must have a windows mobile device (one for each team) with the *MobileEvents* application installed and the event's content exported from the *WebTrails* portal. At the beginning of the game, a first Clue is provided by the application to its players. The Clue can require a player to get to a certain point of interest or to select the right answer in the PDA. As soon as the player unveils the Clue, the next Clue is provided, and so on. Along the tour the set of Clues associated to the peddypaper is presented. Using the GPS coordinates system, the *MobileEvents* detects the location of the user and provides the information as the user approaches a specific PointOfInterest. Thus, the user travels throughout the area and at the same time gets to know it, through the contextual information the Clues and the PDA provide. The users also have access to a digital map where they can view the Points of Interest related to the resolved clues.

The result of the game, i.e., which team won the game, is based on their total points. Each Clue has a score which will be added to the current player's score. The total points of a team are calculated as the sum of all points received for each Clue resolved. If there is a tie, the team who finished first wins. After the event, the results are publish in the portal by the partner and are available to all participants.

3.3. After Event Realization

After the event realization all Participants are entitled to a personal page where they can access information about all events they participated and subscribed, view results and make comments (see Figure 4).

Figure 4: The participant profile.

The Participants can favorite other users and follow their activities, view which events they subscribed and liked most. Additionally, they can favorite Events, Trails and PointsOfInterest and keep track of any changes. And so, they can access directly to these resources available in the portal.

4. VALIDATION

To validate the *eXcitingTrails*/*Events* project and its features, we conducted different experiments that are further described in Belchior's MSc Thesis [9].

WebTrails. To validate the *WebTrails* application, the Context-Management and the Context-Participation services were deployed in a production environment with the intention of promoting and collecting information about these features. Both services are being evaluated by the Partners of two existing contexts, namely Parque Nacional da Peneda-Gerês and Parque Natural Sintra-Cascais, two important natural parks in Portugal (see Figure 5).

The two services are directed to different types of users, the users that create the content available subscribe the Context-Management service, and the users that participate in the events subscribe to the Context-Participation. For this reason, and

because the previous version of the *WebTrails* already allowed the creation of certain types of content, the validation of both services was conducted independently.

Figure 5: Peneda-Gerês and Sintra-Cascais Context's page.

MobileEvents. The validation of the *MobileEvents* is more complex because it requires the users' presence in the region of testing. There are no concrete results so far as the application is still under evaluation (see Figure 6). However the feedback has been very positive. The validation of this system's component starts with the application already installed and the contents already transferred to the mobile phone. The first tests were conducted with our colleagues at work that experienced a participation in a peddypaper event supported by the *MobileEvents* application.

Furthermore, the students of Instituto Superior Técnico, in Lisboa, will have a chance to participate in a peddypaper created by us together with its Student Association.

Figure 6: Peddypaper at IST and walk at Paradela in MobileEvents.

5. CONCLUSION

We studied and analyzed existing solutions and models of mobile guide applications [1, 3-7], and proposed a new approach on how the users get information about cultural activities, and how they can participate in these activities and exchange information among themselves [9]. The practical outcome of our work is a standalone mobile application (*MobileEvents*) and extensions to an existing web application (*WebTrails*). Our system supports the creation of different types of content and the usage of that content in the creation and publishing of different events, directed to activities of touristic or cultural nature. It also encourages the participation in the available events with friends, forming teams. The users can keep track of their past events, rate and comment the events they participated in, as well as view other users' comments and events.

We believe we achieved something new and appealing for users interested in cultural or outdoors activities, and provided a system that enhances and raises interest in these activities. Because it is a work in progress, a lot can be improved and new features can be defined to add value. Nevertheless, it is already a working project, being used in real life scenarios and with an interesting future. The results and feedback from users has been positive which encouraged us to continue this work.

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