Title

QR Marks the Spot

Abstract

We challenge project teams to create location-based games that blend real and virtual worlds into a single, gaming world. Such location-based games shall be hosted on a web-based system that offers a public environment allowing users to create games of various types (based on offered templates), and play them in the “real world” amended with QR codes. Using mobile devices equipped with QR readers, players move and act in the real world, trying to achieve goals and successfully finish games, while the game scenario is controlled in the “virtual world”, by the game server and chosen game scenario.

Introduction

Social networks and 'social' games (think Facebook, The Sims and World of Warcraft) have been a big boost for the popularity of Internet and also demonstrated that people have come to expect the *social* aspect in any application or game they use or play.

A great example is the game of GeoCaching (http://www.geocaching.com/) – often described as a “game of high-tech hide and seek”. The goal of GeoCaching is to locate and discover a small *cache* (container of some sort) hidden by an unknown person in an unknown location (for example city, woods or mountain), with the help of Global Positioning System (GPS). Locations and brief descriptions of such caches are publicly announced on the Internet. Caches exist on all continents and are frequently placed on locations that the cache owner feels are interesting to visit. Cache-explorers can enjoy themselves in an outdoor modern-age treasure hunt, often enriched with various puzzles. Once found, a typical cache contains a miniature visitor log and perhaps a few trinkets that founders can keep as trophies or take to another cache.

The basic idea of this project is to develop a site for creating and hosting location-based games (although it could be used for other purposes as well). Web technologies shall be used to address “virtual” portions of games, while two-dimensional barcodes (such as the QR code shown here) and mobile devices equipped with QR readers should be used as game “extension” in the real world. QR codes shall be used as markers for both location marking and/or item tracking. Software capable of scanning 2D bar-codes is available a vast majority of mobile phones, which makes it possible for almost anybody who owns a camera-equipped mobile phone to participate in games.

The primary domain of the QR-based gaming are location-based games - a series of physical locations amended with QR markers can represent a “real world” game space where different gaming scenarios can be employed, while game logic resides in the “virtual” world. Such scenarios can include treasure hunting, revealing secrets, but can also include other more educative scenarios such as city tours, educational tours – it is up to a project team to come up with innovative, attractive and realistic QR-based scenarios. Game scenarios can also require individual players to act selfishly, to create competing groups, but they can also require all players to cooperate in order to successfully finish the game. Also, scenarios can include dynamic environments, where QR codes can be used to mark non-static objects.

Project goals (requirements)

The project should result in a public web-site for hosting QR-based games. The same site can define one or multiple game types (templates), and can allow registered users to create and manage their games. The idea is to allow a broad community of QR-based game players to create games based on supported game types, exchange ideas and experiences, conduct games, communicate during game play, and to display/achieve game results. Game types (or other useful applications of such a system) are intentionally not addressed in the project requirements, and are left to the imagination and research of project teams. Game scenarios should (at least partially) take place in the real world and the game content should be user-created (anyone can create/extend their own instance/piece of the game). Participants should be able to involve themselves both as game creators (e.g. post items/puzzles/tasks for others to find or solve), or simple players. Participants should be able to communicate through the game web site.

Various existing APIs should be used to help participants play the game (e.g. Google Maps, portals, Facebook, Twitter) and to give them familiar user interface. 2D bar-codes should contain short text messages (e.g. clues, hints, puzzles, URLs, ID tokens) and should be used to provide important location or item-based game information.

Availability of GPS devices on participant's mobile devices must not represent a requirement for game participation, nor should the participants be forced to use data communication during the game (playing a game should not require players to suffer costs of any kind unless explicitly allowed by the player).

Intended output of the process (process focus)

Although we recommend employing an iterative development process, participating project teams are free to choose the development process they like, but must provide evidence that will prove their adherence to the chosen methodology. Required evidences include, but are not limited to a standard set of documents for a particular methodology (for example: project plan, requirements, vision, architecture, test plan document etc.). User instructions are also required, and should be a part of the final product (on-line help for system users).

The project deliverables, beside required project documentation, must include the following artefacts:

- Basic idea for at least one game type, including a short description document (per game)
- A fully functional web-site for hosting games, with online tools for game creators and participants (such as mapping tools, blogs, forums etc.)
- At least one game type (template) available and one game instance created
- Source code of the project
- Installation package and installation instructions

The deliverables must also include an evidence of a successful live run of at least one game scenario. The evidence can be provided in various forms such as a report, a collection of statements/interviews of the game participants, a video recording etc.

We also encourage that the following requirements are also met:

- UML should be used consistently throughout the project documentation
- Version management (such as SVN, CVS or similar tools) should be used

- Automatic testing tools should be used

Tools and standards

We encourage project teams to use Free/Libre and Open Source Software (FLOSS) components in this project as much as possible. We also strongly advise that as much functionality as possible is included in the application in a form of a mashup: publicly available services providing a significant portion of a specific (and hard to implement) functionality (such as terrain maps, routing, graphs etc). are very welcomed.

QR readers are available for almost all of the mobile platforms, so using QR-enabled devices for live testing and game runs should not present a significant technical problem or a financial obstacle.

Interaction between stakeholder and developing teams

The contact persons for the QR Marks the Spot project are Igor Čavrak (igor.cavrak@fer.hr) and Marin Orlić (marin.orlic@fer.hr). They will be available for questions regarding project throughout the year with the exception of vacation days. Please note that your questions will probably not be answered on a daily basis (rather once or twice a week), so it is advised that you collect all your weekly questions in one mail.

There should also be a web page dedicated to this project on http://www.fer.hr/rasip/score/qr, where general information and frequently asked questions will be published, as well as discussion forums hosted.