Mobile Application Development for Promoting Usage of City Trails

Scott Weidenkopf  
Indiana University - Purdue University Fort Wayne

Grant Grimm  
Indiana University - Purdue University Fort Wayne

Warren Barnes  
Indiana University - Purdue University Fort Wayne

Follow this and additional works at: http://opus.ipfw.edu/stu_symp2016

Recommended Citation
Weidenkopf, Scott; Grimm, Grant; and Barnes, Warren, "Mobile Application Development for Promoting Usage of City Trails" (2016). 2016 IPFW Student Research and Creative Endeavor Symposium. Book 56.  
http://opus.ipfw.edu/stu_symp2016/56
Introduction

Our software development team is building a mobile application system for The City of Fort Wayne Greenways and Trails Department as part of our Senior Capstone requirement. The City of Fort Wayne Greenways and Trails Department desires an app that will allow trail users to submit their usage data to a centralized database. With that data, the Department can continue development of the trails according to usage patterns of the users. Our system includes a mobile application available for both iOS and Android devices, a database, a REST API web service for communications between the apps and the database, and a web application for visualizing the data in the database.

Features

The mobile application will have the following features:

- Account system for persisting users’ data.
- Activity recording:
  - Google maps display with Trail Network overlay.
  - Location updates using GPS.
  - Activity distance, duration, calories burned, and speed updates.
  - Tabularized view of earned achievements.
- Static map of Fort Wayne Regional Trail Network.

Methods

- Rational Unified Process (RUP)
- Test Driven Development (TDD)
- Rapid prototyping
- Relational database normalization

Technologies

- Android/iOS Operating Systems for mobile devices.
- Google Maps APIs for iOS, Android, and JavaScript.
- RESTful API.
- Microsoft Windows Server operating system for server.
- Microsoft SQL Server for database.
- Microsoft .NET and Visual C# for web service.
- Bootstrap and Vanilla.js for web application.
- Espresso UI Testing Framework

Database

The above image is the relational schema for our database. The relational schema models the entities the database will store; each entity has its own table (or box), and arrows denote the relationships between the entities. Because data is the primary goal for our project, all of the other components are designed around this relational schema.

Acknowledgements

Dr. Beomjin Kim, Project Advisor
The City of Fort Wayne Greenways and Trails Department, Sponsor
Amy Hartzog, Dawn Ritchie, and James Haley; City of Fort Wayne Consultants
IPFW Department of Computer Science, Host and Materials

Web Application

The web application serves as a visualization tool for data gathered from the trail users. In the above screenshot, a heatmap highlights areas traveled by trail users and a table displays a summary of the total trail usage.