The TRavel Itinerary Planner (TRIP)

Overview

The TRavel Itinerary Planner will be developed in two stages: a basic rapid prototype to demonstrate functionality using the Appalcart bus system and an expanded system with different user interfaces, a different storage methodology, and adaptable to other transportation systems. The system should be flexible enough to allow future enhancements, such as real time tracking of public transportation vehicles. The system will be developed cooperatively at multiple universities.

Problem Statement – Basic System

The user will provide the starting bus stop, the destination bus stop, and the desired arrival time. For simplicity, the initial system will be constrained to a single transfer point, if needed, and transportation will be on the day of use. The user interface should provide rapid input of the necessary information. In the event that the user does not know the starting or destination bus stops, maps of the Appalcart routes will be available for examination. The resultant itinerary will be displayed as a simple list of instructions. Persistent storage of all bus route information will be in an XML file (this file will be given to you). The language of implementation will be Java. The basic system will be completed by October 7, 2005. This rapid prototype will be developed entirely at Appalachian State University; students at North Carolina A&T will develop a similar prototype for the Greensboro bus system.

Problem Statement – Expanded System

The expanded system will involve multiple universities working together to develop the TRavel Itinerary Planner using a three tier architecture. In particular, DePaul University in Chicago will work on alternative interface systems (the presentation layer), North Carolina A&T in Greensboro will develop an SQL database system to store route data (the storage layer), and Appalachian State University will work on increased functionality of the itinerary logic (the business logic layer). The course at DePaul is during the winter quarter (DePaul is on the quarter system), so there enhanced telephone interface will not be available by the end of our Fall semester.

In the expanded system, the user can specify the starting location and destination in a variety of ways, such as a street address or a location on a map. The itinerary system will instruct the user how to get to an initial transportation stop, how to use the transportation system to get to a termination stop (similar to the basic system), and then how to get from the termination stop to the final location in order to arrive at the specified time. Multiple transfer points are allowed and the user can specify any day of travel. Several alternative routes will be generated based on different constraints (quickest, fewest transfers, etc.). The itinerary will be available to the user in a variety of formats, including a list of directions or a map or both, all that are easily printed. In the case of a telephony interface, the system should be capable of calling the user with an “its time to leave” message and a verbal list of instructions. A call back number will allow subsequent retrieval of this information.

To insure maximum flexibility of the system, two primary web services will be developed during the expanded phase: a storage web service to be used by the business logic layer and a business logic web service to be used by the presentation layer. These web services will use SOAP (Simple Object Access Protocol) which means the services might be developed in any appropriate software environment (thus removing the Java-only requirement of the basic system). An administrative subsystem should allow entry and maintenance of the route data, including input of special circumstances such as “delayed by 15 minutes.” The system should be adaptable to other transportation systems, such as the Greensboro bus system or the Chicago train system. The expanded system (minus the telephony component) will be completed by December 7, 2005.