IPRO 305 Final Report

MYWAY: A PERVASIVE COMPUTER APPLICATION
Spring 2006

Introduction

IPRO 305 is, at its heart, a pervasive computing IPRO, although it has strong ties to other computing applications. IPRO 305 has a long history with the IIT IPRO Program and this will not likely change in the coming semesters.

IPRO 305's goal for the spring semester of the 2005-2006 academic year was to further and complete the development of myWay. myWay is a tour system designed to be integrated with Segways that allows users to take totally guideless tours. myWay allows users to explore and experience a tour location in an entirely new way. myWay encourages exploration rather than following.

Background

IPRO 305 started a few years ago with HawkTour. HawkTour is an application that allows IIT students to explore and interact with smart devices inside a smart building such the MTCC. HawkTour was designed to be run on a tablet that was held and interacted with by the user. Even though the HawkTour and myWay may seem like unrelated projects the experience gained from HawkTour was extremely helpful in designing myWay.

Last semester, Fall 2005, myWay was built with the intent of using IIT as a proving grounds for the technology. myWay was built in such a way that the system could easily be used for giving tours downtown. Initial issues of User Interface, mounting, computing devices were discussed and resolved.

Purpose

The purpose of IPRO 305 during the 2006 Spring semester is to take myWay and make it work for a Chicago environment. This has implications of:

- A different user base. The users are no longer prospective IIT students, but tourists of Chicago as a whole. Thus, the content changes.
- Much bigger. The area that myWay is allowed to cover is much bigger in a Chicago environment. More content, bigger maps and so forth.
- Cost. If the system is to be deployed by a business it has to have a business incentive. Thus, the cost should be kept to a minimum.
- GPS Accuracy. Chicago has huge skyscrapers that block the view to the sky. IPRO 305 must consider how well GPS will function in this environment.
- Deployability. If myWay is to be a commercial success it must be easy to create and modify the content. Thus, an application needs to be developed to allow tours to easily be created and modified.

Methodology

Due to the fact that myWay was, in most cases, functionally complete our methodology was more from a testing and refinement stage.

To address the issue of a different user base the team had meetings with our sponsors to discuss the type of content they would like to provide. From these meetings we were able to gain an understanding of our target user base and provide accurate, informative content to them.

In order to compensate for the vastness of Chicago some of the software had to be rewritten. Specifically, the previous way myWay was drawing and displayed the map would not work for Chicago. Thus, the Software Development team investigated and researched just about every mapping solution they could think of. Ultimately the SD team decided to go with and implement Microsoft MapPoint which allowed for a high degree accuracy and customization.

The Hardware Interface team investigated several hardware solutions that could cut cost. A new tablet had just come on the market that would fit our project very well and cut cost by three times. Thus, the tablet was acquired and used for testing. Also, in order to provide more mounting features the HI team investigated and built a new mounting solution that used off the shelf components to provide an easy and cost-effective way to mount the tablet to the Segway.

The HI team also investigated SiRF GPS technology. This SiRF technology allows for a much higher degree of accuracy in urban environments.

One of the greatest accomplishments of the semester was the myWay Tour Designer application built by the Software Development team. This application allows users to quickly and efficiently create tours in a matter of hours. Thus, myWay can be deployed anywhere in the world within days, not weeks or months like other touring systems.

Assignments

IPRO 305 was divided into three main teams: User Experience (UX), Hardware Integration (HI) and Software Development (SD). Also, for various tasks that lay outside these teams executive committees were formed to complete these tasks. The following is a list of teams and their members:

Leadership
Members
Dr. Sun – IPRO Advisor
Dr. Sato – Institute of Design Advisor
Alex Pope – Student Leader

Tasks
Organize and lead the IPRO 305 team to meet their goals.

Software Development
Members
Marcin Jastrzebski – Team Lead
Mike Gabel
Anton Varshavskiy

Tasks
Investigate text-to-speech conversion.
Integrate new map engine (Microsoft MapPoint).
Fix any bugs that crop up during testing.
Build myWay Tour Designer application.

Hardware Integration
Members
Jodel Charles – Team Lead
Douglas Gergees
Kyu Hun Kim
Vincenzo Procaccio
Jeevan Vijayan
Taylor Williams

Tasks
Investigate new, cheaper tablets.
Investigate SiRF GPS devices.
Develop new mounting system.

User Experience
Members
Natalie Orrison
Jeri Siragusa

Emily Sutherlin

Tasks
Update and create content for sample Chicago tour.
Refine interface design as needed.
Produce marketing and IPRO day verbiage for website, posters, presentation and so forth.

Creative Committee
Members
Douglas Gergees
Jeevan Vijayan
Taylor Williams

Tasks
Create website, posters, booth layout and PowerPoint layout.

Obstacles

Perhaps the biggest obstacle that the IPRO faced was attendance. Even though the initial handout to students specifically mentioned that attendance was factored into their grade some students still didn't attend regularly. The problem was addressed on a student-by-student basis. If deadlines were not met then stern warnings were issued to remedy the problem. This solution, although reactionary, worked well.

The second problem is a technical one. Although Microsoft MapPoint does a lot of good things for myWay, it is also incredibly hard to program against. Anton and Marcin were both able to figure out the complicated programming model to produce stable, working products.

The third problem was an issue of sponsorship and money. Our supposed sponsors, Segway of Chicago, where unable and/or unwilling to provide capital for our purchases such as mounting tools, software, and so forth. However, they did provide excellent feedback for our project. The money issue was resolved by help of Dr. Sun and the IPRO office.

Results

The biggest result of this semesters work is a working product that is able to be deployed anywhere in the world within a matter of days. myWay was demoed in front of our sponsors and they loved it. At this point myWay is a mature product that is able to deployed and used in a production environment.

Secondly, IPRO 305 has provided a set of sample content for a Chicago tour so that future tour designers may utilize the content to create better and more encompassing tours.

Furthermore, the Hardware Integration team successfully proved that an effective mounting solution could be found and used.

Recommendations

The next step for IPRO 305 is to become an EnPRO. By utilizing experience gained in designing and implementing a tour for Chicago the team can move forward and attempt to gain a foothold in the tour market with myWay

Also, as a result of the experience of developing an application like myWay additional touring applications can be developed to further the business.

In order to succeed as an EnPRO the team must further investigate how the product will be sold and used. Furthermore, it must conduct accurate market analysis to know at what price points the product can be sold to be a good value to Segway touring shops. A large market exists for this type of product, the EnPRO just needs to understand how to sell it.

References

For all references and guidelines please refer to the IPRO 305 wiki:

http://omega.cs.iit.edu/~ipro305/wiki/index.php/Main_Page

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