Blackfoot Crash Reporting System

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2. EXECUTIVE SUMMARY

We believe that the current system demonstrates the ability to produce an accident reporting system with a database on the backend, and that it could be used successfully. The difficulty seems to be in producing a system that is widely acceptable. Cordell Ringel reported that there are wide discrepancies in the forms used by tribes in Montana and other Western states, and there is no agreement on the data that should be collected and reported. So the biggest challenge is finding a solution that is flexible enough to be adapted to the needs of individual tribes. We believe that it is possible to do so by using XML and creating a system that has a front-end process for creating the desired forms.

A Tablet PC would be an ideal platform, as it provides either keyboard or touchscreen input, but a laptop computer could also be used. Java, being platform independent, will work equally well on all of them, although Java is certainly not the only possible software implementation system. Whatever is chosen, it must provide relatively sophisticated graphics handling for the drawing requirement, it should have the ability to easily handle form types, such as drop-down menus and choice buttons, and must be able to interface to a database system.

3. INTRODUCTION

The reporting of automobile accident statistics from Indian reservations is very poor. While the reservations are independent of State law and may not be required to report, the reservations themselves would be the primary beneficiary of more complete reporting as highway funding is often tied to accident data. By underreporting accident data the Indian tribes reduce their opportunity to get money for highway safety improvements that are obviously needed.

The reasons for not reporting are many. As independent jurisdictions, the tribes are not required to meet State guidelines for reporting accidents, and they often balk at providing some of the information that is normally required. The magnitude of the underreporting is unknown at this time.

The goal of this project was to create a prototype system to demonstrate the viability of using a small computation device to collect accident data and to provide a means for that data to be collected by tribal authorities. The objectives were to provide an improved means of data collection to encourage tribal authorities to collect data and to give tribes more control over the data released. Traditionally, the State accident report form was used, and it required information that the tribes might not want released to State authorities. By providing a computer database and reporting system, the tribal authorities would be able to collect all relevant data, but report only the data that the State needs to determine the safety concerns for highways on reservation property.

Cordell Ringel was involved in this project to provide an interface with the tribal authorities. He was separately funded but worked with us to help in assessing tribal needs and desires and to promote the goals of improved accident reporting. His report will be filed separately.

4. PHASE 1

Phase I was an attempt to create a data entry software package for a handheld device with an integrated Global Positioning System (GPS) receiver. The GPS was suggested as a means of guaranteeing correct location of accidents which are often misreported (in all jurisdictions). It was determined that the ideal situation would be an interface that was familiar to most people and easily maintainable. Using a web browser to provide the interface would meet this criteria. We also chose to use Java for the programming and graphics facilities rather than a proprietary solution (Microsoft .NET) or one of the popular scripting languages for Web (Perl, Python, Javascript). At that time, it was not possible to get a web browser on a Windows CE handheld that would support Java, so we decided to write the interface directly in Java. At a later time, it would be possible to convert the system to use a web browser for input and output if that is deemed necessary. It would be possible to do all of these things on a handheld computer running the Linux operating system, but we felt that is would be best to use Windows for the sake of maximizing familiarity.

During Phase I it became obvious that a handheld unit would be inadequate for data entry of a form as complex as an accident reporting form. There was insufficient space for entering data and the packed form was difficult to read. As tablet computers were on the horizon, we decided, with Steve Albert, to focus on a larger format and the system was converted to run on a standard PC which could be a Tablet PC or laptop PC.

The database portion of the project required that all data collected could be downloaded and stored in a database on a master system. This database can then be queried to report that desired statistics either electronically or by printing the report. The best database choice will depend on the wishes of the end users, and might vary between installations, but the prototype system used Microsoft Access.

5. PHASE 2

The second phase of the project implemented the complete State of Montana accident reporting form. This form is used by the State and some local jurisdictions to report motor vehicle accidents and was deemed to be a reasonable starting point. The Java interface provides for the input of all fields on the form, including drawings and the storage of the data in a temporary file that can later be moved to the Access database. Sample screenshots are shown in the appendix. All accident data would be downloaded to the master database, but only the desired fields would be reported to State authorities.

The GPS system worked on the Windows CE-based handheld, but could not be made to work on the standard PC due to driver issues that Teletype (the maker of the GPS device) was unwilling to correct. It will be important to find an appropriate GPS system for any future efforts if desired. It would also be possible to include photographic information directly in the report.

All software for the prototype is available on the WTI server.

6. APPENDIX A: SCREEN SHOTS OF THE ACCIDENT REPORTING DATA COLLECTION APPLICATION

Figure 1: Splash Screen

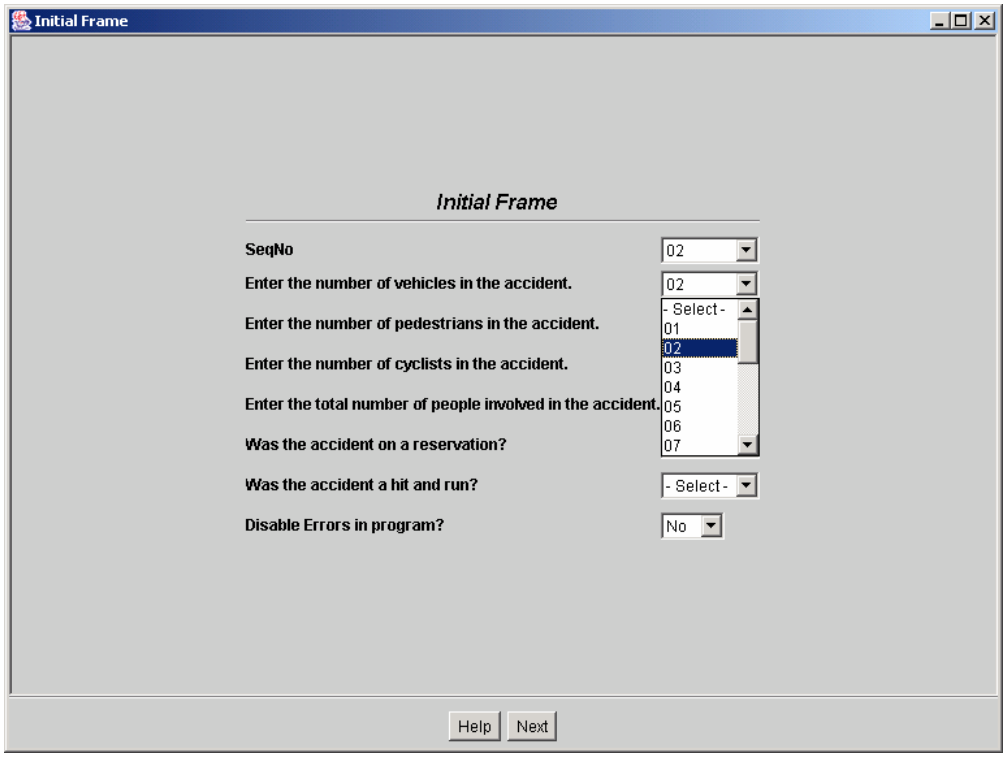

Figure 2: Initial Screen

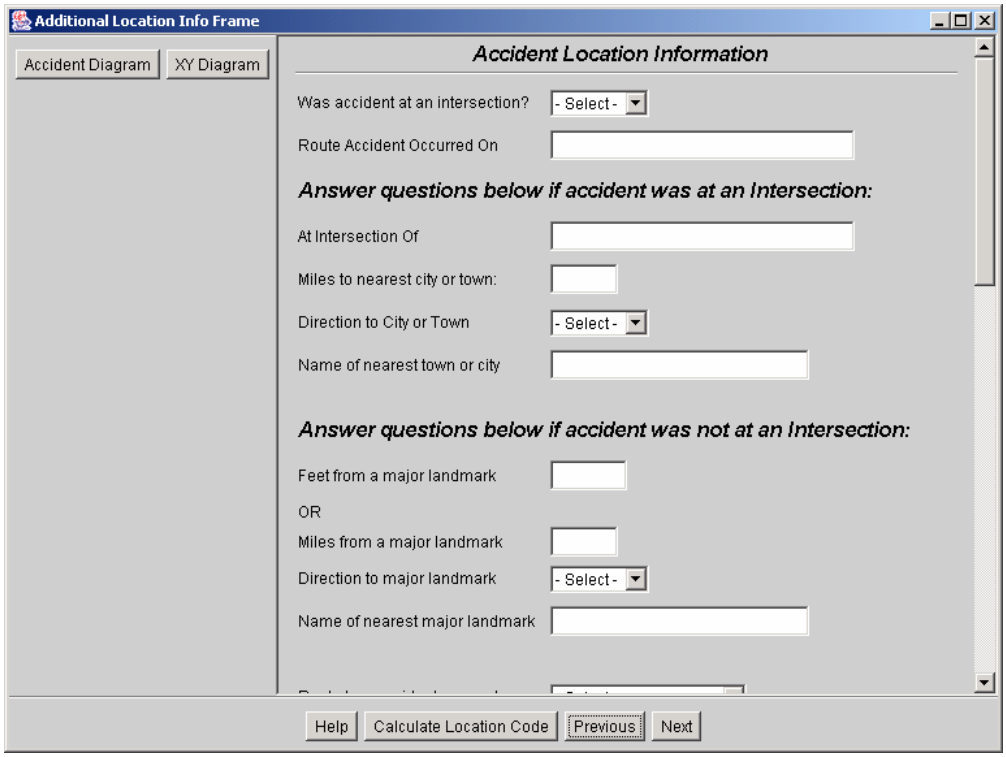

Figure 3: Accident Location

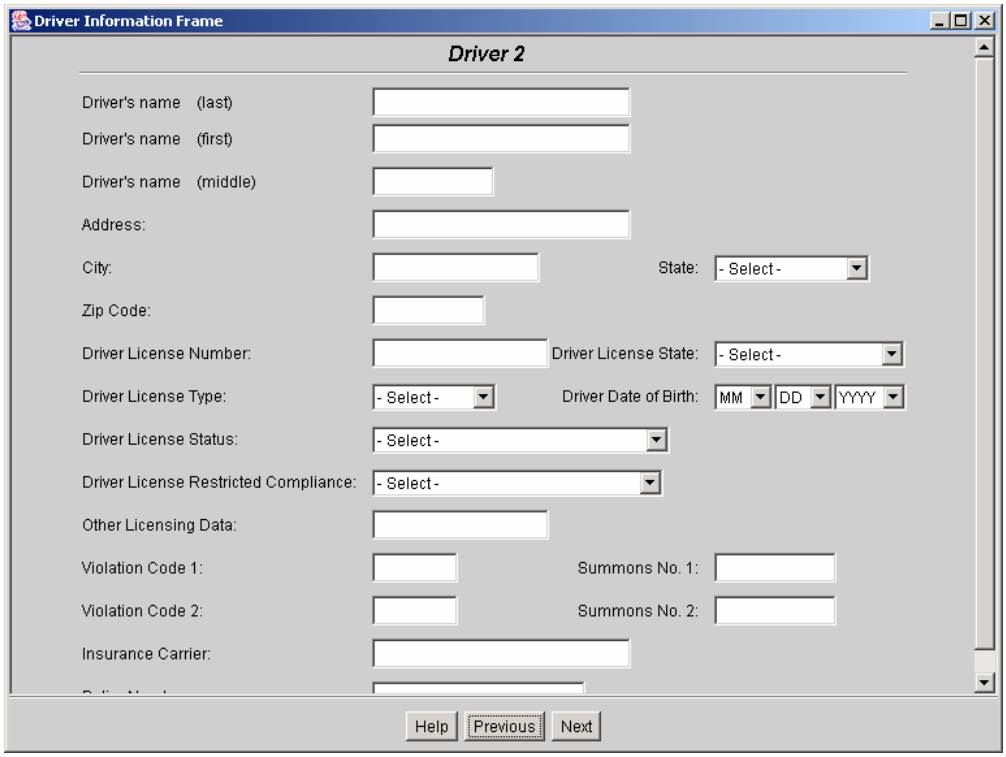

Figure 4: Driver Data

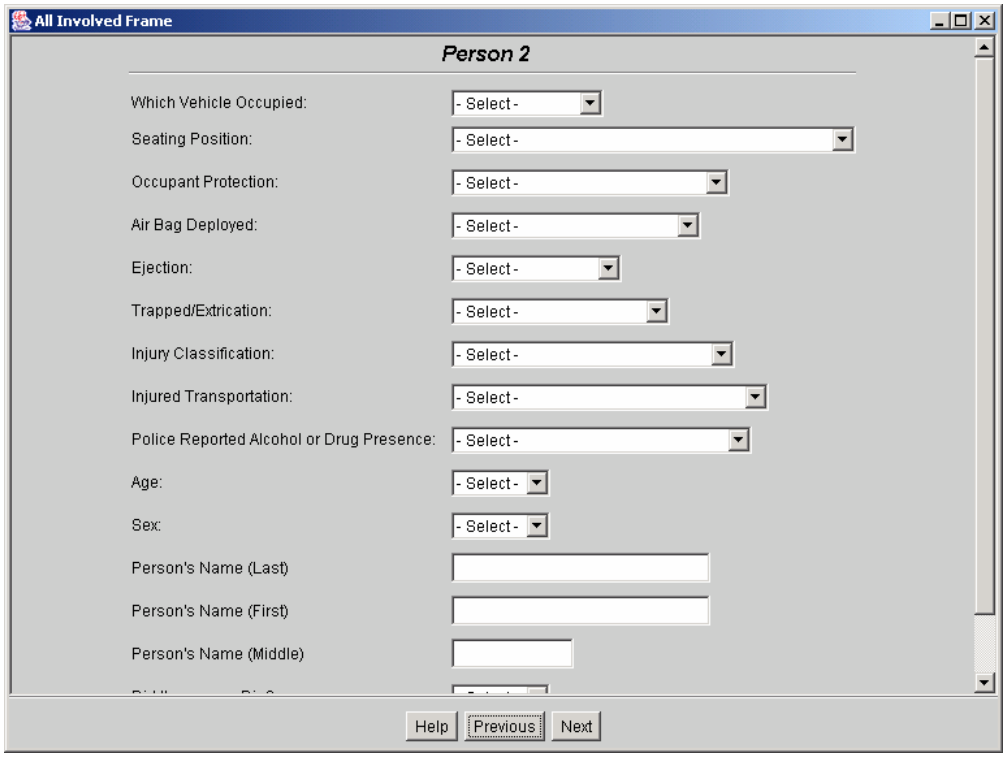

Figure 5: Person Data

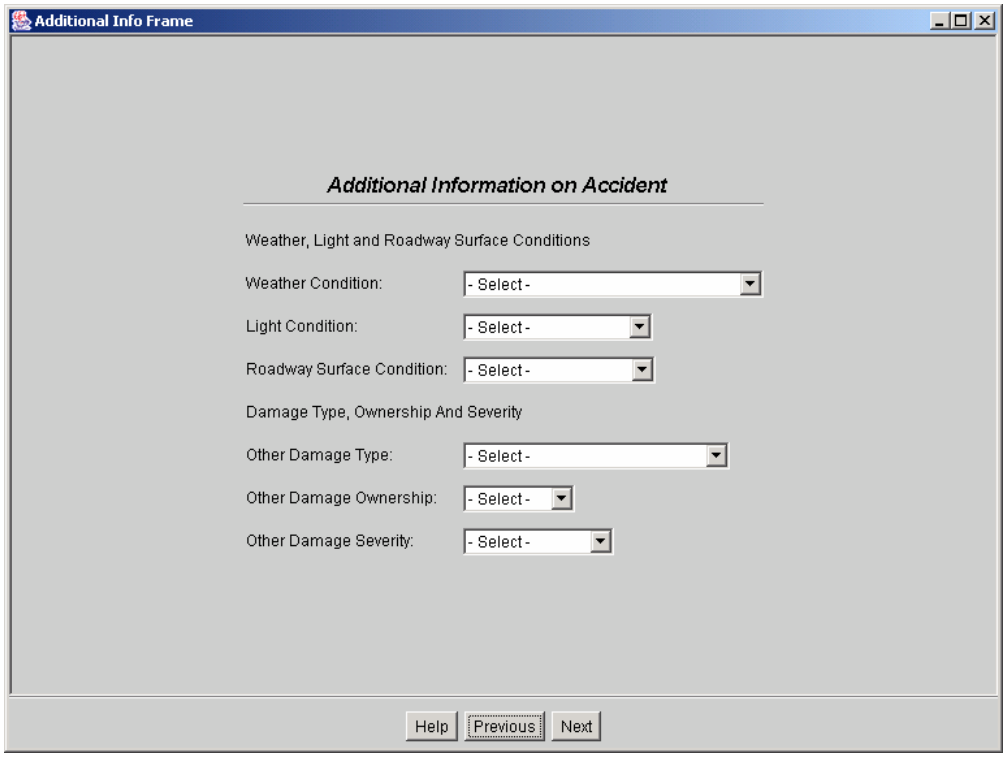

Figure 6: Conditions Data