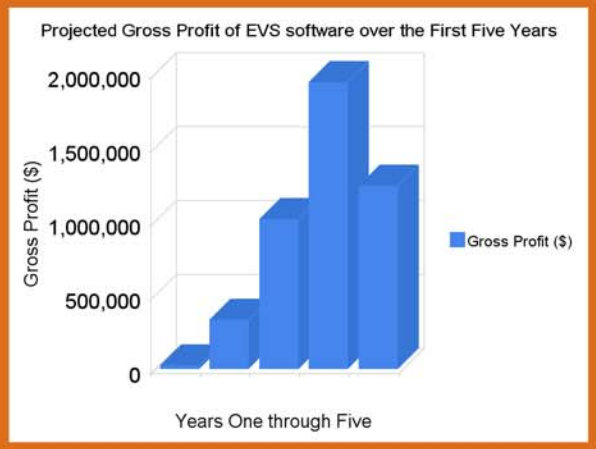
EnPro 355: Enhanced Visual System for Construction Safety

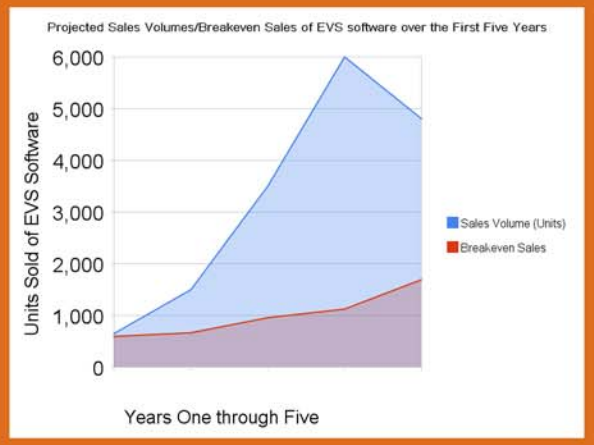
ILLINOIS INSTITUTE OF TECHNOLOGY

Business Model

The target market is inclusive of all companies in the construction industry that currently suffer from the problem our product will address.



The assumptions which come into play in this scenario, involve unit sales being based on 20% of the total market size being eventual consumers. The model also assumes that growth and decline will be normally distributed, leaving the window of high probability open for expansion into new products.

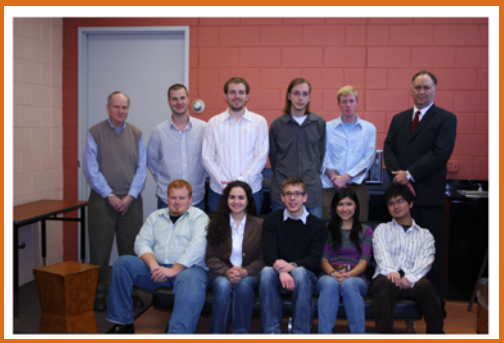


Ethical Issues

As a business oriented EnPRO, there were several ethical challenges faced during this semester. One of the issues that we faced was if we were to come across a patent for a product similar to ours, and that product wasn't being utilized; would we be morally obligated to proceed with our product in the interest of saving lives. Although we did encounter similar patents, we were never forced with making this decision. An unrelated alteration in our final product allowed us to proceed unhindered.

Another dilemma that we faced as a group was determining who should be included in a patent application, should we decide to proceed with obtaining one for our product. In the end, we have determined that the best course of action will be to map out which students are responsible for the concepts incorporated in the current design. Then, we will poll the remaining previously involved students to determine if any contributions have been overlooked.

As this EnPRO moves forward, progressing towards a final product, similar ethical challenges are perceived to arise. One of the most important decisions that will be continually faced is how to make this product available if it indeed saves lives.



Case Study

Place: Bridgeport, Alabama

Time: January 22, 1999, 10:02 AM

Cause: Gas leak of a 3/4" steel gas line from contact of excavation equipment.

Result: 3 fatalities, 6 seriously injured.
$1.4 million of property damage and loss.

Problem:

Dangerous accidents can occur from the puncturing or digging up of buried utilities by heavy machinery operators. This invariably leads to additional costs and may result in the injury or fatality of workers, homeowners, or bystanders.

The current system of identifying utility lines relies on a third party with them coming out to mark using flags or spray paint that can easily be washed, rubbed, or dug away.

Market Need

The usage of a mobile safety device could potentially reduce the probability of utility line contact accidents happening. The research conducted by this team has shown that a high number of accidents occur each year worldwide. These accidents result in injuries and deaths, as well as extensive property damage and settlement costs.

The research conducted has found various products similar to the idea outlined in this document, as well as patents on similar products. Some of these products are widely used, such as location devices by Trimble, while others are for the most part are not commonly used, such as Guardian Pro Star. In analyzing the various companies' websites, products offerings, and financial statements, the team has determined that the majority of these companies have yet to gain awareness and fully enter the market. Furthermore, during the team's multiple interviews, the interviewees expressed no knowledge of these other products and strong interest in using a location device to make the job site safer. Those in the field felt that our product in particular would likely improve construction site safety.

Solution:

The goal of EnPro 355 is to develop a software application for a handheld device that can be mounted in construction vehicles. The application displays a 2-D map upon which utility lines are digitally superimposed, updating in real-time as the user moves. This application also shows a representation of the user's location and his or her selected safety range. The application also logs the time and location of the user. The focus for the Spring 2009 semester will be to take the legal, field, and research analysis of the semesters before and create the software product.

Features of EVS

-Software application for handheld device

-Provides imagery of utility lines on screen of device

--Can import utility line locations from standard data formats

-Mountable on any part of heavy machinery vehicle

-Easily detectable from vehicle for handheld use

-Provide a sound warning system to alert user of danger, or "do not dig" zones

-Potentially provide depth information

-Easy user interface, even for those unfamiliar with computers

-Personnel assistance to accompany the software-hardware package

Simulated view of EVS software

Trimble

Trimble is a provider of advanced positioning equipment, most notably working in the construction field. They supply various software applications that run on specifically designed hardware devices such as the GeoX Family.

Trimble GeoX Family

Trimble GeoX Family

-Integrated GPS
GeoXM 1-3 m accuracy
GeoXT <1 m accuracy
GeoXH <30 cm accuracy

-Utilizes Windows Mobile 6

-1GB onboard storage with integrated SD/SDHC memory card slot.

-Up to 10.5 hours battery life.