IPRO351: Project Plan

Alcometre-Advancing Technologies, Saving Lives

Shana Burnett
Minsung Choi
Faye Garfinkle
Phaedra Howe
Hyo Jin Kim
Briana Macon
Alicia Perez
Stephanie Salem

I. Team Charter

1. Team Information

Team Member Roster & Contact Information

Name	Major	Contact Information
Jim Braband	Staff Sponsor	braband@iit.edu
Shana Burnett	3rd year Business & Computer Engineer	sburnett@iit.edu
Minsung Choi	3rd year Chemical Engineer	mchoi2@iit.edu
Faye Garfinkle	4th year Biomedical Engineer	faye.garfinkle@mac.com
Phaedra Howe	4th year Biomedical Engineer	phowe@iit.edu
Hyojin Kim	3rd year Chemical Engineer	d_ni1004@hanmail.net
Briana Macon	3rd year Business	bmacon@lit.edu
Alicia Perez	2nd year Psychology & Pre-Law	aperez8@iit.edu
Stephanie Salem	3rd year Business	ssalem@iit.edu

Team Member Strengths and Expectations

Name	Strengths	Expectations
Shana Burnett	Great writing and communication skills, organized	Developing creative ideas to solve the identified problem, working with the team
Minsung Choi	Technology oriented, creating innovative designs from ideas	Work on communication skills and working in a team setting
Faye Garfinkle	Previous leadership experience, taken multiple lab courses, basic chemistry, physiology, and biology knowledge	To develop a cohesive team that works efficiently to establish the defined needs of those involved in the prevention of drunk driving
Phaedra Howe	Background in medical imaging and multiple lab courses, basic physics and physiology knowledge	To combine multiple areas of discipline to successfully determine a market and possible device for preventing drunk driving
Hyojin Kim	Thinking technologically and innovatively	Work on communicating with team and developing ideas to create a product
Briana Macon	Research and writing skills, great task management	Working on communicating with team members effectively and increase

		public speaking skills
Alicia Perez	Organized, Writing Skills, Hard worker, Psychology Background	To take information from last semester and further hinder drunk driving, conduct market surveys and research, work well with the team
Stephanie Salem	Leadership experience, developed listening skills, experience on opportunity assessments, business background in finance and marketing	To understand technological aspect of the product, such as how it will work and ways to develop it

The team is in the process of developing a logo to represent the Spring semester of IPRO 351.

2. Team Purpose and Objectives

The purpose of IPRO 351 is to create a product that discourages minors driving under the influence of alcohol that will act as an unbiased mediator that takes the decision of driving drunk out of the driver's hands. Our goal is to determine the most efficient, cost effective means to achieve this and to obtain, through surveys and continued research, a possible market that would be interested in the design.

IPRO 351 has developed a set of objectives for the Spring 2010 semester that include but are not limited to,

- Take Fall 2009 IPRO 351 final conclusions and reviews to build new semester's objectives
- Establish contact with multiple organizations involved with this topic
- Develop a non-biased survey for parents and outside sources
- Perform various interviews, possibly recording them for presentation purposes
- Continue research on technologies for chemically reading blood alcohol content (BAC) for prototype
- Research existing methods that could be implemented with prototype
- Understand demographics of this problem
- Understand and define parents' knowledge and feelings of the subject
- Solidify possible market for device

3. Background

This IPRO was created through an idea submitted by Kunle Apampa for the Idea Challenge Competition that takes place at IPRO Day. The Idea Challenge is sponsored by the Innovation and Entrepreneurship Academy (IEA), The Coleman Foundation, the Kern Family Foundation, and the Entrepreneurship Program at IIT. The Idea to Product Competition is an early-stage technology commercialization competition, founded at the University of Texas at Austin that recognizes unique product ideas with innovative technologies. We currently are only funded through IPRO.

Drunk driving is a very serious problem in the United States. Each year thousands of people die in alcohol related driving accidents. It is truly a burden to society. We cannot solve the problem of drunk driving, but we can hinder people's decisions to do so. That is why the focus of this project is aimed at reducing underage drinkers from getting behind the wheel. By specifying the problem we can begin to find a valuable product for consumers. Looking forward we are going to focus on three things: what the problem is, what our solution will be for the problem, and how our solution will be creating value for a relevant market. We are dividing our target markets into two groups: those that abide by the law and those who don't. For the law-abiding group, we are going to look into devices that parents would be interested in buying to prevent an underage child from being able to drive a car if there is alcohol in their system. These would be our voluntary customers. For those who do not abide by the law, we will look to implement a similar product that will prevent DUI offenders from driving while intoxicated because of a mandatory system.

Alcometre, the device presented in the previous semester, provides a non-invasive way to measure a person's BAC using low light waves providing the user with an ignition interlock device and service to prevent drunk driving. Not only is the infrared technology being used to measure BAC, integrated biometric technology was implemented to avoid identity issues with the BAC measuring devices. The technology Alcometre provides is more convenient than a Breathalyzer, and the infrared technology is more accurate and requires less calibration than the more commonly used breathalyzers.

The Fall IPRO 351 ran into a major problem last semester: a patent that covered the idea they were attempting to implement: Patent 7,616,123: "Apparatus and method for noninvasively monitoring for the presence of alcohol or substances of abuse in controlled environments", Patent 6,229,908: "Driver Alcohol Ignition Interlock", Patent 5,743,349: "Non-Invasive Optical Blood Alcohol Concentration Reader and Vehicle Ignition Interlock System and Method."

The biggest issue, if we choose to stay the same course of developing a noninvasive monitoring device of alcohol will be working around the patents. If IPRO 351 is able to come up with a specialized use that requires a custom design that has not been disclosed or contemplated by the prior patents, it may have a chance at creating a successful, non-infringing product. Note

that IPRO 351 may only gain protection for the part of its final design that is novel and non-obvious. If the final design incorporates any of the elements described in the existing patents, those elements must be licensed from the proper assignees. In order for IPRO 351 to distinguish its device from the patents that were just described, it must improve upon them. This can be accomplished by focusing on the specialization and refinement of its original idea. In patent law, an invention is patentable if it is new, useful and non-obvious. In order for a patent to be "new" or "novel," it must not be anticipated by a prior patent. A device is anticipated when each and every feature of the device is expressly or inherently disclosed by a *single* existing patent or other prior art reference. IPRO 351 has a chance at proving that its existing idea is not anticipated by any prior patents or any other published materials. It can accomplish this with even the smallest differences, such as the sensor placement or wavelength preferences. Furthermore, an existing patent can only anticipate if it enables a person of ordinary skill in the art to build the claimed invention. If IPRO 351 believes that an existing patent is impossible to make, it may argue that said patent cannot anticipate its own device.

Here are a few quick facts related to drunk driving—

- On average, someone is killed by a drunk driver every 40 minutes in the US
- Each day 36 people die and almost 700 more are injured in vehicle crashes that involve a drunk driver
- The total cost of alcohol related crashes is roughly $51 billion
- In 2006, out of 1,746 fatalities that included children, one out of six was killed by an alcohol impaired driver
- Half of all teenage fatalities are due to drunk driving
- About 30 % of Americans are involved in an alcohol related crash sometime in their lifetime
- In 2007 alcohol related fatalities numbered 15,387, or 37% of all fatalities. Alcohol related fatalities are down by 27% as compared to 1982.
- The top 5 states with the highest number of alcohol related fatalities are Texas, California, Florida, Pennsylvania and Illinois.
- About 81% of all drunk drivers are male drivers

The practical solution for Alcometre is to tackle and prevent a specified segment of drunk driving. We understand that we will not be able to stop drunk driving overall. Through current research we also found that drunk driving cannot be prevented behaviorally (the current mandatory meetings and tactics have not been effective in stopping this behavior)—it must be prevented through technological devices that takes the decision of driving after imbibing alcohol out of the individuals' hands (i.e. an ignition interlock system). We have split our teams into two groups: technology researchers and behavior researchers. The technology team will complete research to determine the most effective method for testing BAC, and to implement this technology into a device that can be used for our design idea. The behavioral team will be researching facts and statistics on why current methods for preventing drunk driving are not

effective. We are interested in exploring more options in addition to what Alcometre started with including devices that could measure basic symptoms of intoxication, such as slow reaction time, or a series of brain teasers that must be passed before the car would start. At this point we are open to new ideas and plan to engage the market to find out which would be most desirable.

The Fall IPRO 351 team gave us a good base for research on similar solutions and literature. They had a student studying to be a patent lawyer draft up a feasibility study on whether or not it would be possible for the group to overcome current patents similar to the original Alcometre idea.

We met with David Malham, a Victim Services Specialist for Mothers Against Drunk Driving and he gave us six books that he said will be critical to our research. They include:

1. *Drinkers, Drivers, and Bartenders: Balancing Private Choices and Public Accountability* (0226762807)
2. *Dying to Drink: Confronting Binge Drinking on College Campuses* (1579545831)
3. *Addiction: Why Can't They Just Stop?* (1594867151)
4. *Drinking in America: A History* (002918570x)
5. *Drink: A Social History of America* (0786707437)
6. *Understanding the Alcoholic's Mind: The Nature of Craving and How to Control It* (0195048784)

He also gave us various statistics packets and information on drunk driving, which were in paper form.

4. Team Values

IPRO 351 developed a list of the most desirable characteristics expected to be presented by team members throughout the project.

Open-mindedness

Role Model Performance: Recognizing that we have a very diverse group of students (racially, culturally, fields of studies, gender, etc.) and utilizing each of these areas. This means letting people be creative and bring up an idea or thought even if it seems absurd. This openness may create a brilliant idea that we may not have come up with when sticking to a one track like-minded thinking.

Unacceptable Behavior: Ruling people out completely or making fun or their ideas. This will lead to people not wanting to share anymore.

Assertiveness

Role Model Performance: Asking questions, speaking (when confused or not), stating ideas/opinions clearly, speaking with fellow group members, willing to take control over a certain part of the project and directing fellow members in how to help.

Unacceptable Behavior: Shyness and anxiety when one speaks. There are no wrong questions. If one has a shy personality, then unacceptable behavior would be to not try and break out of it and speak with fellow group members.

Community

Role Model Performance: Team members are dedicated to group and individual achievements. Team members support the project and the team. Members are able to come together and communicate successfully to develop ideas and implement them and adopt the mindset that we are one, so I can't get an 'A' unless everyone else does. If one member has failed we all have.

Unacceptable Behavior: Not giving full commitment to the project and team and working independently when doing everything. Not engaging in dialogue. Not having sympathy for the other members. Not caring about the success of the project and having a competitive mindset instead of a collaborative one.

Accountability

Role Model Performance: True accountability involves taking ownership of your work, do what you are expected to do. This means being on time for projects. For example if each group member was assigned a task and you did not complete it, you should not make up an excuse and lie to your group members. Lying will make the situation worse. The right thing would be to be honest and ask if anyone has time to help you with the material you did not finish. The perfect scenario for accountability would be if someone in the group was having trouble and as a team we help them in the right direction or find a solution for them, even if it wasn't our responsibility. When you are done helping them the solution is accurate and he/she understands what you did.

Unacceptable Behavior: The worst scenario would be you lie and say you finished it and you couldn't come to the meeting. If the group member would have told the truth we all could have helped and it would've been presentable the following day. Each group member should have an "owner's mentality" attitude.

Organization

Role Model Performance: Being on time and prepared for meetings with assignments and tasks completed and uploading necessary information to iGroups for team access of information.

Unacceptable Behavior: Being consistently late to meetings or missing multiple classes, assignments or tasks not being completed on time or ready to discuss by designated completion date, failing to share necessary information to the team (via uploading any documents or requested material to iGroups).

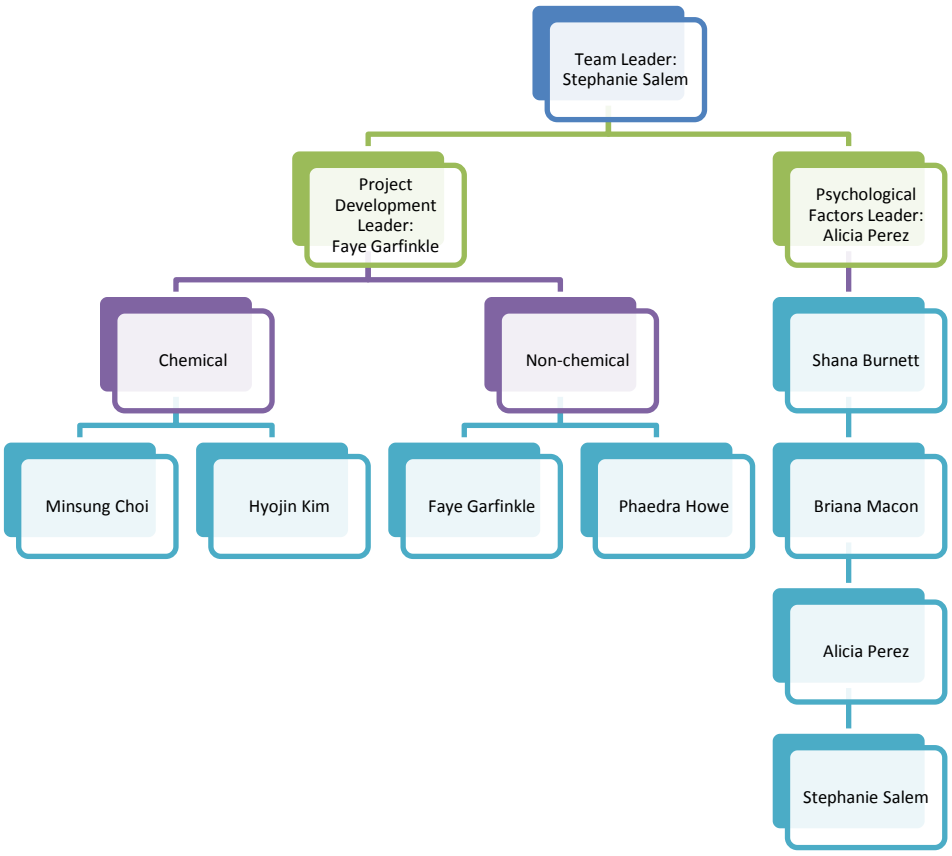
If a problem is encountered in the group, either by one individual against another or the group having issues with one individual, there were steps the team decided on as a course of action in such a case. If there are disagreements among the team it was decided that one member of the team would be elected as a mediator between conflicted individuals. Among sub-teams the leaders were to be in charge of ensuring members were staying on track with their designated workloads. If problems persisted, it was decided that the group leader would be notified of the ongoing problems, and as a final measure the individual would be removed from the class. As a team a pledge of positive intent was made, to ensure that all criticism would be taken as constructive, and would be given as necessary to ensure success within the project as well as in the working team environment.

II. Project Methodology

5. Work Breakdown Structure

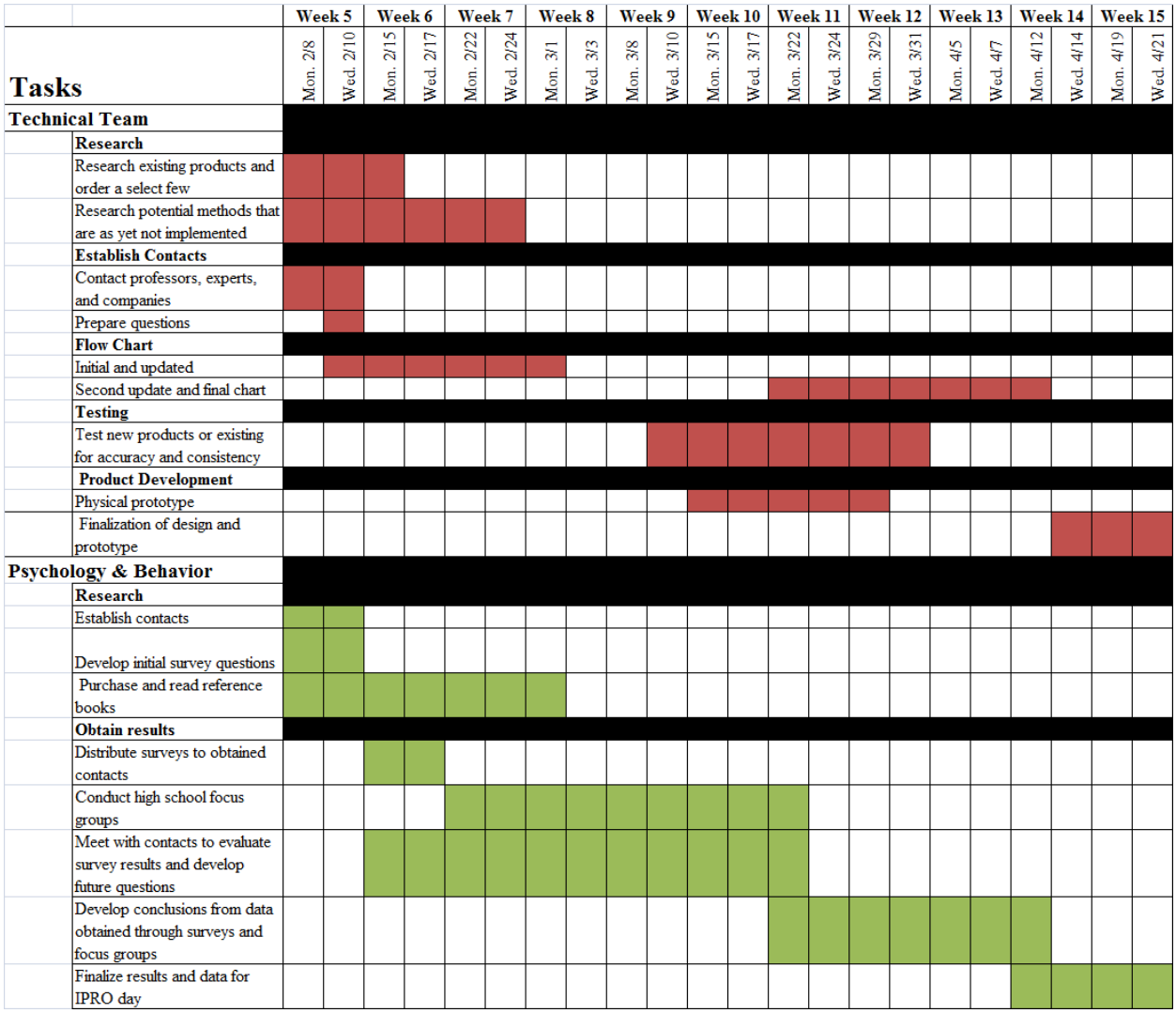
As a team IPRO 351 decided on two major areas of attention. Two sub-teams were developed through discussion, a product development and psychological team. The team focusing on product development was broken into sub-teams for specified areas of attention. Within this team there is a section dedicated to chemical technology research and one that will focus on less invasive and possibly pre-existing simple methods for alcohol detection. The psychological and behavioral factors team will be examining why drunk driving is an issue when there are systems in place that have been designed with the intention of curbing it. This team will be looking into why these efforts have and do not work, and look further into what can be found to have a higher possibility of being effective.

Team Structure



A breakdown of the team's designated tasks is shown below in the form of a Gantt chart. This shows the developed timeline and tasks created by each sub-team for their respective work, which will be compiled together continuously throughout the semester for a cohesive final presentation at IPRO day.

IPRO 351 Tasks & Timelines



6. Expected Results

Alcometre intends to understand the existing problem thoroughly by collecting information from already established organizations with shared concerns, companies with similar products, and through our own focus studies of the chosen demographic of parents of minors and the minors themselves. From this information we aim to develop a product concept that would offer the most benefit in the least invasive form, both physically and informatively.

We will buy and test the current BAC measuring devices to see how accurate currently available models are, and if they could be adapted to our needs and fit into an ignition interlock system. The field research will result in the significant statistics to show the scope of the problem at hand, and to show which approaches have not worked in the past, as well as quotes from expert opinions on what we are trying to accomplish.

From this exploration, the product that we currently see forming is a minimally invasive device that will be either able to detect the BAC level or mental functionality of the driver of the vehicle, and if a BAC other than 0 is detected, or their reflexes do not meet requirements, their ignition will not turn over the engine and start the car.

Alcometre will have a significant amount of survey and focus group data to present, as well as survey and focus group data already attained by groups like D.A.R.E. and M.A.D.D. While we will have a goal of exactly how the product should look and function, we expect to have compartmentalized mockups of several stages of the process to support our visual representation.

We foresee one challenge to be patents on existing technology affecting the cost of our product greatly. We are also concerned on discovering the legalities involved if a minor tests above 0% BAC, and what responsibility does that information give the company, the parents, and the state.

7. Project Budget

Item	Cost
Existing Technology	$200
Materials for IPRO Day	$20
Survey Monkey subscription	$60
Survey Incentives	$200
Reference Materials	$50
Travel and Meeting Fees	$70
Total Budget:	$600

8. Designation of Roles

Role	Name
Minute Taker	Phaedra Howe
Agenda Maker	Stephanie Salem
Time Keeper	Briana Macon
iGroups Moderator	Faye Garfinkle