IPRO 351:
Combating Underage Drinking and Driving

Project Plan

Members: Melene Hajakian, Vincent Cartabiano, Rawan Abbasi, Stephanie Salem, Briana Macon, Stuart Graham, Edinam Kurenty, Mikayla Mazur, Sandra Menezes, Kimberly Nealy, Jared Svaldi, Alex Szalko, & Claire Wong

Advisor: Jim Braband

I. TEAM CHARTER

1. Team Information

A. Team member roster (name, contact info)

Team Member	Major	Phone Number	E-mail
Rawan Abbasi	Biomedical Engineering	[redacted]	rabbasi1@iit.edu
Vincent Cartabiano	Biomedical Engineering	[redacted]	vcartabi@iit.edu
Stuart Graham	Electrical Engineering	[redacted]	sgraham4@iit.edu
Melené Hajakian	Biomedical Engineering	[redacted]	mhajakia@iit.edu
Edinam Kurenty	Mechanical Engineering	[redacted]	ekurenty@iit.edu
Briana Macon	Business Administration	[redacted]	bmacon@iit.edu
Mikayla Mazur	Biological, Chemical and Physical Sciences		mmazur@iit.edu
Sandra Menezes	Chemistry (Focus on Education)	[redacted]	smenezes@iit.edu
Kimberly Nealy	Professional and Technical Communication	[redacted]	knealy@iit.edu
Stephanie Salem	Business Administration	[redacted]	ssalem@iit.edu
Jared Svaldi	Mechanical, Materials, and Aerospace Engineering	[redacted]	jsvaldi@iit.edu

Alex Szalko	Business Administration	[redacted]	aszalco@iit.edu
Claire Wong	Applied Mathematics	[redacted]	cwong8@iit.edu

B. Team member strengths, needs and expectations

Team Member	Strengths	Needs	Expectations
Rawan Abbasi	Organized, meets deadlines, reliable, listens to others, flexible and communicates	Team members should: complete given tasks, be open-minded, work together, participate, cooperate, be respectful, creative, enthusiasm and ask questions	To win 1st place on IPRO day!
Vincent Cartabiano	Business experience, proficient at basic website design and computer programming (MATLAB, C++, VB.NET), good at working in a team setting and has product development experience	A team with members that complete assigned tasks in a timely manner, are effective communicators, and are open-minded and creative.	Hopes that the team will be able to develop a functional prototype that effectively demonstrates proof of concept
Stuart Graham	Analyzing data, rational thinking, excitement, willing to work extra hard in group setting.	Would like to improve organizational and scheduling skills	As a bare minimum, getting some pseudocode to the Knapp Lab to begin/finish work on our i-phone app
Melené Hajakian	Experience with small businesses, interest in product development ,	Need the team to work together as a team but also be	To develop a working prototype by the end of the

	know how to handle conflicts, considerate and have good sources to network	able to depend on people to finish specific tasks assigned to them	semester and impress judges on IPRO day
Edinam Kurenty	Creative, agreeable, works well in teams, flexible, resourceful, good at multitasking, detail oriented, has a good work ethic	A cooperative, considerate, hardworking team; as well as effective communication between subgroups	To gain "real world" experience and skills, acquire knowledge from unfamiliar fields
Briana Macon	Research and writing skills and great task management	Increase public speaking skills	Do more market research, develop at least one of these iPhone applications and find ways to test these iPhone applications
Mikayla Mazur	Respectful, provides constructive criticism and helpful suggestions, flexible in team setting	Need members to listen, provide feedback and be respectful to all other members.	Expect all members to get along and reach our goal. Also, to make progress from last semesters work and offer unique insight
Sandra Menezes	Organized, a list maker, punctual/dedicated, follow through on given tasks, do not procrastinate and do not like being late!	Need experience with surveying people (online and in person) and IRB certification to survey human subjects	To be able to see a working prototype or a clear view of the next steps for our product
Kimberly Nealy	Integrity, people oriented, writing and editing, strong desire to learn, improve	Details, specifics, and requirements from members – I need to know what	To learn and grow from others and to place in the top 3 or win 1st place.

	professional skills and thought processes, productive, good time management skills, organized, resourceful and detail oriented. Experience in MS Word, PowerPoint, Access, Excel, Adobe InDesign, and Photoshop	is expected of me; I don't like to make assumptions.	
Stephanie Salem	Learner, achiever, activator, arranger and relator	Flexibility because I am in season for soccer. This will require me being proactive and efficient to complete all necessary work.	1st place at IPRO day this semester!
Jared Svaldi	Word Processing, thorough, leader, organized and studious	Flexibility with soccer schedule, structured set of goals and expectations, team communication and cooperation	To have a feasible idea and possible prototype by semester's end and to finish at least top 2 in our track
Alex Szalko	Strong interest in Psychology, diligent, public speaking and marketing	Structure / Organization, cooperation and enthusiasm	Efficiency, fast communication, members pulling own weight and see all necessary research done by the end of the semester
Claire Wong	Delegates tasks, keeps track of deadlines, organized, detailed, good verbal communication and public speaking,	Team members to be respectful, communicate, listen, considerate and productive in meetings during	To learn more preventative measures against drinking and driving, to put a product to market

	analytical mind, math and science background, ability to teach/tutor others, great work ethic and works well in groups and individually	and outside of class. Need effective team leaders/sub-team leaders and an involved professor	and to win IPRO day

2. Team Purpose and Objectives

A. The team purpose is to combat underage drinking and driving

B.

Application/Testing Design:

- To develop i-phone applications

New/Existing Tech:

- Develop a comparable device that will be competitive in the market

Behavior and Survey:

- Gather data to find out what people want (validation) or would be interested in --- our target market

Finance/Marketing:

- Compile details/info to create a business plan – opportunity assessment

3. Background

IPRO-351 is a student-designed IPRO and is currently in its third semester of existence. The main goal of the project is to combat drinking and driving. The first semester focused on developing a device that uses infrared technology. Through their research, they found extensive patents that halted the progress of their work. The second semester team decided to take a creative approach in preventing drinking and driving, specifically underage drinking and driving. The team looked at the key functions that are impaired when intoxicated: cognition, eye movement, and dexterity. They created a series of iPhone application tests that would measure these impairments:

The first challenge is a math game that displays a basic arithmetic problem with a collection of answers. The game is scored on how many problems are answered in a given time, and the accuracy of the answers. This challenge tests the users cognitive functioning level, and would be pass/fail depending on the deviation from the normal score.

Next, a game consisting of a word marquee involves a scrolling word and then asks the user to enter the word that just moved across the screen. The user must enter the word correctly. This challenge requires the user's vision to be unimpaired and they must have the coordination the type in the word correctly.

The third game requires the user to navigate through a series of obstacles. For this test, the user's dexterity and reflexes would need to be free of impairment. This challenge would rate the user on how many obstacles were avoided as compared to normal completion. When the apps are used, all three challenges must be completed, and all three must be passed. If any

challenges are failed, a text message will be automatically sent to one or both parents, at which point they would get involved in the situation and contact their child to organize how to get their child home safely.

If the problem of the child drinking and driving becomes more dangerous and the parents want to take further precautions, the applications could easily integrate into motor vehicle remote access systems. The company Connect2Car offers a setup that allows the cars engine, lights, horn, location, and locks to be monitored and controlled via SMS or the Internet interface. This system works readily with cell phones and would be programmable within the presented application suite.

The main ethical issues that exist are the liabilities in whether our tests will be able to detect and prevent an individual from drinking and driving. Before this product can be launched, the IPRO-351 team will need to conduct extensive research and testing to assess its reliability and validity.

The societal costs are obvious; however, here is a list of statistics to support our focus on underage drinkers: The issue of teenagers drinking has seen a significant increase over the past ten years. 75% of seniors in high school say they have consumed alcohol. In addition to this, 60% of juniors and seniors say they have ridden with an intoxicated teen driver. Out of 5,000 teenage driving deaths, drinking and driving cause 1,900. This is a major concern. Often times parents do not know their children are drinking and driving, let alone drinking at all. 48% of the teens who have drank in the past year were said to be 'nondrinkers' by their parents. Benefits of the product include the appeal and ease of acceptance into society. Most teenagers and their parents are familiar with the existence of smart phones, and 62% of teenagers already own and use a cellular phone. Due to an application's ease of use and commercial availability, the product would be easily attainable for the targeted voluntary market. This ease of adoption would help the product quickly integrate into the lives of the consumer. Having a cellular phone based system allows for parents to easily communicate with their child regardless of the child's location. The system being developed by EnPRO 351 allows the child freedom without decreasing the parental involvement. The cellular phone approach allows for discrete use of the product, unlike a breathalyzer or transdermal detection unit, increasingly the likelihood of adoption.

Having the system detect indirectly also alleviates the legal obligation of the parent and child to report the illegal activity of underage drinking. This allows the parents and child to develop their own approach to the problem and does not add the financial strain of a lawsuit to the situation. This encourages the parties involved to focus on the parent child relationship in order to promote a long-term change in behavior.

The team looked into several approaches for alcohol detection, and considered many factors including cost, ease of use, acceptance, and detection. The most commonly accepted method involved in alcohol detection currently is breathalyzers that function with an ignition interlock system. This system is expensive, stigmatized, unsanitary, and does not communicate with offsite systems. The team wants to promote parent child communication in a discrete and cost effective way.

Google offers a service to prevent email communication while intoxicated based on a series of math problems. The team agreed that this approach allows for creative programming, simple integration into the parent and child's daily routine, and involves minimal maintenance.

The Google approach is not available currently on any mobile device. The team is using this basis to develop a series of mental challenges that will communicate with the car and with the parents.

The team focused in on developing an application of Apple's iPhone because the ease of programming, resources available, and the popularity of the device. The Connect2Car system that would be installed in the vehicle can communicate with SDK applications, same as the iPhone. The application, once developed, would be easily translated to a multitude of cellular phone operating systems.

The most critical part of Fall 2010 will be testing the validity of our iPhone applications. Based on research, we found the key impaired functions while intoxicated and developed tests to measure them. People will have different levels of impairment and we need to conduct research to make sure the applications are reliable in measuring impairment.

The applications are still in the idea phase so another goal is to have them developed as a prototype minimally. We can have them developed through a professional or students at the IIT KnappLab. With this, we also need to consider intellectual property and make sure no one can steal our idea and develop the applications themselves.

Surveys and focus groups will be another critical component, especially once the apps are developed. We need to see whether people would be interested in our products and figure out what they specifically want to see in them. Determining proper pricing and marketing techniques will also be critical.

4. Team Values Statement

` A.

-Integrity
-Fidelity
-Corporate Citizenship
- Diligence
- Time Awareness

- Team members should attend all required meetings on time and prepared to get down to business, address conflicts as they arise, share pertinent information with team members, keep the lines of communication open., e.g., via iit email, Google Docs, and/or cell phone.
- Accountability and Timeliness (Class attendance, arriving to class on time, turning in assignments before the deadline, admitting mistakes)
- Teamwork (each success and failure belongs to the whole team, celebrate when something great happens and pick others up when something negative happens, we are all in it together)
- Assertiveness (openly stating things in a way that conveys your opinions, yet does so in a manner that is not forceful or passive)
- Openness and Innovation (be willing to think openly and innovatively no matter how crazy an idea may be, on the other end: make sure you do not criticize others thoughts or ideas)

- Dedication (the overall effort each individual puts into the project, work outside of the classroom should be done in order to move our project forward, people should willingly volunteer to take part in the work)

B.

- Problems: concerns should be brought to the attention of the team leader or sub-team leader directly. Solutions to problems should be shared with the entire team when required. Sub-groups may find Google Docs useful for sharing working files, new ideas, and/or any problems with deliverables and deadlines.
- Conflict should be first discussed between the people that have the issue. If this cannot be done, Mikayla, our team's conflict manager should take part to help solve the issue. Last case scenario would be Professor Braband getting involved and helping sort things out.
- For issues pertaining to the course work, we should first try to address it through e-mails. If it is a situation that cannot be addressed through e-mailing, we will set up a time that works for everyone to meet outside of class.

II. PROJECT METHODOLOGY

1. Work Breakdown Structure

A. Solving the Problem of Drinking and Driving

a. Behavior and Survey Team
   i. Determine the certification needed for surveying human subjects and become certified.
   ii. Get all 10 families together from class (total of 130 families)
   iii. Determine the certification needed for surveying human subjects and become certified.
   iv. Design an effective survey for parents and a survey for students in high school
   v. Contact families to get feedback from parents and students.
   vi. Compile the data and organize it
   vii. Come to conclusions on the desire of the App.

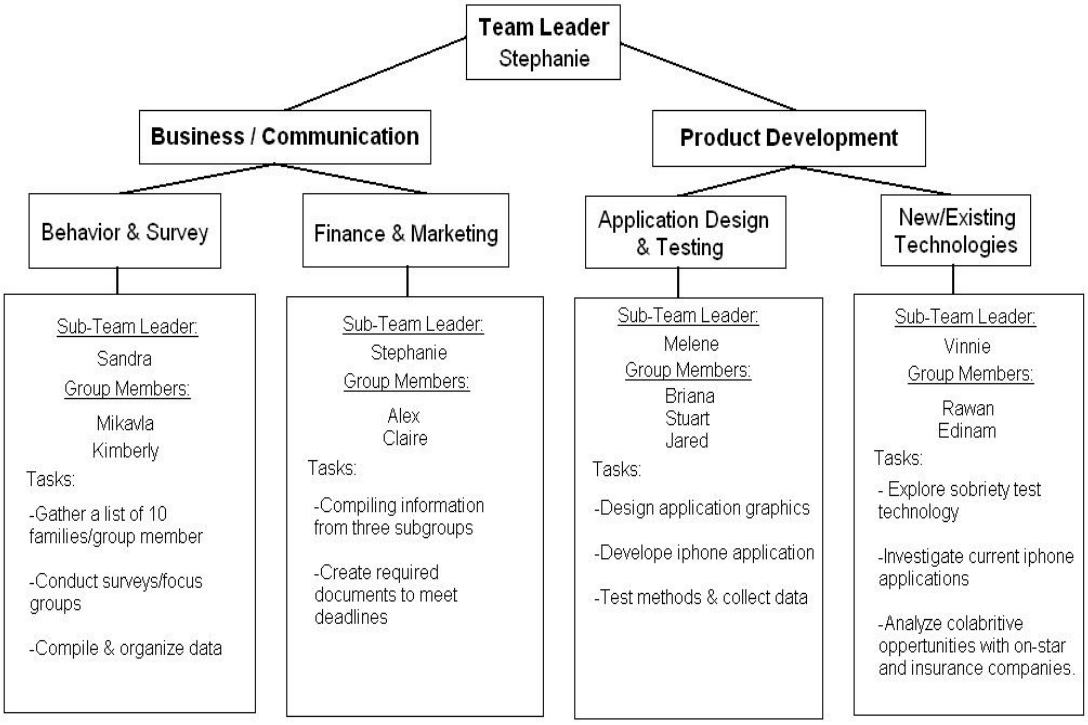
b. Application Design and Testing Team
   i. Write a pseudo code for the Applications
   ii. Design graphics for the Applications
   iii. Determine games to model from
   iv. Research applications that already out that test key impairments
   v. Determine other games we are interested and developing
   vi. Speak with the Knapp Center in the Stuart School of Business about developing or applications
   vii. Speak with IIT colleagues regarding cost and developing for them develop the applications

viii. Research professionals who could potentially develop the applications and gain quotes.
ix. Propose all applications and designs to all potential sources
x. Research ways to determine pass/fail results
xi. Research testing methods and ways to accurately perform and read these test.
xii. Conduct testing.

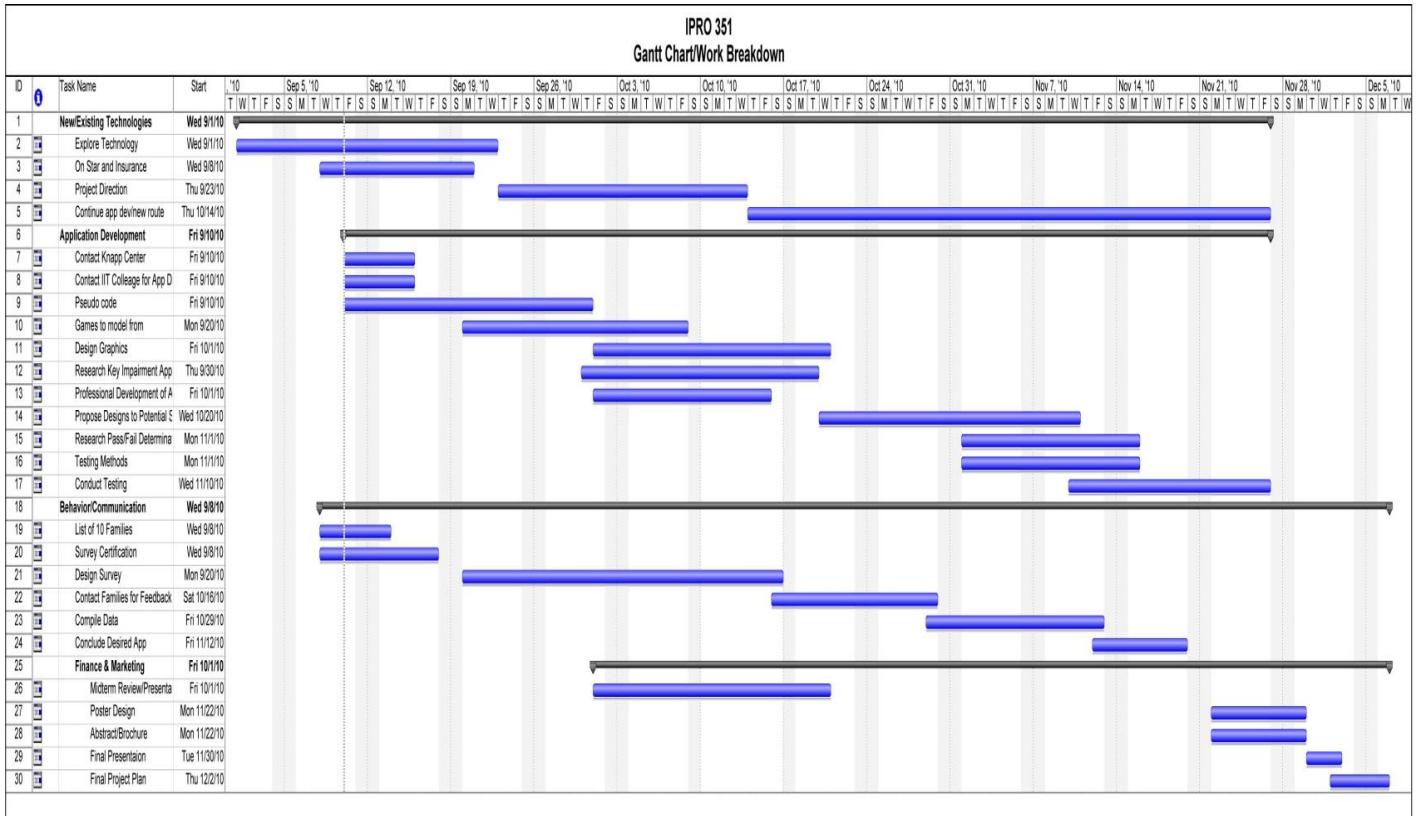
c. New and Existing Technologies Team
   i. Research current products on the market to prevent or monitor drinking and driving
   ii. Research new technologies not used in the scope of drinking and driving
   iii. Think of ways to incorporate current technologies into a product
   iv. Find statistics on costs and average savings of the current products on the market versus our new product

d. Finance and Marketing Team
   i. Document all expenditures to make sure the team stays within the budget
   ii. Keep track of deadlines and complete deliverables

B. Team Structure



C. Work breakdown structure or Gannt Chart



2. Expected Results

The overall mission of IPRO 351 (as stated above) is to combat underage drinking and driving. A number of different methods of accomplishing our mission have been discussed at the group level some showing more promise than others. In order to determine which method will most effectively serve the community's needs, we must accrue a substantial amount of research from many different fields of study to assess the market and produce a working prototype.

That being said, each subgroup has compiled a list of expected results for the upcoming semester that will lead us to complete our desired objective of gauging the market for our solution to underage drinking and driving.

Application Development Subgroup

Expected activities include determining the process necessary to develop the prototype, writing the program, and testing / debugging the final result.

Expected data from research and testing phase include finding a programmer to make the application, feedback and data on how effective the app is, and a plan to rework the application after the first trial.

Through research and testing, the app will be made and changed as results develop. In order to accurately define how well an “impaired” test taker may perform on our supplied tests, many trials will need to be done with sober subjects to determine a “sober standard”.

Potential output for application development subgroup includes a working prototype and supplemental testing data to be used to rework the prototype for future IPRO groups.

The first potential hurdle in the research process is determining the overall function of the application and what purpose it will ultimately serve (should the application be a deterrent for a drunk driving or provide an intervening action to the vehicle itself?). The next foreseeable difficulty is how the sobriety tests will be designed and the program code for the application itself. When researching the design of a sobriety test, legal implications will be considered as a faulty or inaccurate test could considerably effect the reputation and effectiveness of the service. Finally, to avoid patent infringements, extensive research on competing programs will be completed.

The working prototype will be as close to the solution as IPRO 351 has come since its conception. With contributions from the three subgroups, the application will embody the entire efforts of the group.

Behavioral / Survey Subgroup

The Behavioral / Surveying Subgroup’s expected results for the semester are wholly concerned with accruing market research on potential customers for our final application and how the application development group can write a valid sobriety test.

Finance / Marketing Subgroup

The Finance/Marketing team’s expected results by the end of the semester include serving as managers for the other three groups as well as delivering a detailed business plan proposal. By serving as managers on the other subgroup teams, they will have an excellent understanding of the methodologies and mentality of the IPRO, which they strive to reflect in the final business plan. This will include developing the key work breakdown areas (go to market strategy, financials, business model). Essentially, the Finance / Marketing team will summarize the entire effort of the semester.

The main challenges and risks associated with the Finance/Marketing team lie in the ability for the whole team to be able to be creative, innovative, and provide detailed research. Unless we can solidify an idea for a new product that will combat underage drinking and driving, we cannot actually complete a business plan proposal. Additionally, we will need to make sure we understand findings from the other subgroups at a detailed level, and then bring it up to a high level so it can be understood by all and incorporated into the business plan.

3. Project Budget

Item	Justification	Amount
Application Development	15 hours @ $20/hour	$300
Testing	Incentive for volunteers	$100
Survey/Focus Groups	Incentive for volunteers	$100
Breathalyzer	Disposable (up to $3) Reuseable (up to $150)	$100
Materials	Printing, project poster & other materials	$50
Transportation	Used to buy materials/conduct surveys and focus groups	$50
	Total	**$700**

4. Designation of Roles

A.

- Team Leader- Stephanie Salem
- Deadline Manager- Rawan Abbasi
- Minute Taker- Kim Nealy
- Time Keeper- Briana Macon
- iGroups Modifier- Vinnie Cartabiano
- Conflict Manager- Mikayla Mazur