

I PRO 308
Project infoMoto
Summer 2011



Facility Advisor: Alon Friedman, Information Technology






Management Program, School of Applied Technology

I. TEAM CHARTER

1. Team Information

A. Team member roster/skills and expectations

| Member Name | Talents | Skills I'd like to develop | Project expectations | Email | Phone # |
|-----------------|--|---|--|------------------|---|
| Faraz Hussain | <p>Elementary C++ programming</p> <p>Familiarity with iOS platform, jailbreaking, etc.</p> <p>Understanding of common frustrations with motorbikes and experience with two-wheelers</p> <p>Salesmanship</p> | <p>Become a safer, more proficient motorcycle rider, and be able to encourage others to do the same.</p> <p>Ability to code for a variety of platforms-- particularly the one on which we choose to run our device</p> <p>Learn how to infiltrate motorcycle clubs</p> | <p>Lay the groundwork for eventual production of device</p> <p>Make motorbikes safer and more enjoyable for riders</p> <p>Enjoy the IPRO team experience and win on IPRO Day!!</p> | hussfar@iit.edu |  |
| Corey Sarsfield | <p>C/C++ Programming</p> <p>Java Programming</p> <p>Experience with coding hardware interactive software</p> <p>Some databases experience</p> | <p>Develop better skills in this specific area.</p> | | csarsfie@iit.edu | |
| Haochen Wang | <p>Some knowledge in Combustion Engine/Statics/Dynamics/Java Programming</p> <p>Can use following Software: AutoCAD Microsoft Word/PowerPoint/Excel Photoshop</p> <p>Good communication skills, excellence in gathering information online</p> | <p>I will contribute my skills and knowledge, in order to achieve the success of this project. I will do my best as an Agenda maker, which will keep tasks on track and on time.</p> <p>Through the project, I want to improve my skills in team cooperation, presentation and critical thinking.</p> | <p>By the end of the summer session, we could gather enough information for building an ideal prototype, and hopefully getting a sponsor, which is helpful enough for the fall session team to build a mature, and complete version of infoMoto.</p> | hwang34@iit.edu |  |

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|-------------|---|--|---|------------------|---|
| Jeff Perkis | 20+ years in the motorcycle community and basic mechanical knowledge of motorcycle and engine work/repair 15+ years of management experience Knowledge of CADD and various other 3D and drafting software | I would like to further develop my understanding of current technologies and software available. | Develop an idea that will eventually become a physical product desired by motorcycle manufacturers. | jperkis@iit.edu | |
| Joe Charles | Experience working on team based projects Basic mechanical knowledge | I would like to continue building my professional/team project experience. Motorcycle riding and maintenance skills | Contacting and becoming involved with the motorcycle community | jcharle1@iit.edu |  |
| Arun Siva | Public Speaking Experience with mechanical components and systems in motorized vehicles | | | asiva@iit.edu | |

B. Team Identity

Our team will be known as team infoMoto, pending copyright and domain name issues. At this time a team logo and slogan have not been decided upon. As the semester advances, these will be developed to fulfill the team purpose and vision.

2. Team Purpose and Objectives

A. Team purpose

Team infoMoto will adhere to the following innovation intent:

infoMoto is a user-friendly and affordable aftermarket device which provides accessible feedback to the rider and mechanic as to the safety and performance of the motorcycle, which enhances the overall riding experience. Unlike existing standard equipment which provides minimal information, infoMoto notifies the user of impending malfunctions in addition to providing diagnostic information. This device may also help the designers of future models of motorcycles to head off any impeding problems, increasing the quality of their product.

This innovation intent will evolve to reflect the team's development as the semester progresses.

B. Set Objectives

Team infoMoto will strive to meet or exceed the following objectives:

- Research existing and potentially new components to incorporate into our device
- Collaborate with the wider motorcycle community including riders dealers, repair shops, and motorcycle instructors
- Put up a website, including a forum/discussion board: explore existing online communities and evaluate their suitability for our purposes
- Build a solid foundation for the continuation of the project during the fall semester

3. Background

A. Customer Info

As of 2007, the National Highway Traffic Safety Association reported over 7 million registered motorcycles, a number which continues to grow steadily every year. These 7 million motorcyclists make up an extremely diverse community which includes many sub-cultures; leisure riders, commuters, track racers, etc. These subcultures differ in many ways but they all share a commonality; the joy of motorcycling.

Motorcycling provides a unique experience, allowing the rider to enjoy being on the road without the confines of a steel cage. It requires the full focus of the rider and gives a sense of freedom many may not find in their sedans and minivans. The motorcycle is not just a form of transportation, but a way of life.

B. Problem

Currently, just as seen in automobiles, there is a large variance of technology available on motorcycles. Some of the higher end motorcycles have computers and controllers that control the operation of the motorcycle and collect information while lower end motorcycles have little to no computer technology. Motorcyclists and technicians each have access to partial information about the performance of the motorcycle. The information that is available to the rider is very limited and often not easily accessible due to the dashboard user interface. The proposed system would download information from the motorcycle in two modes, one for the motorcyclist and one for the technician and with the owner's consent provide data to the manufacturer.

C. Current Technology

Current technology already allows for the specific riding data intended for users of the infoMoto, such as tire pressure, tire temperature, etc. However, it is generally expensive and is only available from certain high-end manufacturers or for precision race and track riding. There is also not an inexpensive product which gives access to all of these parameters.

D. Previous Solutions

Some of the tech we're considering has already been successfully implemented by a few bike manufacturers, but we intend to bring it to the mainstream consumer. Other tech is available in cars but not motorcycles.

E. Ethical Issues

One feature of the device in consideration is to have data collected from a rider sent directly to the manufacturer for product development purposes. Another consideration is that the data could be accessible through online sources. These features bring to light privacy issues. Developing a data portal which ensures privacy would be essential.

Another issue raised by providing such data is safety. One of the existing purposes in collecting performance data is to improve lap times; in other words to go faster. It is unavoidable that people will sometimes ignore speed regulations. Is it ethical to provide a device which may tempt users to push their motorcycle to the limit, therefore breaking the law and possibly injuring their self? These and other unrealized ethical issues must be considered throughout the development of the infoMoto device.

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F. Societal/Business Costs

Since current rider performance data is not easily accessible or inexpensive, many motorcyclists may not be aware of poor safety or riding performance. This remains an issue as

motorcycle accidents have much graver outcomes than typical automobile ones. An automobile driver involved in an accident has more protection than a motorcyclist; seatbelts, airbags, a steel frame surrounding them. A motorcyclist has only protective gear such as pads and a helmet and is much more likely to be seriously injured or killed by a collision. By providing data which may improve safety and riding skill, accident and injuries can be avoided.

The infoMoto device will also indicate when an impending equipment failure will occur. This will enable motorcycle owners to replace worn brakes, fill tires and other maintenance requirements, further lessening the likely hood of accidents. This feature will also help improve the lifespan of a motorcycle and decrease costs for the owner. A properly maintained bike will run better and will require less repair costs.

The infoMoto will not only improve the quality of the motorcycle experience for riders, but will also be extremely lucrative for the manufacturer of motorcycles. Providing the information collected to manufacturers will enable them to diagnose and improve their products. Manufacturers would be able to evolve their manufacturing processes to help bring about the next generation of safer, more efficient and user-friendly motorcycles as well as assistance devices. The system will also give manufacturers an edge in the industry by tapping into an under-utilized user interaction.

G. Proposed Implementation Outline

After testing several components and deciding which functions will be most appropriate to monitor, we will put together a detailed proposal of what our product will do and how it will add safety and enhance the experience for the rider. Our product will provide critical data for the technicians performing maintenance on the motorcycle as well as provide valuable feedback to the designers as to heading off any critical issues which may be addressed during the design phase.

4. Team Values Statement

A. Desired Behavior

The team agrees to follow these basic rules:

- Team members will be respectful and courteous to each other as well as anyone involved with the project
- Team members will be punctual and responsible for their own work
- Any issues will be resolved firstly by agreement and if necessary by moderation

II. PROJECT METHODOLOGY

1. Work Breakdown Structure

A. Solution Strategy

The major goals for this first semester include:

- Research what we're doing and decide on scope of product
- Identify potential users, vendors and compatible bikes
- Contact motorcycling community and determine user needs
- Find sponsor(s) [bike manufacturer/accessory maker] and understand their requirements
- Collect and assemble parts
- Initial field testing
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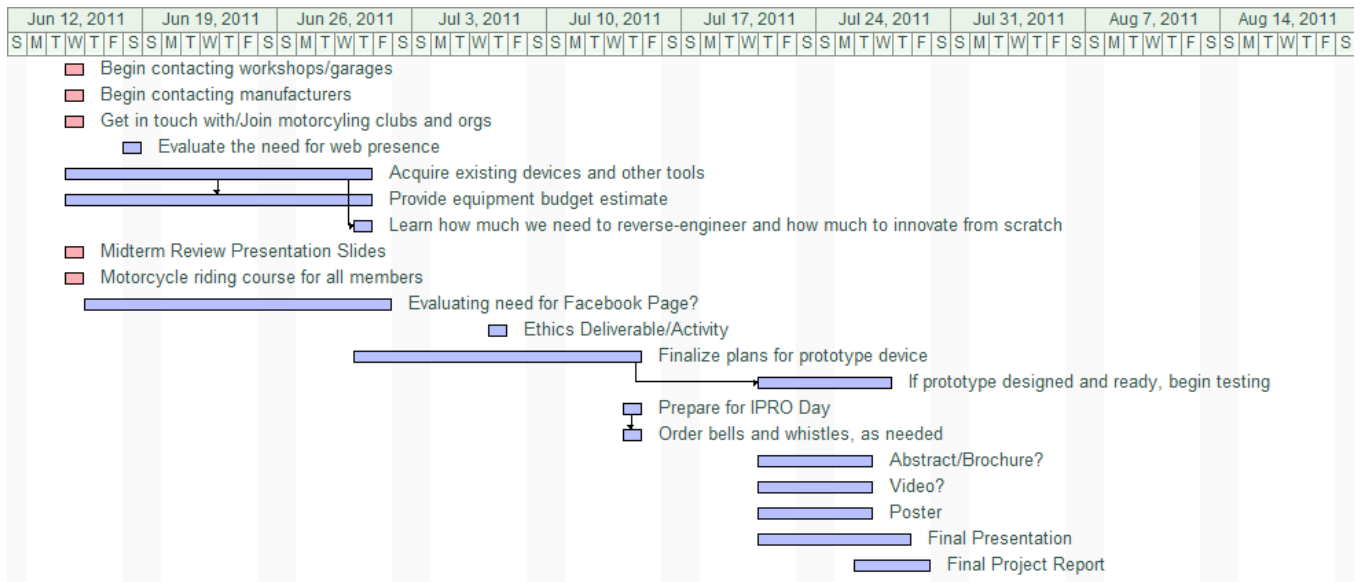
Solutions will be developed with the collaboration of the motorcycling community at large. Data collected from the community will be compiled and analyzed, possibly with the help of an online database which riders can access directly. Once the needs and wants of the community have been assessed, more in depth work on a prototype may begin including sponsorship and hardware research.

The project will also involve some initial field work; obtaining some test sensors to begin assessing the feasibility of a prototype. This work will most likely be very informal and also serves to give the team more experience with actual motorcycles.

B. Team Structure

We have chosen to divide into fluid teams as the task demands. Our group is small enough to work as a whole, and sub-divide to handle smaller tasks as needed. With only 7 members on the team, we expect few issues involving organizing and assigning tasks. Everyone is able to contact and interact directly with every other member.

C. Team Schedule



2. Expected Results

A. Expected Activities

Team infoMoto expects to participate in the following activities during the semester:

- Learning to ride motorbikes
- Spending time with other riders and gathering information and opinions
- Researching offerings of manufacturers and accessory makers
- Canvassing potential sponsors
- Completing deliverables for IPRO office

B. Expected Data

The following data will be collected from the motorcycle community:

- Common issues
- What riders want to see in a product
- What prices they are willing to pay for a product
- How the community and it's sub-cultures interact and behave
- What is required to obtain sponsorship
- What brands and manufacturers are preferred

As well as field data from some these possible candidates:

- Tire temp & alarm
- Brake life

- O2 sensor
- Time line for engine efficiency
- Malfunctioning lights
- App providing interface
- Fluid levels
- Vibration measure
- Speed vs. fuel consumption
- Evaluate cornering / riding techniques
- Tracking lifetime of starter
- Emissions
- Gear shifting RPM
- Tire traction
- Vehicle tracking position
- Weather radar
- Shocks—stress and strain

These datum candidates are subject to change throughout the semester.

C. Potential Resulting Products

Team infoMoto foresees some of the following products resulting from this semester's research and testing:

- A user-friendly website designed to enable riders to upload their data
- A database comprised of user data that is accessible by the community and by the research team
- A sponsorship from an interested manufacturer or other group
- A basic prototype of the infoMoto device

D. Task Outputs

The team's project tasks will provide the following:

- Learning to ride motorbikes will give insight to the motorcycle community and allow better connections to it
- Spending time with other riders and gathering information and opinions will provide more insight to common problems and wants
- Researching offerings of manufacturers and accessory makers will reveal what hardware and current technology is available to the team
- Canvassing potential sponsors will allow for design of a project proposal
- Completing deliverables for IPRO office will ensure the continuation of the project next semester

E. Expected Deliverables

This semester's work will result in the following deliverables:

- A data analysis of motorcyclist wants and issues
- Analysis of current technology and hardware
- Sponsorship details
- A basic prototype and feasibility report
- A comprehensive report detailing all the semester's findings

F. Challenges, Risks, Assumptions

Team infoMoto predicts the following challenges:

- Connecting with the motorcycle community
- Finding enough rider participants
- Gathering enough information in the limited time we have
- The usual organizational and teamwork issues

As well as the following risks:

- A biased rider response; not collecting a broad enough sample

There is little more risk involved in the project due to its early developmental stage.

3. Project Budget

| Item type | Cost (\$) | Description |
|--|-----------|--|
| *Bike tools (some may be borrowed from SAE garage) | 400 | Specialized tools which are not commonly available may be required |
| Trips to biker events | 500 | For research purposes |
| *Cost of components & prototyping | 1500 | Components include sensors, gauges, indicator lights and mounting hardware |
| Software | 300 | Apps already available and software to communicate with hardware |
| IPro Day | 700 | |
| TOTAL | 3400 | |
| | | |
| * Costs may change | | |

4. Designation of Roles

Minute Taker: records decisions made during meetings, including task assignments or changes under consideration. -Jeff Perkis

Agenda Maker: creates an agenda for each team meeting, which provides structure to the meetings and offers a productive environment. -Haochen Wang

Time Keeper: is responsible for making sure meetings go according to the agenda. -Arun Siva

iGroups Moderator: responsible for organizing the team's iGroups account and ensuring that it is updated regularly. -Faraz Hussain