

Needs Analysis

Needs and Requirements

The team's overall objective is to have a functioning device that gathers more precise data from sprinters as they run (stride length, stride rate, stride frequency, acceleration, top speed, etc). Because of this we will be collaborating with the FSU track and field coach and the FAMU-FSU College of Engineering. In our early-most stage, there was a meeting with our sponsors, who are Michael Ormsbee and Bob Hickner, both pointing out the need of a technology that obtains at least the stride length for each stride. In addition to this, we were given a wide-range of possibilities regarding how to go about collecting the data, leaving it up to us to determine what would be the best method for data collection in relation to the environment the runners will be in.

The idea of a camera was put into question, with ability to catch the motion of the runner and pause frame by frame in order to calculate measurements seemed plausible. However, when discussing it with our advisor and sponsors it seems the primary issue is the limited range a camera can capture of the runner. Also, if the camera were to be utilized it would require the ability to capture different body types, variables regarding the runner's physique.

Another prospect was the utilization of sensors at certain points of the runner that take the proximity, point of where the sensor is located in relation to time, resulting in getting real-time data regarding positioning of the sensor. This would result in useful data points that can then be interpreted by a software that takes in sensor data and as a team create code that establishes this data into usable information for the runner.

These ideas are derived from the original project scope, as based off our sponsor meeting it was decided that our team had a range of possibilities for this project. When it came to brainstorming our team took the customer needs and looked at what could be most beneficial for the consumer, and at the same time prove to be cost effective.

Interview Question

Number	Question
1	What data is vital information to know about the sprinters?
2	What do we need from sprinter to collect data?
3	What are some of the elements we should be aware of considering our hardware?
4	How could the training experience be enhanced between the coach and runner?

5	Is there an estimated budget?
6	What are some features that you feel are necessary?

Needs/Customer Statements

Need Number	Question Number	Customer Statement	Interpreted Need
1	1	Acceleration through different segments of the run as well as stride length and frequency.	Giving the user data regarding stride length, stride frequency, acceleration, and top speed.
2	2	It would be useful to know the height and weight of the runner.	A program that allows the runner to input their height and weight.
3	3	When training and competing runners sweat a lot and sometimes get dirty when stretching.	A device that is water/dirt resistant.
4	4	Sometimes it is hard to get information to the runner about performance. Maybe a phone application would be useful.	Creating an application or device that allows easy input and output of the data.
5	5	Well we want something more affordable because some of the equipment like the 1080 motion machine costs around \$20,000.	A device that is affordable for even some high schools to purchase. Less than about \$5,000.
6	6	We think it's important that if there is anything worn by the runners that it should be very light and able to stay	Use hardware that is lightweight and will stay attached to the runner during sprints.

		attached during rigorous movement.	
7	-	-	The device needs to be accurate, efficient, and user-friendly

Requirements

Requirement Number	Need number	Requirement
1	1,4	Have outputs displayed on a screen
2	2,4	Allow user input
3	6	Less than 4 oz.
4	3	Waterproof
5	7	<u>Portable</u> base by starting block that connects to sensors

Constraints

Number	Constraints
1	Budget
2	NCAA regulations
3	Time