

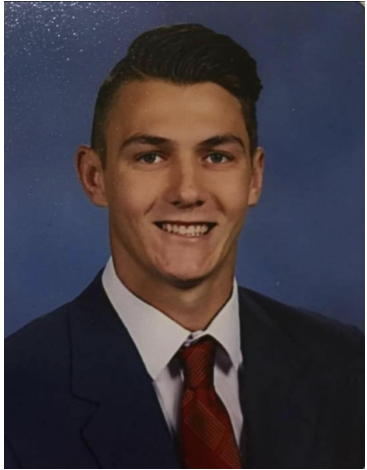


FAMU-FSU
College of Engineering

Team 309: Sprinter Data Collection



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FSU Athletics

Sponsors:

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Motivation

- To improve the performance of the sprinter
- Solution - To create an affordable device that can help coaches analyze sprinter data



Project Background

- Sprinting: running over a short distance in a limited period of time.
- Sprinter performance is influenced by multiple factors such as:



→ Start Technique

→ weight, height, speed, force



→ Stride Length



→ Stride Frequency

- To better understand the performance characteristics of the athlete, high technology data collection devices are being implemented.

Market Competition

Capability	Devices			
	1080 Motion	Zepp Play	StatSports	Our Vision
Force	✓	✗	✗	✗
Acceleration	✓	✓	✓	✓
Speed	✓	✓	✓	✓
Stride Length	✗	✗	✗	✓
Stride Frequency	✗	✗	✗	✓
Distance	✗	✓	✓	✓
Deceleration	✗	✗	✓	✗
Active Time (Productivity)	✗	✓	✗	✗

Competition (con't)



Zepp Play



StatSports



1080 Motion

Project Scope

Project Description: A product that improves data tracking for sprinters/runners.

Goal: Create an alternative to devices already established for tracking runner data that is more cost effective, providing similar or improved data sampling for the sprinters/runners.

Assumptions: Must be applicable for all running athletes (must consider different statutes) and slightly different environment, initial start of distance ran will be primarily focused on.

Market Breakdown

Primary Market: Professional Running Athletes and D1 teams.

Secondary Market: High school Track Athletes, D2 and D3 teams.

Stakeholders: FSU Track Team, FSU Athletics, Dr. Chuy, Dr. Kwan, Dr. Debrunner, USA Track & Field (USATF).

Customer Needs

Program	
Device	

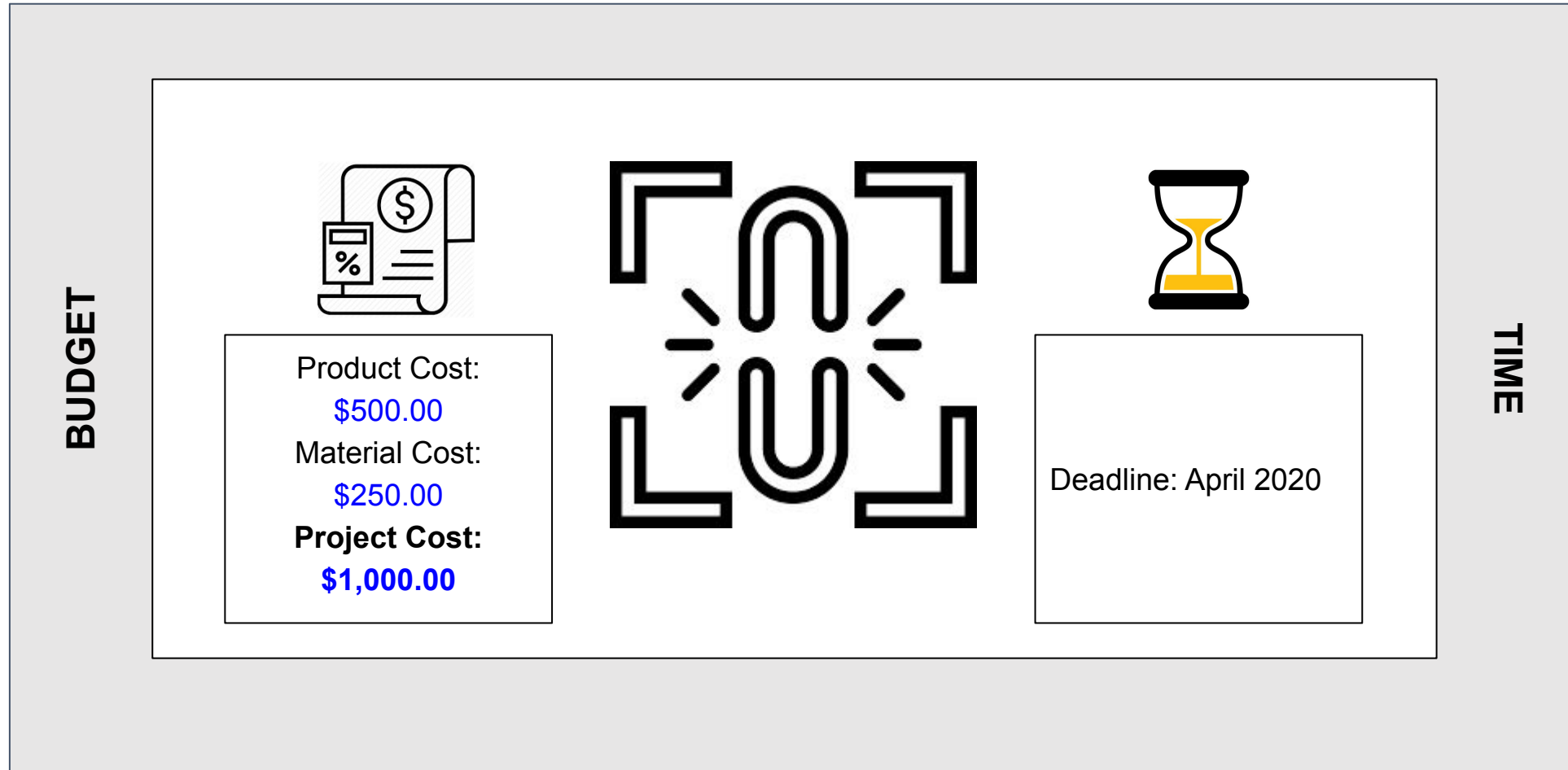
1. A program that provides output data such as stride length, stride frequency, acceleration, and top speed
2. A program that allows the runner to input height and weight
3. A program that is accurate in calculation, efficient in computation, and easy to use
4. A program that allows accessible input and output of the data
5. A device that is water/dirt resistant
6. A device that is affordable for considered market.
7. A device that uses hardware that is lightweight and will stay attached to the runner during sprints

Requirements

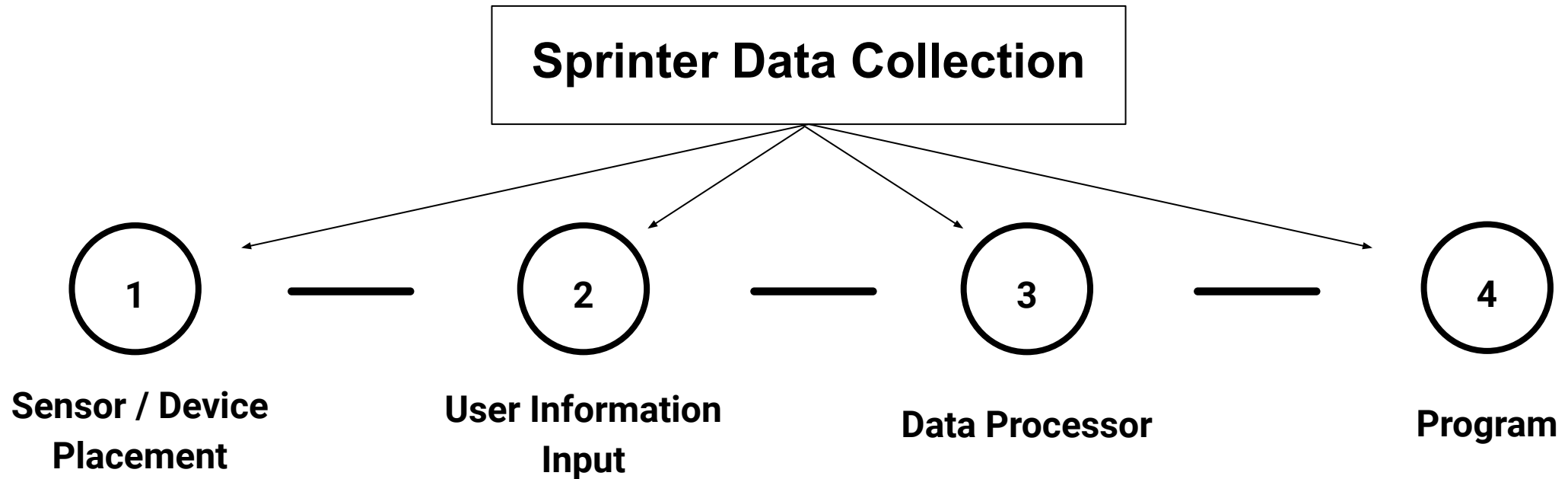
Program	
Device	

Need	Requirement
1, 4	Have outputs displayed on a screen
2, 4	Allow user to enter data as input
7	Net weight less than 4 oz.
5	Waterproof hardware
3	<u>Portable</u> bases that connect to sensors wirelessly

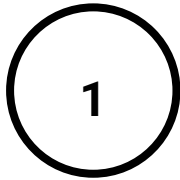
Constraints



Functional Decomposition

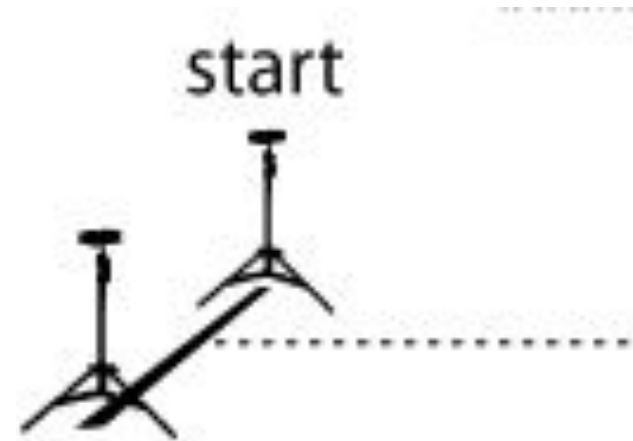


Functional Decomposition

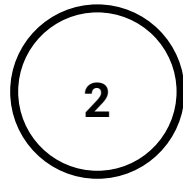


**Sensor / Device
Placement**

- Placement of devices
 - Sensors on runner
 - Base



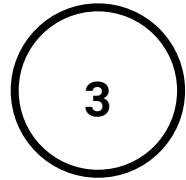
Functional Decomposition



**User Information
Input**

- User Information Input
 - Allow for multiple runners
 - Information stored
 - Name
 - Height
 - Weight

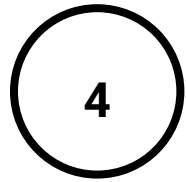
Functional Decomposition



Data Processor

- Data Processor
 - Read and interpret sensor input data
 - Compute the following that can be retrieved by program
 - Top speed
 - Acceleration through intervals
 - Stride length
 - Stride frequency

Functional Decomposition



Program

- Program
 - Variety of operator controls used
 - Ability to save or erase runs
 - Display useful data
 - Feature to view changes in data / changes over time

Project Summary

- Goals:
 - Assist coaches and sprinters in viewing runner data
 - Focus on device being low cost and accurate
- Give viewable outputs:
 - Stride length
 - Stride frequency
 - Acceleration through different intervals
 - Top speed

Next steps...

- Research
- Meet again with the coaches
- Concept generation
- Concept Selection
- Bill of Materials

Questions