Sprint 2 - Accuracy Design Document

November 24, 2020

Executive Summary

1.1 Project Overview

The product of the specifications is to make the Sphero Robot run a figure 8 course with specific dimensions through the Sphero Edu block code. The robot should run the figure eight course five times. Next, the robot should say “I am the winner’ and flash multicolored lights for 5 seconds”.The intended audience of this product is Professor Gil Eckert, the examiner of this project.

Purpose and Scope of this Specification

Describe the purpose of this specification and its intended audience. Include a description of what is within the scope and what is outside of the scope of these specifications. For example:

Activities that fall within the boundaries of the scope statement are considered “in scope” and are accounted for in the schedule and budget. If an activity falls outside the boundaries, it is considered “out of scope” and is not planned for

In scope

-phase 1 meets requirements of endurance sprint

-audience - professor, and programmers

- purpose - using block code to control robot movements

Out of Scope

- meets the requirements of the accuracy sprint, right now we are only focusing on the accuracy sprint

- meets the requirements of the accuracy sprint, right now we are only focusing on the endurance sprint

2. Product/Service Description

2.1 Product Context

This product relates to other products because it uses modern technology and ideas that other products use. This product is not independent and self-contained because it requires the user to interact with an interface and write code for the product to respond to therefore it is dependent on the user. The robot does interface with the Sphero Edu software as it reads code from the file and reacts to it. The user develops block code in the Sphero Edu program from a computer. Then the Sphero robot receives these instructions and follows through with the code that the user input into the computer.

2.2 User Characteristics

Create general customer profiles for each type of user who will be using the product. Profiles should include:

- **Students - Olivia Bellino, Connor Bennett, Ludrianna Bazile**
- **Staff - Gil Eckert**
- **Student experience - Students have a bit of experience using python and using spheroEDU**
- **Staff experience - Professor has much experience using python and much experience in spheroID**
- **Other general characteristics that may influence the product - Not being able to meet up with group members often.**

2.3 Assumptions

List any assumptions that affect the requirements, for example, equipment availability, user expertise, etc. For example, a specific operating system is assumed to be available; if the operating system is not available, the Requirements Specification would then have to change accordingly.

- **The robot is required to test the block code the users create**
- **Only one group member has the robot and is able to run tests when we are not there.**
- **Users must know how to operate and create the block coding**

2.4 Constraints

Describe any items that will constrain the design options, including

- access, management and security - **no constraints with access, management & security**
- criticality of the application - **no criticality of the application**
- system resource constraints - **limited access to robot course room**
- other design constraints - **robot course has design issues with mini crevasse in the floor that can easily make the robot go off course.**

2.5 Dependencies

List dependencies that affect the requirements. Examples:

- **Gantt chart must be created before the requirements are completed**
- **Block code must be finished before running the robot course**
- **Algorithms must be completed before the flowchart is worked on because the flowchart is based on the algorithm.**
- **WIFI**
- **The course room must be available**

3. Requirements

3.1 Functional Requirements

In the example below, the requirement numbering has a scheme - BR_LR_0## (BR for Business Requirement, LR for Labor Relations). For small projects simply BR-## would suffice. Keep in mind that if no prefix is used, the traceability matrix may be difficult to create (e.g., no differentiation between '02' as a business requirement vs. a test case)

The following table is an example format for requirements. Choose whatever format works best for your project.

For Example:

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
ENDUR_01	Start program	robot starts in the same spot it will end	1	11/23	
ENDUR_02	Figure 8, 5 times following the track	robot follows a figure 8 design and will go around 5 times	1	11/23	
ENDUR_03	finish in the starting spot square	The robot should stop after the 5th lap in the same spot it started in.	1	11/23	
ENDUR_04	“I am the winner”	Robot will repeat this words after they go around 5 times	2	11/23	
ENDUR_05	Strobe lights	we made the robot flash blue and red for 10 seconds	2	11/23	

3.2 Security

3.2.1 Protection

Specify the factors that will protect the system from malicious or accidental access, modification, disclosure, destruction, or misuse.

- **encryption**
- **activity logging, historical data sets**
- **restrictions on intermodule communications**
- **data integrity checks**

3.2.2 Authorization and Authentication

Specify the Authorization and Authentication factors. Consider using standard tools such as PubCookie.

Authentication confirms your identity to grant access to the system. Authorization determines whether you are authorized to access the resources. It is the process of validating user credentials to gain user access. Authentication factors required for authorization may vary, depending on the security level.

3.3 Portability

If portability is a requirement, specify attributes of the system that relate to the ease of porting the system to other host machines and/or operating systems. For example,

- Percentage of code that is host dependent- **75% dependent, The host who has the robot is able to create and share code with other group members.**
- Use of a proven portable language- **SpheroEDU is 100% proven portable language and is able to be shared with every group member.**
- Use of a particular operating system - **SpheroEDU**
- The need for environment-independence - **the product must operate the same regardless of operating systems, networks, development or production environments.**

4. Requirements Confirmation/Stakeholder sign-off

Include documentation of the approval or confirmation of the requirements here. For example:

Meeting Date	Attendees (name and role)	Comments

11/23/2020	all group members	ran the program for the robot and got our final video of the robot running the accuracy sprint

5. System Design

This section will provide all details concerning the technical design, staffing, coding, and testing the system

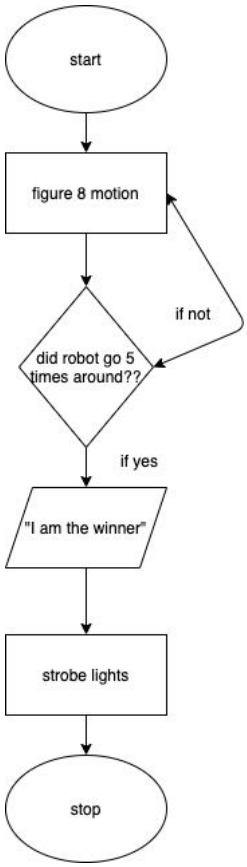
5.1 Algorithm

Develop and describe here the algorithm that will be used to provide the required performance of your software

- Start in center of figure eight
- Robot to move in line in a figure eight path
- The figure eight motion must loop five times
- Finish in the same position is as the start
- Robot must speak “I am the winner”
- Multicolored lights flash for a total of five seconds

5.2 System Flow

Develop a flowchart (and show here) that accurately depicts how your software application will act to fulfill the algorithm



5.3 SOFTWARE
Describe software languages/platforms/api's used to develop and deploy this application

SpheroEDU
Microsoft Excel
Google Docs

5.3 Hardware

Describe hardware platforms that were used to develop, test and demonstrate this application
-Robot
-Laptops

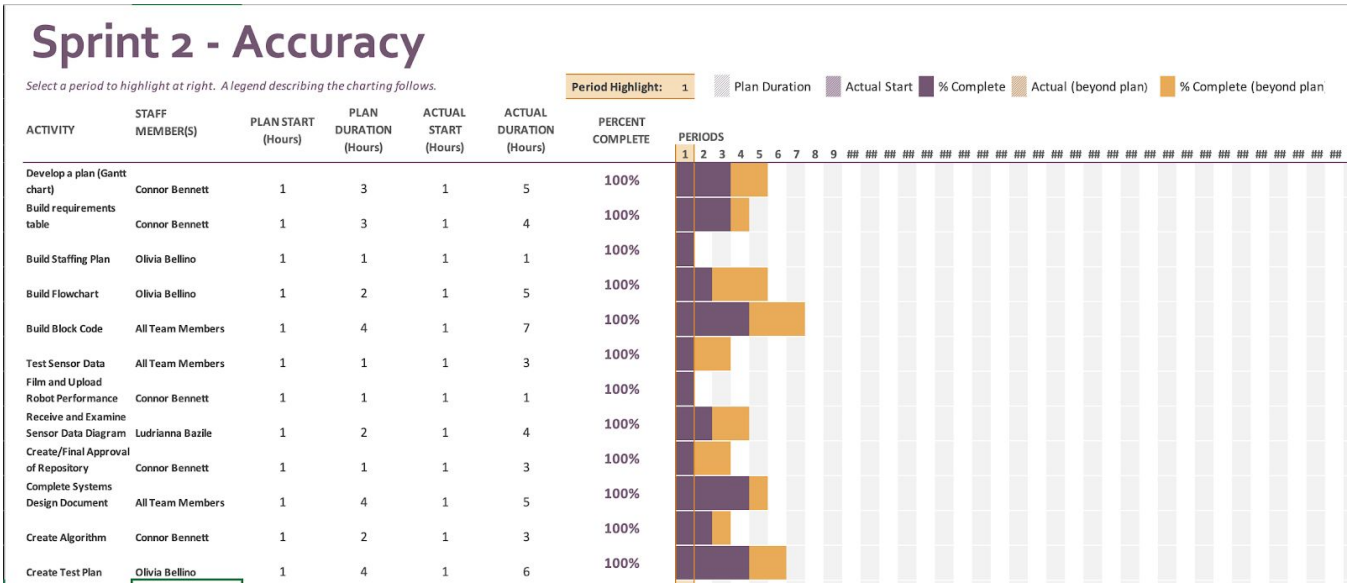
5.4 Test Plan

Include a test plan showing all unit tests performed for this application, Include test rational, test date, staff member, pass/fail status

Reason for Test Case	Test Date	Expected Output	Observed Output	Staff Name	Pass/Fail
Robot must complete a circle	11/20/2020	Robot does a full circle	Robot does a full circle	Ludrianna	Pass
Robot must complete a figure eight	11/20/2020	Robot does a figure eight	Robot does a figure eight	Connor	Pass
Robot must say "I'm a winner"	11/20/2020	Robot says "I'm a winner"	No sound	Ludrianna	Fail

Robot must display multicolor for 5 seconds	11/20/2020	Robot strobe from red to blue for ten seconds	Robot strobe from red to blue for ten seconds	Olivia	Pass
Robot must say “I’m a winner”	11/22/2020	Robot says “I’m a winner”	Robot says “I’m a winner”	Ludrianna	Pass

5.5 Task List/Gantt Chart



5.6 Staffing Plan

Insert a chart/table that depicts the roles and responsibilities of each team member that worked on this project

Name	Role	Responsibility	Reports To
Olivia Bellino	project manager	Project managers play the lead role in planning, executing, monitoring, controlling and closing projects. They are accountable for the entire project scope, project team, resources, and the success or failure of the project.	Group manager

Connor Bennett	documentation	A Documentation Manager plans and directs documentation projects for timely delivery of documents, publications, and online content. May act as final approver or editor for projects. Additionally, a Documentation Manager may require an associate degree or its equivalent.	Project manager
Ludrianna Bazile	programmer tester	Organizing programs and activities in accordance with the mission and goals of the organization. Developing new programs to support the strategic direction of the organization. Creating and managing long-term goals. Developing a budget and operating plan for the program	Project manager