

# **Stakeholders, Goals and Task Analysis**

## **Team 6: micro:bit**

### **Undergraduate Students:**

Brandon Searle  
Jared Schrauben  
Liam Andersen  
Ryan Philipps  
Sam Stevenson  
Sarah Lindbeck  
Scott Sviland  
Ted Nachazel  
Tyler Marenger  
Wiley Roemer

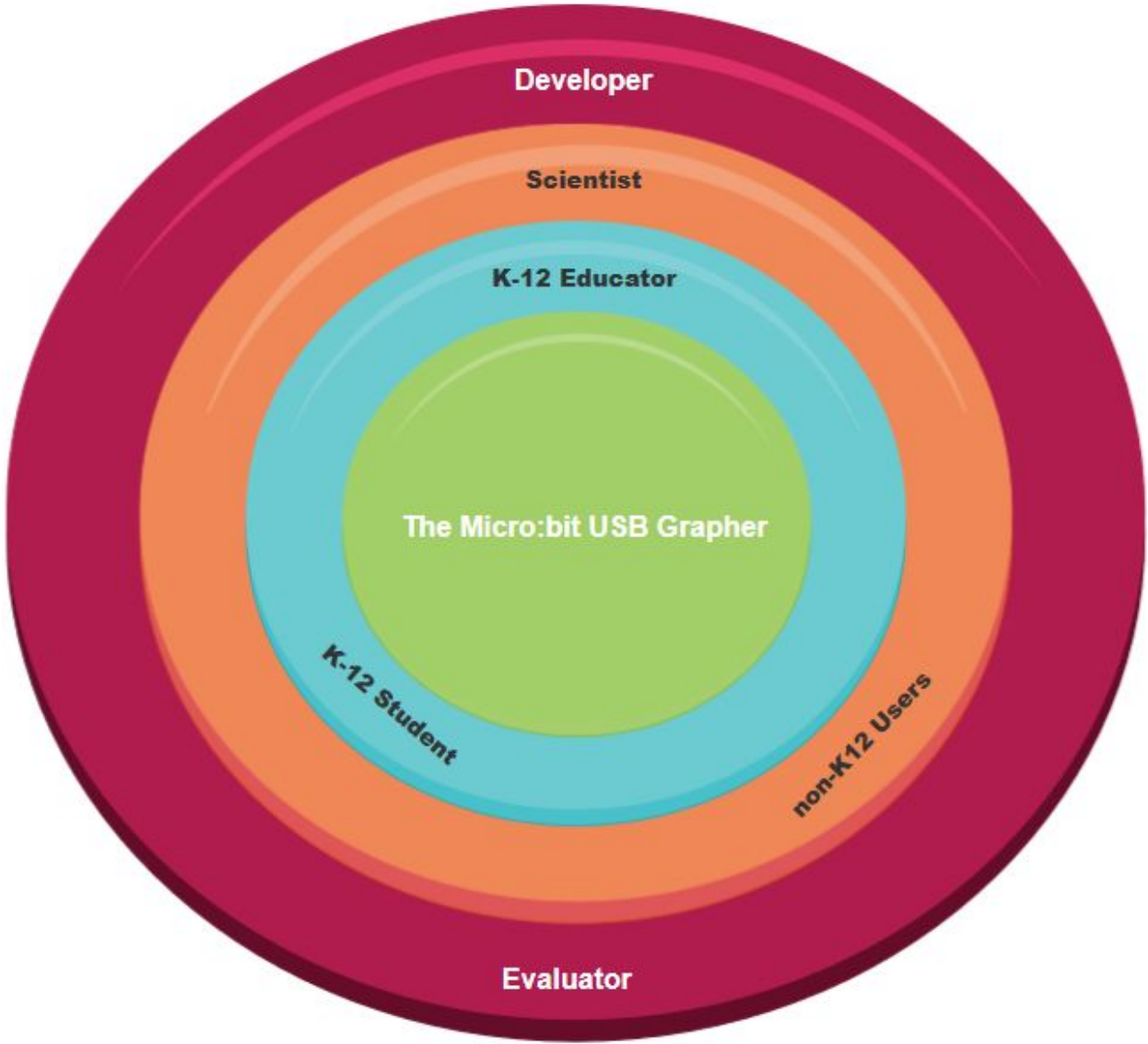
### **Graduate Student:**

Steven Ding

## **System Description:**

The primary purpose of the Micro:bit USB Grapher application is to develop a stand-alone website that will be used to collect information from one or more micro:bits and graph time-series data and events. The application will allow users to graph a wider range of data than Makecode enables. Additionally, it will allow the user to interact with the data in ways that are not supported by Makecode such as finding features of interest. The deliverables for this project include the implementation of the web application and the construction of instruction manuals and documentation.

# Stakeholders Onion diagram:



-  Tertiary Stakeholders
-  Secondary Stakeholders
-  Primary Stakeholders
-  The System

## **Stakeholder Descriptions:**

**The System:** The micro:bit USB Grapher App is the system of the onion model.

All other stakeholders will be influenced by this app directly or indirectly.

**Primary Stakeholders:** K-12 students and educators are the primary stakeholders.

The educators will use this app as a teaching aid for their K-12 students. The main

use will be display and output collected data for different experiments. K-12

students, usually middle or high school students, are also direct users for this app.

They collect various formats of information using the micro:bit with the help of the app and see the data collected.

**Secondary Stakeholders:** The scientist himself is a secondary stakeholder, he

needs a way to display collected data and introduce the system to educators and

other potential users. Once the system is finished, the user may not be limited to

K-12 programs, others who own a micro:bit may use this app for similar purposes, data collection and display.

**Tertiary stakeholders:** The programmers and also evaluators are also influenced

by the app. The feedback and performance of this app can affect future work.

## Stakeholder Goal Influence Table:

Stakeholders	Goals	Influence
K-12 students	Record data of various formats under the guidance of their educator. See the data collected. Expect a simple interface.	Need the UI to be clear or provide a simple guide to familiarize with the interface. Provide most direct user experience and feedback on collecting and displaying information.
K-12 educators	See the data collected, export the information to a file.	Need an easy way of viewing and exporting the data of various sizes and formats. Provide feedback on the performance of this app.
Scientists and other users	Use the app for various purposes. Show others how to use the app.	Without the help of the K-12 educators, other users may need a detailed yet straightforward guide for using the app. They give advice on designing the app and determine what sort of data are micro:bit collecting.
Designers	Design a user-friendly interface and internal logic that both students and educators can have easy access.	The decisions of the designers will directly impact the app functionalities and the accessibility of the interface.
Evaluators	Evaluate the product before getting actual user feedback and provide improvements.	They will provide ideas to the designers and make the app better for users. This can impact user experience and also the app functionalities.

**Summary:** The primary stakeholder are the direct users of the system, they need the interface to be clear and straightforward, and can provide actual use feedback. The designers should consider their demand mostly. The secondary stakeholder are potential users that can benefit from the system, they also need guidance or documentation to utilize the app. Tertiary stakeholders are from greater society and influenced by the product. The performance of this app will impact their decisions.

## Personas:

### Primary users:

Name	Qyu	Scott
Age	14	34
Occupation	K-12 program student	K-12 educator
Description	Qyu is a high school student that is in the K-12 program who is interested in computer science. He is a fast learner of new things and is willing to conduct different experiments. He is currently using the micro:bit for school projects and already knows how a micro:bit works or at least how to use one.	Scott is a new educator of the K-12 program. Majored in physics and knew little about computer science. His new task of teaching involves letting the students record outdoor temperature. He never used or heard of micro:bit. He is eager to learn but makes mistakes very often.

### Secondary users:

Name	Tom	Alice
Age	23	56
Occupation	Graduate student	Engineer
Description	Tom is a graduate student majoring in Computer Science in a Chinese University. He is not good at English and whenever he comes to a long paragraph in English, he uses google translate. He is in a research project that needs him to record noise volume in different public areas. He owns some micro:bits and the micro:bit app drew his attention. He has some friends to help him, also Chinese, who follow his instructions.	Alice is a retired engineer, she is good at reading instructions but slow at computers. She wanted to measure outdoor temperature just for fun. She wants to see how the temperature goes on her phone. She has a short memory and often forgets things. She also wants to share her records with her family and friends.

# Simplified Hierarchical Task Analysis

## Simplified Hierarchical Task Analysis:

### Help view

- Help connect the device
- Help user to collect data
- Resolve frequent problems

### Control view

- Control buttons for recording data
  - Start/stop/pause
- Control over collected data
- Capability for multiple input data stream

### Graph view

- Data display
  - long period for days, weeks and month
  - Pan/zoom on graphed data
  - Show current status of data(collecting/collected)
- “Text events” at certain data points (Graph View)
  - Saving text events
  - Displaying text events

### Export view

- Provide .csv exporting

**Summary:** Once connected the devices, and hit start on the control panel. User gets streamed data from micro:bit or multiply micro:bits, the app visualizes the collected data. The visualized data continuously updates while collecting. The user has control over pausing and stopping the data collection. Also, users can view the collected data by zoom in and zoom out or view data at a certain point. Finally, the system can output the data into a formatted file.



## Appendix: interview notes

- The users may not be limited to K-12 programs once published.
- The data is expected to be once per minute and last for days and months or even longer.
- The app supports Chrome only.
- If possible, make a guide/tutorial.
- Easy to access interface
- Display:
  - Begin and stop (pause)
  - Continuously update
  - Zoom
  - Slide
  - Click/hover
  - Multiple graph
    - Can be in the same graph by controlling show/hide
    - Can be in different panel by selecting
  - Export data collected
- One example: collect temperature information