

VALE Jukebox

Created by: Ben Hare



Exhibit Overview

My exhibit is titled the “Vale Jukebox”. It’s a miniature jukebox designed to promote Lebanon Valley’s Vale Music Group and showcase the talent of the musicians.

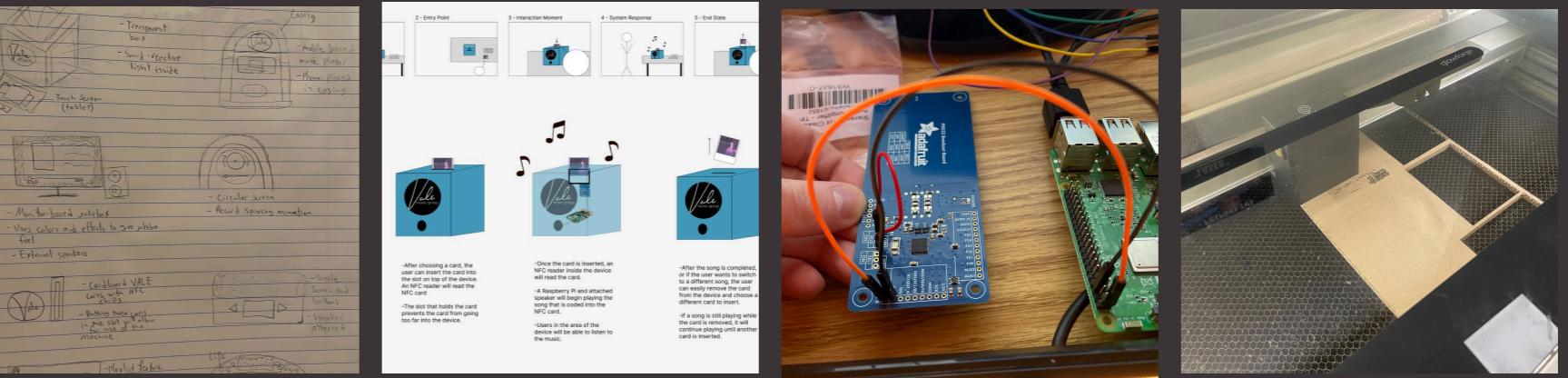
The primary audience for this project are the students of Lebanon Valley College with the secondary audience being visitors or prospective students. This exhibit is meant to produce interest in the Vale program by allowing them to listen to their music in a fun, novel way.

Users can play music from the jukebox by inserting cardboard cartridges into a slot on top of the device. Each cartridge is fitted with an NFC chip that maps to a unique Vale-produced song. Once the cartridge is inserted, an NFC reader inside the box will read the chip and begin playing the song through speakers. If the user wants to switch songs, they can remove the cartridge and insert a different one. If the song plays the whole way through, it will not play anything else until another cartridge or the same cartridge is inserted.

Engagement and Repeatability

This exhibit encourages engagement and gathers interest through its simple design. People walking past the exhibit will become curious after seeing the Vale logo and the speakers sitting outside of the casing, making them wonder if the device is supposed to play music somehow. After seeing the cartridges with album art engraved on them, they will wonder what happens when the cartridge is inserted into the slot on top. Once the music starts playing, it will gather the interest of surrounding people and keep a group of people engaged as they listen to the music. Repeatability is encouraged by offering a selection of songs to choose from. Users can switch songs at any point and listen to each one as long or as short as they would like. If users like a specific song, they can insert the same cartridge whenever they visit and listen to the song as they view other exhibits.

Sketches and Prototypes



30/10
sketches

Refined sketches

Components

Casing

Materials

This exhibit runs on the Single Board Computer (SBC), Raspberry Pi 3B powered using an AC Adapter. The Raspberry Pi has a PN532 NFC Breakout Board connected to it that runs using installed libraries and Python code to constantly read for NFC chips and match the identified chips to a song using unique IDs. Amazon Basics Stereo Speakers were used as the audio output, connected through the Pi's audio jack.

The outer casing for the device was made using acrylic and the Glowforge laser cutter. The cartridges were made with 5/32 corrugated cardboard and were also cut and engraved with the laser cutter before inserting the NFC chips

Testing and Refinement

When starting the design of this exhibit, I started by testing out the NFC breakout board, which took much learning and patience, as I have never worked with this kind of technology before. First, I had to figure out how to wire the reader to the Raspberry Pi. Once it was connected, I used Python code that I had found online to test its reading capabilities and figure out the unique IDs of each of the tags I wanted to use. After creating Python code that will read and play the songs, I then had to test out different ways in which I could get the code to run in the background at all times and when the Pi is booted up. This part took a lot of testing, but I eventually figured it out and gained a lot of insight into coding for Linux in the process. With the logistics figured out, I then had to refine the processes to make them more seamless and clear while also going through several revisions of the casing to ensure that it was intuitive and user-friendly.