PROJECT PLAN
FOR
VARIABLE BOOT DRIVE

CAPSTONE-W25-VBD

PREPARED FOR
D. Kevin McGrath

PREPARED BY
Team Lorenzo

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Change Page

Date	Author	Change	Rev #
01/28/2025	Lorenzo Moon	Document Creation	0

Table of Contents

Executive Summary

To be finalized after the rest of the document is finished. #TODO

Project Data

Mission Statement

This project provides IT professionals with an open-source solution to turn a Raspberry Pi into a fully functional boot device for their custom operating systems while preserving the Pi's full capabilities. Additionally, it doubles as a portable flash drive, ensuring flexibility and efficiency in system deployment and maintenance.

Features

- Mode Selection
  - After automatic login, prompt user to unlock device features
  - Fullscreen prompt for mode selection on touch display
    - USB Mode, Flash Drive Mode, or Desktop Mode
- Password Protected File System
  - Password required to access the file system.
- USB Boot Mode
  - Select ISO from touch GUI
  - Device will be in "USB Boot Mode" to boot into that ISO when plugged into another machine.
  - "None" is default to be treated purely as a flash drive.
- Flash Drive Mode
  - Allows for easy upload of files as USB device
  - Must show up as a drive separate of the USB Boot Mode ISO
- Desktop Mode
  - On-Screen Keyboard
- Web-based File Manager
  - Access the raspberry pi from a page it hosts
  - Upload files to the pi
  - Update the pi
  - System health
  - List of images on the device
- Device Creation Document
  - A step by step guide (with pictures) on how to make one yourself.
- Installation Script
  - A script a user can run and install everything with little knowhow.
  - A script that can be ran to download the entire github repo
  - install all dependencies

- setup all the programs involved
- automatically set the needed daemons.

Release

The project is published at
https://gitlab.cecs.pdx.edu/variablebootdrive/variablebootdrive

Documentation is published at
https://gitlab.cecs.pdx.edu/variablebootdrive/variablebootdrive/-/wikis/home

Upon completion, it will contain all the code, documentation, a DIY guide, and CI Releases.

User Stories

#TODO We need stories that cover each feature.

Architecture & Design

Mode Selection

Front End (GUI)

Artwork, API Calls, And Description.

Back End

The backend will be the programs created for “USB Boot Mode”, “Flash Drive Mode”, and “Desktop Mode”

Password Protected File System

How are files going to be protected? Encryption? Security by obscurity? A simple password and prevent users from Alt-F4ing? More? Less? All of it?

USB Boot Mode

Front End (GUI)

This is handled by “Mode Selection”

Back End

What language will this be written in?
How will this integrate with password protection?
How will you mount the ISO?
Partitions? “Folders as Drives”? Other tech?
What API routes will this have?

Flash Drive Mode

Front End (GUI)

This is handled by “Mode Selection”

Back End

What language will this be written in?

Same as boot mode? Why, Why Not?
How will this integrate with the password protection?
What API calls will this have? (Activate / Deactivate?)

Desktop Mode

This should just close the application.
It should not be closable without password protection.

Web-based File Manager

Front End

Artwork mockup for the interface - Phone, PC/Tablet dimensions
What language?
Need to setup as a daemon.
What API calls need to be sent to the backend?

Back End

What language?
What API calls need to be received from the front end?

Device Creation Documentation

Web-based?
PDF?
Both?
Github sites?
Built into the repository?

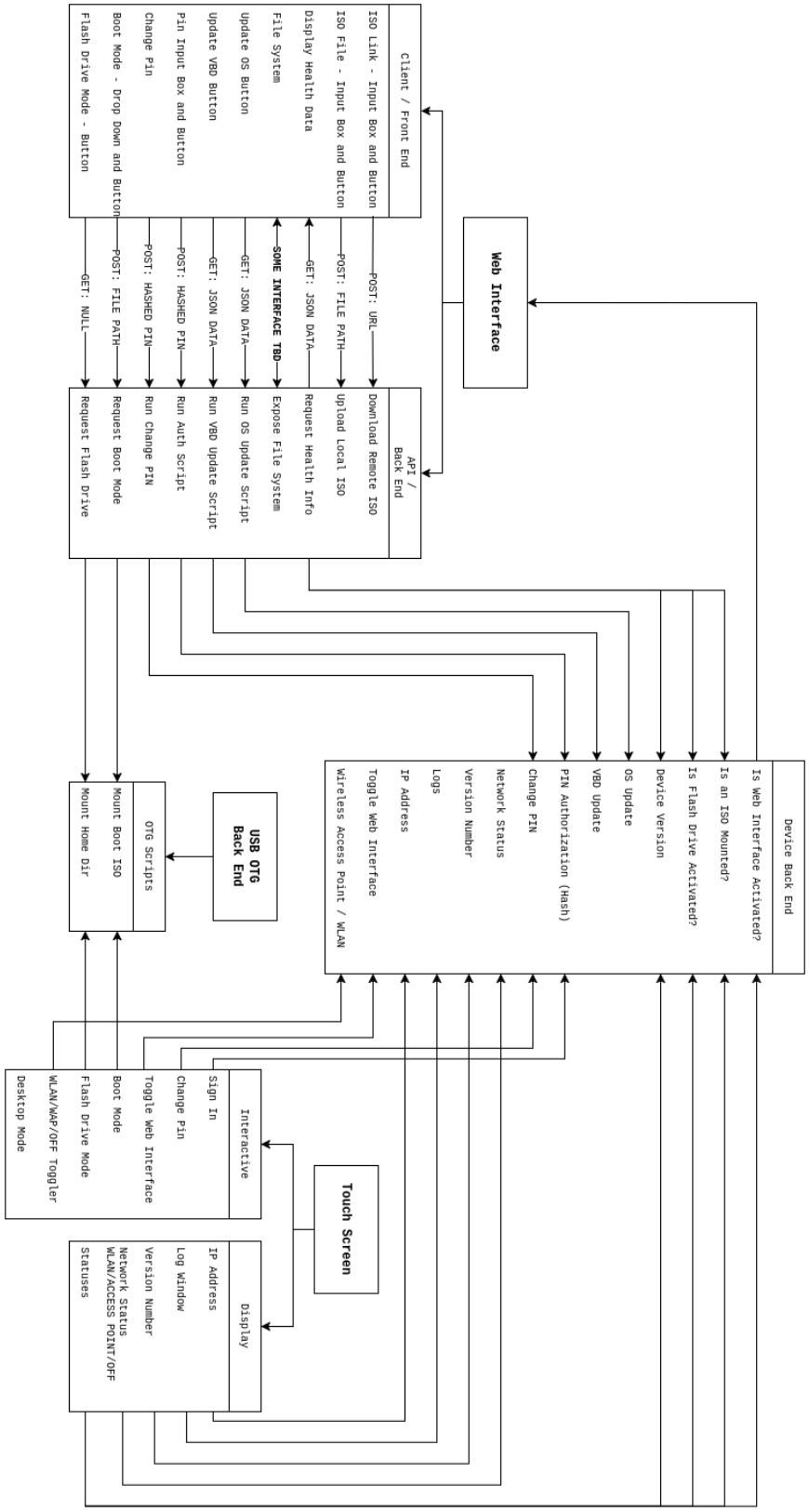

Fig 1. Architecture Flow Chart

Deliverables

1. Proof Of Concept Device
    - Delivered onto Kevin McGrath’s loaner equipment.
2. Image File
3. Update Scripts
4. DIY Instructions
5. Installation Script

All deliverables will be delivered via GitLab repository unless otherwise specified.

Team Roles and Responsibilities

- Lorenzo Moon
  - Team Lead
  - Sponsor Liaison

- Hayden Blanchard
  - Technical Writer
    - Documentation Maintainer (GitLab Wiki Site)
    - Device Creation Document (GitLab Wiki Site)

- Dal Galdri
  - Web Interface Back-End Engineer

- Alastair Ozmond
  - Sponsor Liaison
  - Device Back-End Lead Engineer
  - Install Script

- Colby Rice
  - Touch-Screen GUI Front-End Engineer

- Nathan Simon
  - Quality Assurance Lead
  - Technical Writer
    - Device Creation Document (PDF)

- Isaias Valdez
  - Web Interface Front-End Engineer

- Anyone
  - Alternative Front-End for Touch-Screen.
  - Alternative Front-End for Web Interface.
  - Assist Device Back-End Engineer with supplement scripts.

Resource Requirements

Item	Count	Reason	Cost
Computers	7	To Code	
Gitlab Account	7	To Develop and Maintain	$0
Raspberry Pi 4*	1	Main component	~$50
Y-Cable*	1	Give Pi proper power and connect to the data from the same port.	$9
USB-A Power Block*	1	Prevent power from going from the Pi to the connected computer.	$10
USB-A to USB-A Cable*	1	Connect from the Y-Cable to another computer.	~$5
Touch Display Case*	1	Display for Pi, and Case.	$50
SD Card *	1	Hold all data for pi	~$10

Each member of the team is encouraged to purchase a personal Pi, and if possible the resources to recreate and test the program and device themselves. Most features can be worked on without the USB / Touch element.

* Kevin has supplied 1 of this resource.
Access to the loaner device from Kevin will be based on sprint priority.

Y-Cable:
https://www.amazon.com/Adapter-Charging-Compatible-XL%EF%BC%8CGoogle-Chromecast/dp/B08C5FWQND

Power Blocker:
https://www.amazon.com/PortaPow-Cased-Power-Blocker-Twin/dp/B094G4P3P4

Touch Display Case:
https://www.amazon.com/Raspberry-Capacitive-Touchscreen-Raspbian-Retropie/dp/B09B29T8YF

Plan of Action and Milestones

Milestone	Date Start	Date Complete	Date Required
Project Plan	01/28/2025		03/17/2025
Kickoff Meeting	02/04/2025	02/04/2025	02/04/2025
Weekly Sprint 00 - Research	01/30/2025		02/10/2025
Weekly Sprint 01 - Dev	02/10/2025		02/17/2025
Weekly Sprint 02 - Dev	02/17/2025		02/24/2025
Weekly Sprint 03 - Dev	02/24/2025		03/03/2025
Weekly Sprint 04 - Dev	03/03/2025		03/10/2025
Weekly Sprint 05 - Pres Prep	03/10/2025		03/17/2025
End of Quarter Presentation			03/17/2025
Weekly Sprint 06 - Dev	03/31/2025		04/07/2025
Weekly Sprint 07 - Dev	04/07/2025		04/14/2025
Weekly Sprint 08 - Dev	04/14/2025		04/21/2025
Pre-Week 4 Alpha Demo			TBD
Weekly Sprint 09 - Debug	04/21/2025		04/28/2025
Weekly Sprint 10 - Debug	04/28/2025		05/05/2025
Pre-Week 6 Beta Demo			TBD
Weekly Sprint 11 - Debug	05/05/2025		05/12/2025
Weekly Sprint 12 - Polish	05/12/2025		05/19/2025
Weekly Sprint 13 - Polish	05/19/2025		05/26/2025
Weekly Sprint 14 - FINAL SPRINT	05/26/2025		06/02/2025
Deliver Project			TBD
Final Presentation			06/06/2025
Capstone Celebration	N/A	N/A	06/12/2025