| Function | Input | Output | Constraints | Mechanism/Resources | Note |
|---|---|---|---|---|---|
| 1.1 Pre assemble system | Parts, Frame, Enclosure | Pre-built set | Assembling Time. | Solar Pannel, Batteries, Charge Controllers | add to level 2 function architecture |
| 1.2.1 Mount System | Pre-built set | Mounted Station | Assembling Time, Height. | Installation Kit | |
| 1.2.2 Inspect Mounting Equipment | Assembled System | Hardware ready system | Time of the Day. | Test Tools | |
| 1.3.1 Install Base Image | SD card, USB, internet, disk image. | Bootable System | Disk Size. | Image Burner Software, Software Repository | Disk Size must be more than image size |
| 1.3.2 Config new image | Network Parameters | Wifi Enabled System | | Mini computer, config file. | |
| 1.3.3 Add Update Over Air | Version Number | New Updated Version | | Internet, Update Control (Software Repository) | |
| 1.4 Perform Ventilation | Heat flow | Heat flow | Air throughput, Fan Speed. | Fan, Passive Cooling. | |
| 2.1.1 Measure Windspeed | Windspeed | Windspeed | Power, Wind Speed | wind turbine sensors. | |
| 2.1.2 Measure Soil Moisture | Soil | Soil Wetness | Water Level | soil moisture sensors. Micro-controller sketch (ESP 32). | |
| 2.1.3 Measure Humidity | Humidity | Humidity | Power supply | humidity control. | |
| 2.1.4 Measure Wind Direction | Wind | Wind direction | Power supply, maximum windspeed | battery | |
| 2.1.5 Measure Temperature | Temperature | Temperature Reading | Power supply | battery | |
| 2.1.6 Measure Rainfall | Rain | Rain Fall Rate | Power supply | battery | |
| 2.1.7 Measure UV | Sun light | UV reading. | Power supply | battery | |
| 2.2.1 Extract | WindSpeed, soil wetness, wind direction, temperature reading, rain fall | Signal Flow | CPU load, memory | Sensors sets, Wireless Networking, mini computer. | |
| 2.2.2 Transform | Signal Flow | JSON | CPU load, memory | Node-Red Software, mini computer. | |
| 2.2.3 Load | JSON | Service Port | CPU load, memory | Database software, data preview software. | |
| 3.1.1 Preview Environment Info | Service Port | | CPU load, memory | Webserver, mini computer, preview software. Mobile device. | |
| 3.1.2 Preview Maintenance Info | Inspection Log | Web maintenance log preview | | Webserver, Mobile Device. | |
| 3.2.2 Give system access. | User Credential | Authorization | | Wireless network, mobile device. | |
| 3.2.1 Create ad-hoc network. | trigger command | ad hoc network active | time to complete | script to run | |
| 3.3.1 Built in-house service for Tracking | Services Type/Number | Services Availability | CPU load, memory | Container Technology, Cloud Tech. | |
| 3.3.2 Track Network Usuage | Network Log | HTML | CPU load, memory | Network Service(Grafana). Networking tracking service. | |
| 3.3.3 Track Monthly Expense | Expense Log | HTML | CPU load, memory | Webservice(Expense tracking service). | |
| 3.3.4 Check Part Availability | Inventory web data from vendor | Part Report | Production Rate, Vendor Commitment on part. | Part Logs | |
| 3.3.5 Track Warranty Duration | Warranty Info | Duration of warranty, type of warranty. | Parts in Inventory | Object Storage, Web Service (Warranty Form). | |
| 4.1.1 Check Moisture Level | Soil Wetness, Rainfall rate. | JSON | Water Level | Soil Moisture Sensors. | |
| 4.1.2 Predict Water Reservoir | Water level | True/False | Water Max | Water predict log | Decide if water needed. |
| 4.2.1 Connect Wireless Network | Network name/type | Connection Session | Power control, range. | Wireless modem, mini computer. | |
| 4.2.2 Send Turn On Signal. | True/False | Status of Valve | time to complete | Smart Water Valve | |
| 5.1 Detect System Failure. | Error code | Error code, beep sound, light indicator. | time to live signal | Status Report, wireless network, LED bulb, mini speaker. | |
| 5.2.1 Generate User Input. | Form Capture. | User Input. | Session Number, CPU Load. | Web form to capture (Inventory Log, Dashboard). | |
| 5.3.1 Collect Parts Handbook. | pdf files, html files | pdf files, html files | 10G storage. | On site digital storage. | Use Object Storage for this part |
| 5.3.2 Classification Inspection Type. | User Input | Inspection Type Report | Inspection Log. | Webservice (Inventory Log) | |
| 5.3.3 Classification Maintainance Type. | User Input | Maintainance Type Report | Maintainance Type. | Webservice (Inventory Log) | |
| 5.3.4 Record Condition of System. | User Input | Status Report | Session Number, CPU Load. | Webservice (Dashboard Control) | |