Software Structure

1. Logsheet (data gathering, collection and persistenace from sensor)
   * Get sensor data complete with filtering (alfa ema)
   * Display to OLED
   * Averaging – minute, hourly and daily
   * Saving to local storage (LittleFS) hourly base on day of week, daily base on year
   * Data Services for web
     + Sensor configuration
     + Logsheet hourly
     + Trending data (temperature and humidity)
2. Web services :
   * Server side (back end)
     + Static files services (Images, CSS and JS)
     + HTML
   * Client side (Front end) pages / User Interface
     + Home
     + Report
     + Configuration
     + Login
     + Logout
     + About
3. Data Model
   * Sensor parameters (High, Low, Unit, Alarm, alfa ema)
   * Loghsheet (temperature and humidity)
   * User (username, password, email, level)
4. Time keeping for synchronizing sampling
5. Start up
   * Display logo during start up
   * Display welcome messages

Adapun fungsi tersebut di atas, dibagi menjadi beberapa bagian software dengan memisahkan sesuai dengan fungsinya (OOP principles) sebagai berikut :

* dataLogger.ino, datalogger.h

Sebagai program utama berikut sebagai pintu masuk (entry point) yang di dalamnya terdapat tulang punggung (skeleton) program Arduino – ESP :

* Importing libraries
* Global variable and objects declaration
* Setup
* Loop
* logsheet.h, logsheet.cpp – lihat Software structure point i.
* model.h, model.cpp – lihat Software structure point iii.
* sequenceTimer.h, sequenceTimer.cpp – lihat Software structure point iv.
* start\_up.h – lihat Software structure point v.

Flowchart – datalogger

Start

Import required libraries

Declare Variables & Objects

Protype functions

Display.begin() – init OLED I2C for 64x48 pixel

startUp.AttachDisplay() – attach OLED to startUp

startUp.logoDisplay – display logo to OLED

startUp.welcomeDisplay – display welcome messages

setup pin for LED

Serial.begin(11520) – baud rate 11520 bit/sec

LittleFS.begin() – init little FS (local storage ESP8266)

listAllFilesInDir() – list file in LittleFS

loadUser() – for engineer and operator

setupDefaultUser() – active user is guest

dhtSensor.begin() – init DHT11 sensor

logsheet.AttachParameter() – temperature & humidity

logsheet.AttachSensor() – sensor DHT11

logsheet.AttachDisplay() – OLED

logsheet.AttachLed() – LED

logsheet.setTime() -synchronize

N

Y

StartWIFI\_AP(); - WIFI AP init

startMultiWifi(); - Multi WIFI init

WIFI\_AP

urlController() – WEB handling (req – resp)

server.begin() – start server

1

1

isMinute

logSheet.setTime() – set time from NTP

Y

N

logSheet.execute() – per sampling time

mainSequence.execute()

End

Logsheet.execute()

Start

\_samplingTime = samplingTime

\_synchronized

\_samplingSec = 0

\_synchronized = true

End