## SMART HEATING CONTROL AND ANALYTICS OF INTEGRATED OIL AND SOLID FUEL HEATING SYSTEM

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**Description:**

For my computer systems and networks assignment I intend to implement a smart heating control system which will also record relevant data to a MySQL database for further analysis in order to optimise heating control.

The heating system itself will consist of a traditional oil-fired boiler and a wood fired gasification boiler. My intention is measure and control the relevant influencing factors and to control the heating function and switching between oil and gasification systems. A description of how wood gasification works can be found at the following link. <http://www.greenheat.ie/products/boilers/wood-gasification-boilers/>

Aside from being able to control the system over a network my primary focus is the real time data I wish to obtain from the system while in operation. I want to employ industry 4.0 principles for my project, in particular:

* Data being edge driven
* Report by exception
* Data interpreted and analysed in a meaningful way and results fed back into the system to form a closed loop in order to optimise and control it based on complete system influencing factors.

**Tools, Technologies, and Equipment:**

During the implementation of my project I propose to use the following:

* Arduino Uno control boards x 2
* Raspberry Pi with Sense Hat
* LCD display panel
* Thermocouple temperature sensors x 2
* 4 x PT100 temperature sensors using I2C communication
* Push buttons for control
* MQTT Publish and Subscribe
* http protocol for commands
* MySQL to store data
* Python and C++ coding for Raspberry Pi and Arduinos