In this blog, let me tell you about the Product Design Cycle and how I used it to develop a software in the Delft Hyperloop dream team.

As shown in figure, the design starts by understanding the requirements of the customers. I want to focus on this step as it is the most important step because the maximum amount of time is spent on this stage. Most of the times, the customers themselves don’t know what they want. As Steve Jobs said, “It’s really hard to design products by focus groups. A lot of times, people don’t know what they want until you show it to them”. This is true for almost all the innovative product development cycles. This was true in our case as well. After several meetings, the requirements were starting to become explicit like, which sensors are needed, how many are needed and where needed.

So, to develop good control and data acquisition system for your hyperloop pod test setup, you will need:

- A lot of meetings with all the stakeholders/engineers.
- A lot of patience.
- A lot of common sense and imagination.
- Some knowledge about the electrical and electronics engineering (you can build up on it on your way).
- A lot of computers.
• Some motors, valves, drives, sensors, data acquisition devices, shielded cables, and other electrical spares.

• Last but not the least, a lot of tenacity.

The steps to develop good control and data acquisition system for your hyperloop pod test setup are:

• Meet with the stakeholders. Be very patient. It will take a lot of your time. Try to get as many details as possible from them. Ask a lot, and a lot of questions to clear even the minute details. It looks like a lot of work but it will save a lot of errors and work down the line.

• Take some of your imagination and create layouts and diagrams (the whole setup, mechanical and electrical) in your notebook or PC. It will help you in implementation of the first step.

• Configure your individual mini-test-setup for unit testing of the control of sensors and drives.

• After all the functionalities are tested, you are ready.

• When the mechanical structure is ready, start the installation of sensors. Be careful here. All the cables used should be shielded for EMI (Electro-Magnetic Interference). It will look something like in the figure below (beautiful right!! :-D).

• After all the sensors and other components are installed and tested, train the operators and hand it over.
• Even after doing all of this, troubles will occur. So, always be on standby to troubleshoot them.

I tried to cover almost all the steps that I followed or learnt on the way (more learnt than followed ;-) ). I hope that it helps you too for testing your hyperpod or any other extra advanced machine for that matter. This is Sachin Yadav, Powertrain Engineer, Delft Hyperloop.