Hardware Design/Development

In usual cases, every design requires steps that are essential in bringing its hardware to fruition. These steps are:

- Component identification
- Power constraints (Battery, Power Supply, Converters, etc.)
- Schematics Design
- PCB Layout (Generating Gerber files)
- Bill of Materials (BOM)

Before jumping into the development phase, it is to note that simulation of the circuit in tools such as PSpice is often recommended (if applicable) before committing to hardware design.

Schematics Design

After having components sourced and various circuitries designed, everything is to be put together in CAD format referred to as schematics design. Important procedures about this milestone are as follows:

- Design constraints
- Rules to be applied
- Inputs for various sections of the circuit
- Outputs to different sections (connectors, test points, etc.)
- Specific Standards/formats of interest

PCB Layout

This is where physical aspects (mechanical/package) of every component is to be laid out on the board that is to be designed. The procedures for this milestone are:

- Board dimensions/size
- Spacing requirements
- Footprint(s) creation/validation
- Design constraints (traces, geometry, layers, etc.)
- Design Rules check
- Drawing formats
- Manufacturing requirements (thickness, material, etc.)
- Gerber files generation

Bill of Materials

Components and parts that are to be used for the product are to be listed based on the quantities required. Important points about this document are:

- Components sourced for the design
- Make sure it meets electronics design constraints
- Make sure it meets mechanical/packaging/housing constraints
- Make sure it meets other constraints (thermal, industrial, etc.)
- Available or in-stock parts
- Standards to consider (RoHS compliant, etc.)
- Distributor of choice (if any)