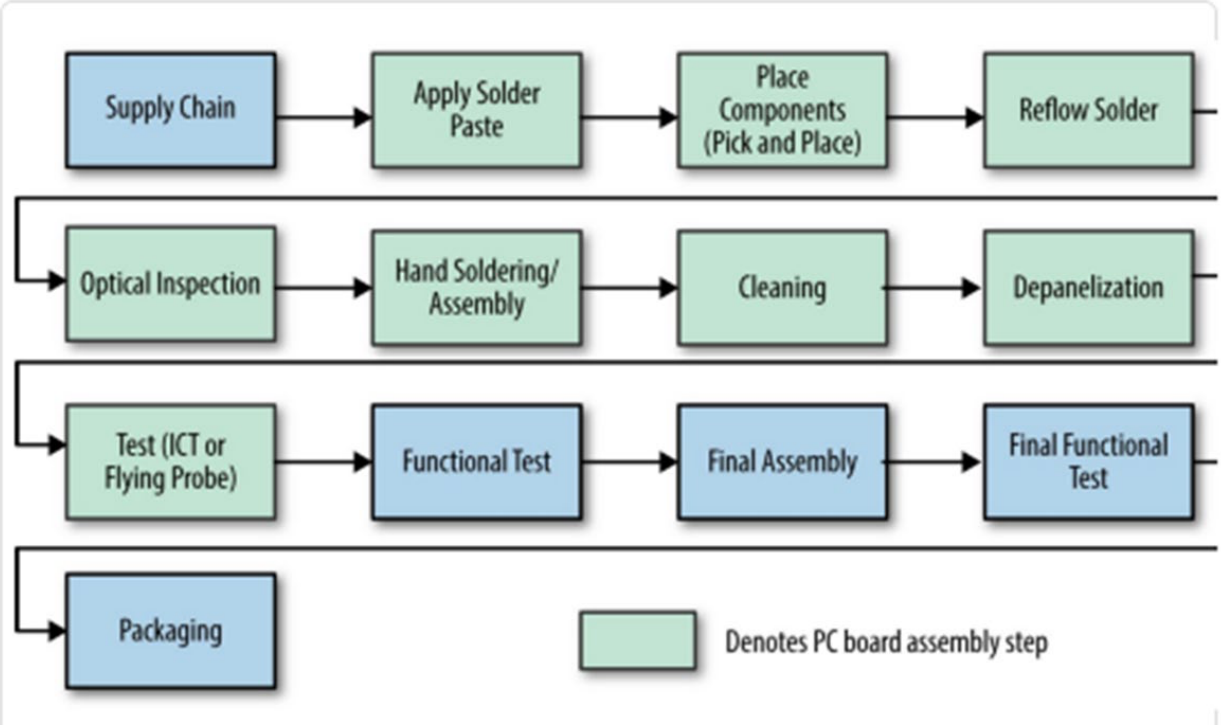
Problem Description

This is a typical flow for the creation of a printed circuit (PC) board based product.



(Image from Prototype to Product, Cohen, 2015, O'Reilly)

Simulate the PC board assembly steps (in green) in the process above. In this model, PCBs (printed circuit boards) arrive at the first station, named above as Apply Solder Paste. The final station in the board assembly is Test (ICT or Flying Probe) (ICT = In-Circuit Test). There are several stations that have a chance of detecting a defect and declaring a failure for a PCB. The stations where there will be a normal percentage chance of rejecting a PCB for a defect are:

- Place Components
- Optical Inspection
- Hand Soldering/Assembly
- Test (ICT or Flying Probe)

A given PCB board type will have unique failure percentage likelihoods for each of these four stations. In addition, each of the eight assembly stations has a unique normal percentage chance of a station failure. If the station fails, the PCB in process at that point will be discarded as if it had a defect.

Failure Type/PCB Type	Test Board	Sensor Board	Gateway Board
Place Components	5%	0.2%	0.4%
Optical Inspection	10%	0.2%	0.4%
Hand Solder/Assembly	5%	0.4%	0.8%
Test (ICT or Flying Probe)	10%	0.4%	0.8%

The chance of a station failure is the same for all boards and all stations = 0.2 % (i.e. 99.8% of the time, a given station will function correctly).

Simulations should be still be able to provide result for simulation runs:

- Type of PCB
- Number of PCBs submitted for assembly
- Number of failures (PCBs discarded) at each of the four stations due to detected PCB defects
- Number of failures (PCBs discarded) at each station due to a station failure
- Number of PCBs that pass the final test station (completed PCB assemblies)