Problem Statement for Nordic Sensing Co. Case Study

1. Context
   1. S – The Nordic Sensing Co. has found that their failure rate for InSense sensors has increased from 1-2% to 15%. They need to be able to identify which manufacturer to shut down or which parts supplier to stop using in order to reduce the failure rate. There are a few potential production facilities that can likely be traced back to being the root cause of the issues.
   2. M – A simple two way table of status by supplier and manufacturer would be an appropriate place to start identifying the root location of the issues. The Cert data would be useful for determining this information.
   3. A – Identifying the facility is an achievable goal given that the dataset is accurate. One limitation of the Cert information is that there are only 20k observations out of the total, but that sample size should be representative of the overall population.
   4. R – This is a worthwhile analysis to conduct, it is a low cost effort to overhaul a major issue that was identified. Going from a 15% to a sub 5% failure rate would be at minimum necessary for Nordic Sensing Co. to maintain good favor with consumers; having increased rates of sensor failure would harm brand trust and could result in reduced profits over time.
   5. T – A timeline of 3 months would be appropriate to perform the analysis, followed by up to a year to allow for logistics to pull the assembly of the faulty parts.
2. Criteria for Success
   1. There would be two different criteria for success in this problem; the first is the identification of the source of the error, and the second would be determining if eliminating that error reduces the failure rate to it’s original levels (1-2%) or to at least it’s ideal threshold of below 5%.
3. Scope of solution space
   1. Ideal solution space would be to identify the source of the issue using the Cert dataset. It would provide the relationship between either the manufacturer that the parts are sourced from or the part that is failing to the rates of failure in the system.
4. Constrains within solution space
   1. The Cert dataset is limited to 20k rows, so an export of multiple datasets would be required so that the full information could be joined and analyzed
   2. Logs only go back two quarters, so historical data will not be as rigorous.
5. Stakeholders to provide key insight
   1. James Hansk – CEO
      1. Unlikely to involve the CEO in a stakeholder meeting however, would probably relay information to him after discussions after taken place so a final decision can be made
   2. Otto Evans – InSense President
      1. Similar to CEO, will be involved in final decision making
   3. Tony Abraham – InSense VP
      1. Will be responsible for presenting final findings to executives
   4. Vince Maccano – Head of Data Science
      1. Provides feedback and support for data analysis
   5. Shane Bucholz – Head Engineer
      1. Provides information on system development
   6. Gary Neumont – Head of manufacturing
      1. Provides insight into production oversight
   7. Jessica Jones – QA/QC engineer
      1. provides insight into where issues can arise
6. Required key data sources
   1. Cert Dataset
      1. Limited in historical and full output but still provides majority of information
   2. Factory specific datasets
      1. It is mentioned that there are factories that have independently collected information, and while the column identifiers are not consistent with the Cert dataset they may be able to be crossreferenced