

# Nordic Sensing Co. Problem Statement: Aubhishek Zaman

**What opportunities exist to identify cause(s) of sudden rise (15%) of InSense sensor manufacturing failing at Nordic Sensing Co. Singapore factories and how to reduce failing rate closer to baseline (below 5%) by tomorrow?**

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## 1 Context

Nordic Sensor Company (NSC), an energy consumption and production based IoT sensor company, is experiencing manufacturing issues with InSense (a consumer product for residential energy usage). 1-2% regular failure rate for manufacturing for the product has been well surpassed by the current failure rate of ~15%. Initial Chi-squares testing to identify the cause (specific part) or source (specific manufacturer) has identified no potential candidate. The manufacturing process is cash intensive and manufacturing as well as product delivery is highly time-sensitive. And hence a more detailed data dependent analysis is required to identify root cause fast and bring down failure rate below at least 5%.

## 2 Criteria for success

Identify root cause(s) for manufacturing failing to reduce manufacturing failure rate below at least 5%. This needs to be done immediately to meet production deadline. Management has ruled out presence of a single source item being the culprit by running a source/specific parts versus error association analysis by Chi-sq test.

## 3 Scope of solution space

Any single cause may not be responsible for the issue at large, since initial non-parametric Chi-Sq analysis of categorical variables such as source and potential causes were not fruitful. A more detailed data-driven analysis will entail performing multimodal regression analysis. Also, the potential solution will only be applicable for the factories working on manufacturing InSense, located in Asia.

## 4 Constraints within solution space

The cause needs to be identified immediately and hence time is of the essence. The data shared as of now focuses on only Singapore facility. The column nomenclature for the same data appears to be hard to interpret. Only two quarter data is presented. An issue originating earlier and manifesting now, would be hard to be identified from this data. 7 sensor components for InSense comes from 26 suppliers making the multifactorial analysis computation heavy and time consuming.

## 5 Stakeholders to provide key insight

Tony Abraham – InSense VP  
Vince Maccano – Head of Data Science  
Anna Landis – LithBat VP  
Gary Neumont – Head of Manufacturing  
Otto Evans- InSense president  
Bernard Ong- CTO  
Karen Chu- LithBat president  
Shane Buchholz- Head engineer  
James Hansk- CEO

## 6 Key data sources

- 1.Cert: Information on supplier source and failure on an excel file with table where column stands for source/vendor
2. Data from Information on supplier and vendor code from the Singapore manufacturing facility

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