Data Science Career Track
Nordic Sensing Co. Case Study Overview

It is your first week on the job as an entry-level data scientist (Jane Smith in this scenario) at Nordic Sensor Company (NSC), a top-five player in the IoT sensor space focusing on energy consumption and production. You have been staffed on the Manufacturing Analytics team; in particular, you will be working on the manufacturing process for InSense energy tracking sensor, NSC's newest offering in the residential energy usage space.

In early-stage development testing, about 1-2% failure rate was normal for manufacturing the InSense sensor. As you can see from the email exchange, your supervisor, Vince, has provided you with an email introduction to the problem and included a forwarded message from the VP of InSense communicating the current sensor failure rate is 15% as well as more details about the data you have available. Vince has tried some Chi-squares testing to identify the cause (specific part) or source (specific manufacturer) to no avail. As you can imagine, the cause of increased failures could be due to a combination of faulty parts and poor manufacturing, or it could be specific to one factory.

The company needs to know which manufacturer to shutdown or parts supplier to stop buying from in order to get the failure rate back down below 5%. Think about how you can frame the problem to identify the culprit of the increase in sensor failures. There is

also an organizational chart below the email exchange to help you identify the key people you need to communicate with and work with while solving this problem.

From: “Maccano, Vince” <VMaccano@NSC.com>
Sent: Thursday, April 2, 7:32 AM
To: “Smith, Jane” JSmith@NSC.com
Subject: Fwd: March InSense stats; spike in fails

Good Morning Jane,

This came to me this morning from our group in Singapore; apparently, there was a sharp increase in failures during sensor testing for InSense that showed up in the March summaries. Execs are pretty upset – we've been pushing hard to drive interest from our OEM partners, and now we are on the hook for massive orders from each of our three accounts. (With four of our factories in Asia refocused solely on InSense, we're able to manufacture a new sensor every 30 minutes or so; if there are problems with our parts or manufacturing systems, we need to know IMMEDIATELY so we can shut down the manufacturing line and address the issue.

Tony (InSense VP) will need to brief the senior leadership team on the situation tomorrow afternoon at the leadership weekly meeting. The data from Singapore is attached here (I know that the column labels probably don’t make much sense since you’re new to all of this – most of these are vendor codes since we have multiple suppliers for each part to diversify our supply chain). There are 26 suppliers for the seven InSense sensor parts.

Any leads as to possible causes of these failures would be greatly appreciated. Let’s meet first thing in the morning tomorrow – you can show me what you’ve done and what, if anything, you’ve found. I’ll need to understand the process you followed, so be ready to explain (and defend) your approach. Also, Tony will need to be able to understand and present your findings to the broader executive team, so please be ready to communicate your insights in a way that is accessible to people who are not as technically inclined as you or me.
Thanks, and again, welcome to the team!

Begin forwarded message:

From: "Abraham, Tony" <TAbraham@NSC.com>

Sent: Thursday, April 2, 5:45 AM
To: "Maccano, Vince" <VMaccano@NSC.com>
Subject: March InSense stats; spike in fails
Dear Vince,

As you heard during the call yesterday, we saw a spike in InSense sensor failures in March during pre-ship testing. Leadership is not going to like this – we've got huge advance orders for InSense with our key accounts. I've done the Chi-squares but that hasn't yielded a smoking gun. We need your help to identify possible factors leading to these failures.

Here is data from Cert (I hope Excel format is ok). The system limits exports, so this only has 20k rows. You can tell which drives failed by the column titled "STATUS" (Fail rate was about 15% on these sensors). The data covers manufacturing dates going back two quarters with dated results for testing. Additionally, you can connect the parts suppliers and manufacturer to each InSense sensor and whether it failed on testing.

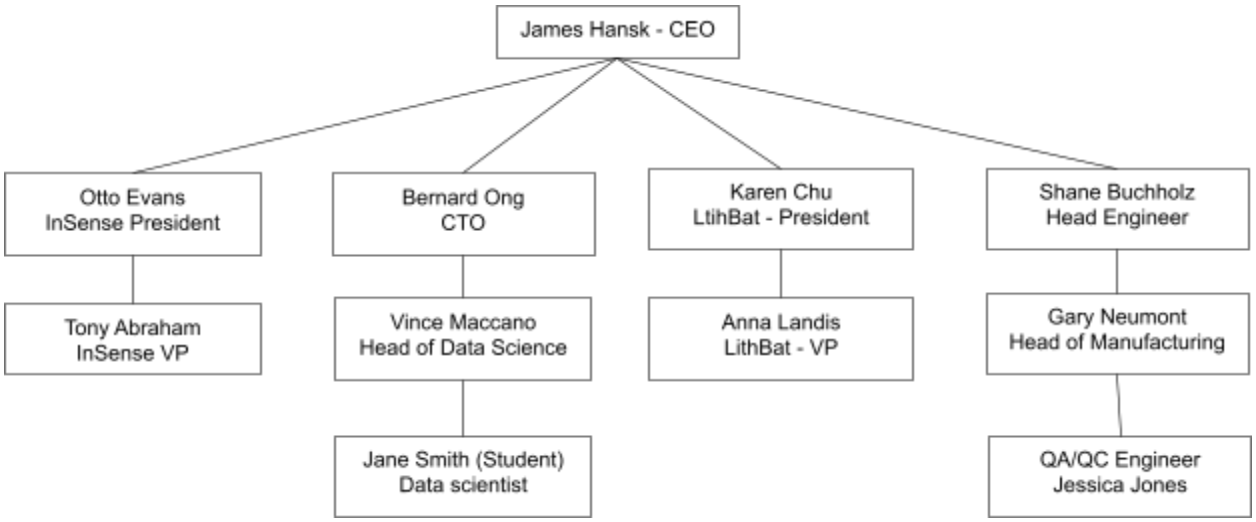
Thanks, Vince; we're really in a bind here. Maybe your data magic can uncover something that we haven't been able to find.

Please keep me posted on your progress.

Tony

Tony R. Abraham, MBA
Vice President, InSense
Nordic Sensor Company

NSC - Organizational Chart


James Hansk - CEO
Otto Evans
InSense President
Bernard Ong
CTO
Karen Chu
LtihBat - President
Shane Buchholz
Head Engineer
Tony Abraham
InSense VP
Vince Maccano
Head of Data Science
Anna Landis
LithBat - VP
Gary Neumont
Head of Manufacturing
Jane Smith (Student)
Data scientist
QA/QC Engineer
Jessica Jones