After a review of the diaper industry and seeing its fast evolution over the last 50 years is imperative to look again at the process and the available data that is at your hands to obtain a better understanding of areas of opportunity that can be waiting to be revealed bringing new improvements that be capitalized by the industry.

***Customer request: We want to ensure good quality diapers.***

Typically the industry in this field look at some quality factors to determine the goodness of their production system as well as the goodness of their finally products, and based on our study the most crucial are the ones listed below.

The quality of this product (diapers) usually is measured during the production system by the following characteristics:

* Diaper absorbency
  + Polymer/Fiber ratio in the absorbent pad
  + Size and distribution of the particles
* Fit & comfort
  + Roughness,
  + Leakage check
  + Ergonomics

To capture & characterized the quality virtue of the final product some measurements have to be taken during the different phases of the production of a diaper which would give us a better understanding of the quality level in the two areas listed above.

For that the following information is needed (if available):

1. What kind of method is used for the nonwovens fabric sheets? (wet or dry laid)
2. What is the method used for the incorporation of the polymers into the absorbent pad?
3. Do you have a way to control the mixture polymer and fibrous material? Up to what level can that be control (sensibility of the tools involved in this)?
4. How often you take sample measurements of the diaper-sized units? Random samples every batch? How many?
5. Do you have any measurements in relation to the roughness of the contact surface of the diaper?
6. How often do you measured the location of the alignments of the components? Is there a standard that needs to be followed?
7. What is your current number of diapers obtained from every square yard of material? How often that value is measured?
8. Do you have a quality standard? Which one? In the current system, what are the values that characterized a quality product? What is the ratio of good/quality diapers vs faulty products?

Based on the answer above the following data might be needed as well (if available):

1. Rate of Diaper production
2. Polymer/Fiber ratio
   1. If there is a gold standard and actual measurements provide both.
3. Size and distribution of the polymer/fiber particles.
   1. If there is standard and measurements provide both, with regularity of measurements (Example: every diaper, every N amount of diapers or every batch)
4. Absorbency values, either:
   1. Demand Wettability or
   2. Gravimetric Absorbance
5. Production rate per cycle (day, week, month)
   1. Faulty products per cycle
6. Roughness of the contact surface (if available)
7. Measurements for alignment/location of components and/or any measurement of ergonomics available.

Based on the input that we might receive from you, the project idea might change or be get polished a little bit more:

Build a machine learning model to predict the combination of events than can lead to a bad quality product based on early indications. The machine learning model will predict based on early indications if the quality of the diapers might be impacted if the values measured in one of the stages named above changes. By doing this our goal is to provide a predictive tool that would help to only react to a quality problem, but proactively look for any indication that a problem might be coming and provide enough time to make the appropriate changes and therefore minimized losses.

Alternatively based on the information that can be provided the machine learning model can supply a way to predict the absorbent value of the diaper (pad/core) based on the provided measurements of particle ratios, particle sizes, production rate, faulty products rate.