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Dashboard Design

(1) Determine the audience. Who will use the dashboard? Ex. Sales manager,

This Dashboard is intended to be analyzed by the Chief Operating Officer (COO) of the wind-farm company to have an overview of all the wind farms around the world and their performance, over a period of time. The data was recorded every 10 minutes for each of the 8 wind-farms and comprises the period from 1/3/2016 00:00:00 to 31/5/2016 23:50:00.

(2) Determine the objective. Which is the decision-making goal of this dashboard? Ex. Understanding daily sales performance per store,

A clear objective for this dashboard was defined as having an easy and visual way of comparing and analyzing wind-farm performance using different metrics.

For example:
- Comparing by Aerogen manufacturer, operator or maintainer.
- By Date.
- Performance of each windmill.
- Occurrence of Alarms.

This will help the COO to make better decisions in terms of Aerogen manufacturing for future wind-farm investments, recognize underperforming wind-farms or changing operators and maintainers that generate superior performance. The ultimate goal is to understand the variables that affect power generation over time and find the best possible combination.

(3) Determine the metrics and the content. Which type of content will appear in the dashboard? Ex. In terms of elements: KPIs, filters, graph. And in terms of content: ex. line spoilage costs, maintenance and repair spending, and

Taking into account the audience for the Dashboard, COO, and the time constrains the user has, the intention was to focus on 4 crucial aspects for wind-farms operations:

1. Average Wind-farm Power Generation & Availability Overview
   1.1. It will be a map showing the locations of the different wind farms with a circle and a label showing the **total Power Generation on Kw/h** and the **% of the total Availability**.
   1.2. Each wind-farm will have a different color and the size of the circle will be determined by the number of windmills.
   1.3. This will be useful to get a quick overview of each wind farm performance and size.

2. Average Windmill Power Generation by day
   2.1. In order to be able to compare the different wind-farms its mandatory to divide the average power generated in a day by the # of windmills, so a direct comparison can be made thus generating insights.
   2.2. Here there would be a line graft with the y-axis: Ind. Windmill Power Generation and the x-axis: time interval (Days), and all of the wind-farms will be plotted.
   2.3. A "Minimum Acceptable Performance" measure was created to visually help to recognize the underperforming windmills. The value was set to 100 Kw/h.

3. Total Reparation Time (hours)
   3.1. This able will show the total reparation time of each wind-farm in a defined period of time. Reparation time is crucial to augment wind-farm performance and ultimately generate a higher power output.
   3.2. Visual Colors will be used to interpret the numbers, from dark green meaning great reparation time to red meaning over the average reparation time. The average was set to 11.000 hours.
   3.3. It would be sorted from least to greatest reparation time for a better visual representation.

4. Total Alarm Occurrence
   4.1. Monitoring Alarm occurrence in percentage over the total is a great way to evaluate operations performance and find underperforming wind-farms.
   4.2. This table will show on the x-axis 3 dimensions for the Generator, Rotor, and Others alarm and 2 columns for 0 meaning no Alarm and 1 for Alarm.
   4.3. Each wind-farm will have a value in each of the 6 cells with a percentage of occurrence for a defined period of time.

All of this 4 Worksheets will be filtered by:

- Wind-farm name
- Aerogen
- Operator
- Maintainer

- Month
- Day

(4) Determine the levels of data: Which data aggregation level will be required by the audience? Ex. plant level vs. county level

According to the data and the audience as it was mentioned before, the data aggregation level is being shown in a wind-farm level in order to be able to compare performance and get a detail overview of the business.