



Anomaly Detection and Scalability in Chemical Manufacturing

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Ascend Performance Materials



Ascend is the world's largest fully integrated producer of polyamide 66 Resin. We manufacture and supply world-class plastics, fibers, fabrics and chemicals for the global market. We control every stage of manufacturing, ensuring the highest reliability, quality and performance.

Headquartered in Houston, TX, Global presence

Operations over 65 years.

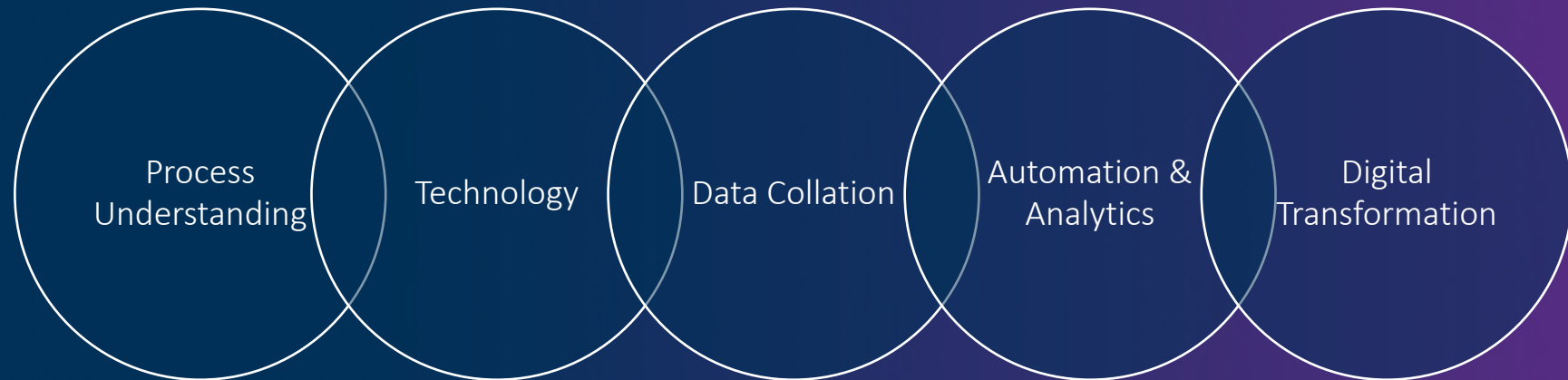
We create performance materials that improve the quality of life today and inspire a better tomorrow



Digital Transformation & Scalability

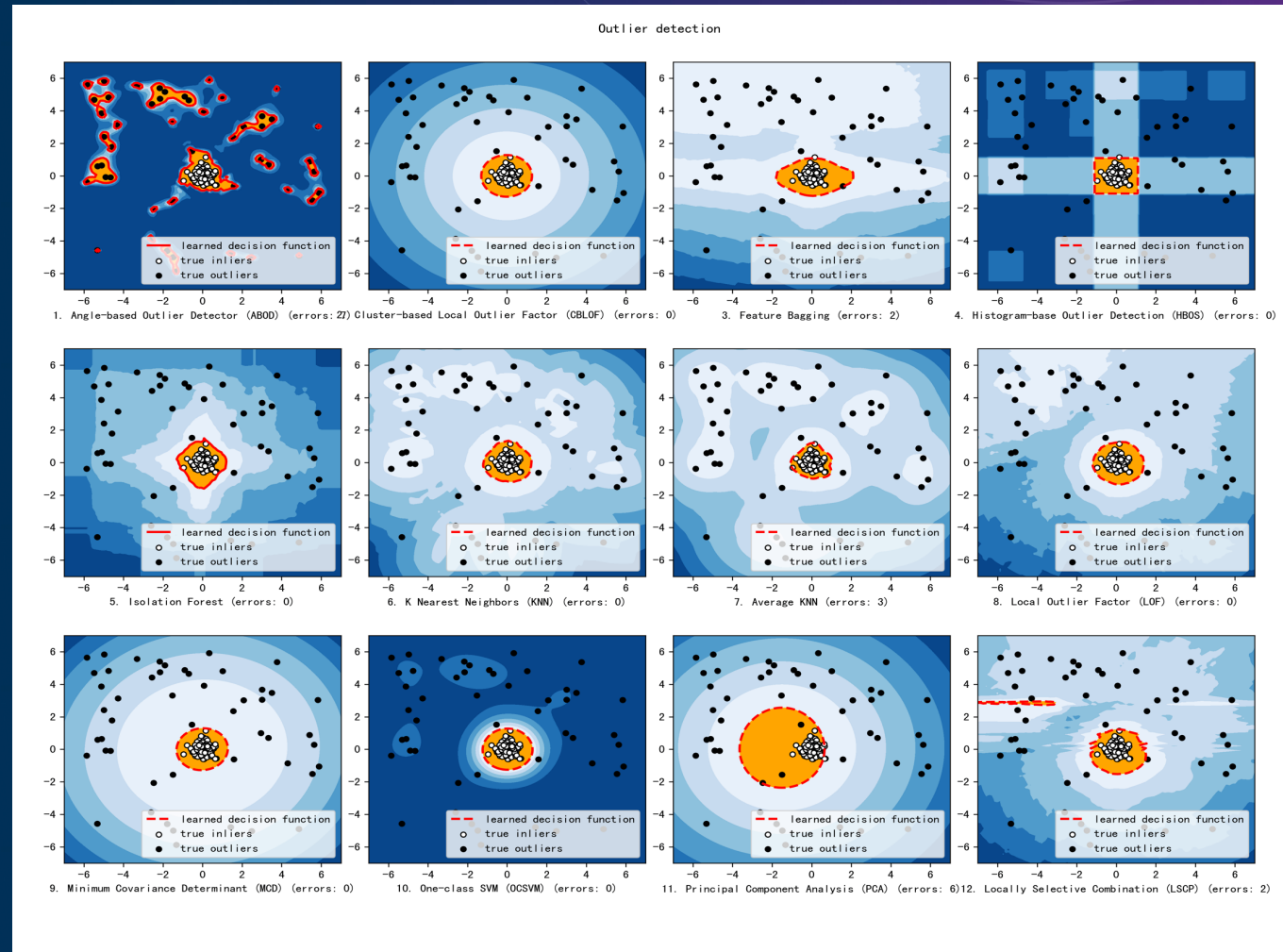


- Why? Empowering people
- Collaboration
- Tools: Power BI, SEEQ
- Change Management
- Training people



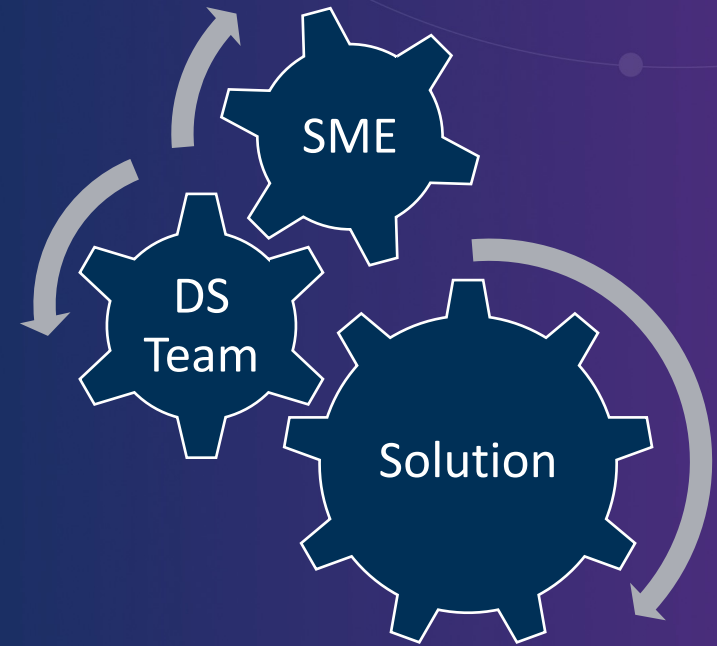
Anomaly Detection (AD)

- What is AD?
- Importance :
 - Process visibility
 - Prioritize maintenance
 - Identify indicators of failures
 - Realtime monitor
- Methodology



Why did we use Seeq ML?

- Transferable
 - Pumps, compressors...
- Easy to use
 - Directly access in Workbench
- Iterative & Collaborative
 - Learn from false positives
 - Shareable



Implementation

- A compressor with 170+ variables
 - replacement \$1.8M
 - significant failure \approx \$1M
- Variable selection
- Model
- Monitor real-time
- Next step!

Flow Rate 1 01.Contribution Maximum: 0.0731 Average: 0.0159	Level Vessel 2 01.Contribution Maximum: 0.0777 Average: 0.0137	Level Vessel 5 01.Contribution Maximum: 0.0704 Average: 0.0156	Pressure 1 01.Contribution Maximum: 0.039 Average: 0.0113	Pressure 4 01.Contribution Maximum: 0.0718 Average: 0.0153	Temperature 2 01.Contribution Maximum: 0.0596 Average: 0.0151	Vibration 3 01.Contribution Maximum: 0.0857 Average: 0.017	Vibration 6 01.Contribution Maximum: 0.1187 Average: 0.0155	Composition 1 01.Contribution Maximum: 0.0796 Average: 0.0133	Pressure 8 01.Contribution Maximum: 0.0441 Average: 0.0143
Flow Rate 2 01.Contribution Maximum: 0.1479 Average: 0.0115	Level Vessel 3 01.Contribution Maximum: 0.0667 Average: 0.0164	Level Vessel 6 01.Contribution Maximum: 0.0747 Average: 0.0136	Pressure 2 01.Contribution Maximum: 0.0461 Average: 0.0133	Pressure 5 01.Contribution Maximum: 0.0481 Average: 0.0132	Vibration 1 01.Contribution Maximum: 0.0906 Average: 0.0168	Vibration 4 01.Contribution Maximum: 0.1 Average: 0.0149	Vibration 7 01.Contribution Maximum: 0.0454 Average: 0.0133	Pressure 6 01.Contribution Maximum: 0.0754 Average: 0.0126	Pressure 9 01.Contribution Maximum: 0.0726 Average: 0.0125
Level Vessel 1 01.Contribution Maximum: 0.0817 Average: 0.016	Level Vessel 4 01.Contribution Maximum: 0.0263 Average: 0.014	Level Vessel 7 01.Contribution Maximum: 0.1341 Average: 0.0147	Pressure 3 01.Contribution Maximum: 0.0397 Average: 0.0143	Temperature 1 01.Contribution Maximum: 0.0441 Average: 0.0135	Vibration 2 01.Contribution Maximum: 0.105 Average: 0.0164	Vibration 5 01.Contribution Maximum: 0.0655 Average: 0.0145	Vibration 8 01.Contribution Maximum: 0.0766 Average: 0.016	Pressure 7 01.Contribution Maximum: 0.0672 Average: 0.0083	Pressure 10 01.Contribution Maximum: 0.028 Average: 0.0133



Thanks!

Questions & Comments