Hi Sulav,

A wonderful example of how data may increase operational efficiency is how you used predictive analytics for equipment maintenance. I would like to recommend Condition Based Monitoring (CBM) as another approach that might also work in this situation.

Alternative Method for Equipment Maintenance: Condition Based Monitoring (CBM) uses sensors to continually monitor an equipment's state in real time and evaluate its performance. CBM focuses on current, real time data like vibration, temperature, and pressure to determine the precise moment when maintenance is needed, in contrast to predictive maintenance, which frequently uses past data and sophisticated algorithms to anticipate when maintenance should occur.

Why CBM Could Be Better: CBM can be more precise in preventing equipment failures because it responds directly to the actual wear and tear occurring in the machinery. For instance, if a machine starts to exhibit unusual vibrations or temperature increases, CBM systems can immediately flag these issues, allowing maintenance to be scheduled right before a failure might occur. This approach reduces unnecessary maintenance, minimizes downtime, and can extend the life of the equipment by addressing issues as they arise, than waiting for a pattern to emerge from historical data.

CBM is specifically beneficial in environments where equipment is mission critical, and any downtime can lead to significant operational losses. By focusing on the real time status of the equipment, CBM ensures that maintenance is done exactly when needed, neither too early (which can be costly) nor too late (which can lead to breakdowns) (Ali & Abdelhadi, 2022; IBM, n.d.; UptimeAI, n.d.).

Additional Comments: Your use of predictive maintenance is highly effective for long term planning and understanding trends in equipment behavior. However, integrating CBM could further enhance your approach by adding a layer of real time monitoring, making

maintenance even more responsive to actual conditions. This combination could provide the best of both worlds: the foresight of predictive analytics and the immediacy of condition based monitoring.

Great job on your post, and I look forward to further discussions!

All The Best!

Avinash

References

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