Asset Management Strategy for Renewable Assets using IoT and AI/MI

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Abstract
The quest for developing an optimized asset strategy has been the ‘holy grail’ that asset intensive industries have been striving to make a reality for decades. Balancing risk and cost is a never-ending endeavor that constantly battles with evolving business needs, dynamic asset operating contexts, and smarter assets due to increasing numbers of new sensors and monitoring capabilities. Often, we find that our own work processes, aversion to change, and lack of trust in technology often minimizes our ability to embrace these variables, and move beyond the old mantra of ‘this is how we have always done things’.

Introduction
Over the past couple of years, the industry has seen exponential advancements in condition monitoring sensors, cloud computing, and an ever-growing quantity of ‘big data’ available for analysis. This has led the way for artificial intelligence (AI) and machine learning (ML) to not only turn into the latest buzzword, but to become the ‘magic bullet’ to solve many inherent risk drivers for an asset intensive organization. The problem with this perception, is that without a good foundational strategy in place, most AI/ML (or advanced analytic) initiatives will not deliver the expected results. If the correct strategy is defined, implemented, and sustained, the value delivered to an organization can include: resource efficiency, reduced operating costs, failure avoidance/prediction, improved uptime, and overall reduction of asset life cycle costs.

Embarking on an advanced analytics initiative may seem like an overly daunting technical and mythical venture, however, most organizations have the key building blocks in place to deliver value, if a proper strategy is implemented. The strategy should consider key questions and foundational building blocks such as:

- **Definition of Business Goals** – Why does your organization really want to adopt AI/ML? Is it because the business sees the benefit of the investment to manage risk and solve a problem, or is it because it’s the ‘new thing’ that everyone else is doing?
- **Alignment on Expectations** – AI/ML is not a panacea where bad data is put into a magician’s hat, and suddenly earth-shattering insights appear. Problems will be identified in work processes, data gaps will materialize, intended use case plans will evolve or even lose viability continuing, and the development of AI/ML models takes time and many iterations before an insightful product is delivered.
- **Data Cost, Availability, and Quality** – Big data is being generated through condition monitoring sensors, transactions in our EAM systems, and the results of testing/inspections
reports. Is this data accessible for use in a format that data scientists can leverage? How do you plan to handle missing/poor quality of data sources? How does your organization manage these voluminous sources of data and the related cost of storage and processing? Is there a semantic approach for historian tags/asset ID’s to enable cloning or scaling of models across your asset fleet, based on operating context?

- **The Right Tool for the Right Job** – Are you trying to run before you walk by diving into prediction models that require good data, knowledge, and understanding of biases before you have performed basic data exploration? Does a simple dashboard of data visualizations deliver fast and meaningful value versus a 6-month model development process to solve a single problem? Does the problem you are trying to solve have systemic latent root causes that are not solved by data or automation alone?

- **Engagement of the Right People** – AI/ML cannot be developed in a room by data scientists without the engagement of the right subject matter experts to guide the statistical modeling and interpretation of results. Is there alignment and bandwidth for the proper resources to support the work? Do you have data scientists available to support the project, or will you rely on staff augmentation? Is there a stakeholder from the leadership team engaged to drive delivery of results, adoption, and spearhead improvement activities resulting from the model development?

- **Change Management** – Is there a clear plan to educate the organization on AI/ML and the importance of data? Are the right people involved in the development of the analytic solution to aid in ownership and adoption of the output? Is the model output in a consumable and actionable format by the intended audience? Does the asset management work process in your organization enable the inclusion of advanced analytic solutions?

Long-term success and adoption of the program will not be sustainable unless you consider all the above items when starting an advanced analytics initiative in your organization.

**Biography**

Gavin Linderman leads the AES Corporation’s Global Center for Performance Monitoring and Analytics with responsibilities in North America, Mexico, Central America, Caribbean, South America, and Eurasia. He oversees the analytics, monitoring, and diagnostics for solar, wind, and thermal generation assets to ensure equipment reliability and effective/efficient operational performance.

Prior to joining The AES Corporation in 2020, he spent the first half of his 22-year career in multiple operations, maintenance, and reliability engineering roles within the automotive, steel, and utility industries. He subsequently spent 7 years as the Global Performance and Reliability Leader for a large chemical (plastic) manufacturer, focused on the execution of optimized asset design, maintenance, and asset analytics. In addition, Gavin spent multiple years a senior consulting manager with a major business advisory firm, orchestrating large software implementations and operational excellence initiatives within the Oil and Gas industry.

Gavin completed his MBA from Bowling Green State University and his undergraduate degree at DePaul University.