Discussion Topic Series

The following is a discussion regarding leading indicators and their place in safety data. In simple terms, this document outlines the underlying purpose of the EHS Analytics platform and the changes we believe will result in a better and higher use of safety data bringing entire sectors together to tackle the challenges of safety improvement.

The Holy Grail of Safety Data.

Organizations are constantly looking for new preventative measures to keep their employees safe, and in the hunt for these measures they turn to safety data to guide them. This safety data may pertain to something that has happened (lagging) or data that suggests something might (leading). We refer to these as lagging and leading indicators when we try to use them for prediction and trend analysis. These indicators guide decision making in the development of safety strategies in an organization – they are essential.

Lately, leading indicators are all the talk and, in some ways, they are the holy grail of safety data. The reason for this is that leading indicators are predictive. Whereas it is easy to capture an incident (a lagging indicator) because *it happened*, it is very hard to capture data that might indicate something is *going to happen* (a leading indicator).

What is a leading/lagging indicator?

To explain leading and lagging indicators through analogy, consider a company's quarterly financial reports. These reports are a lagging indicator as they are a clear indication of the company's track record in the past. We all know of the disclaimer that "a company's past financial performance is not necessarily indicative of future performance". We all look for leading indicators. An example of a corporate leading indicator could be the identification of downward trend in the average age of a company's employees. In some situations, this may indicate a positive change in 'progressiveness' or in other situations it could indicate a serious erosion of knowledge and experience. Depending on the market this leading indicator could suggest better or worse future performance – making it a very useful leading indicator.

In safety, lagging indicators directly measure any instance *where safety protocols faltered* (including injuries, environmental damage, near misses, etc.) You can evaluate what happened and put in measures to prevent it from happening again. Leading indicators are different and measure observations regarding the day-to-day work environment in the **lead up** to *where safety protocols faltered*.

We are looking for that specific trend– either behavioral or environmental - that suggests an increased likelihood of something happening. Consider an organization that decreases their training frequency - perhaps it starts to let training schedules slide. Statistically, this trend increases their risk of a future incident. Leading indicators, therefore, are

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proactively safeguarding employees before an incident occurs.

Presently, the progressive safety culture in large- and medium-sized organizations has significantly decreased the incident rate. This is great except it leads to the problem that there is less data to work with, making it increasingly hard to glean insights in safety.

Leading indicators could be nearly infinite and require a relational analysis between certain types of data to establish their efficacy. Leading indicators are dependent on a statistically robust, broad, and high frequency data set.

Companies seem to acknowledge this and the result has been a fairly broad effort to expand internal data collection to improve the development of leading indicators and better safety policy. This is a valuable change but it will not result in the improvements that are hoped for.

The development of a leading indicator is iterative and dependent on incident data. I'm going to repeat this: **leading indicators cannot be determined without incident data**. And, because incident data has trended down, it is harder to independently determine leading indicators.

To deal with the declining incident data and increase the power of data collection, **companies within an industry need to begin to cooperate**. Shared data and collaborative work harnessing a larger data set will provide new leading indicators that otherwise wouldn't be found.

Leading indicator development also requires new behavioral and environmental data collection to establish new correlations to incident data – something that will evolve when sector peers work together using associative data.

This iterative, collaborative process encourages new information capture which in turn persuades and suggests the collection of new or more specific high frequency data.

This refinement process harnesses a greater pool of talent through collaboration which accelerates the development process and encourages a more conscientious, safer culture. **One organization and one safety manager cannot accomplish this alone**.

There is an identifiable recent phenomenon of safety improvement reaching a plateau. It can be seen across industries, provinces and even in other countries. The low hanging fruit of safety improvement has been consumed. Safety needs an evolutionary step.

High frequency, multi-organization data is the future and is the only way to perform accurate trend analysis in an effort to create a new safety ecosystem.

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