

# Implementing a Digital Strategy for Improved Environmental, Health and Safety Performance

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# Executive Summary

Senior executives and environmental, health and safety (EHS) leadership are challenged today with improving EHS performance with fewer financial and human resources. A current trend in the professional EHS community is to focus on using data in advanced analytic models to gain meaningful insight that drives change and performance improvements. The issue with this approach, however, lies in the barriers to performing advanced analytics successfully—such as the methods in which data is captured, and its structure, type, and quality. To produce sustainable improvement, Accenture recommends implementing a Digital Strategy for EHS Performance. This structured collection of **high-quality data** and **advanced analysis** can help companies produce actionable EHS insights in **real time**.

# The Challenge

The health and safety of individuals and environment stewardship of companies is a top priority. Therefore, improving EHS performance is a mission-critical mandate. Additionally, EHS systems are increasingly leveraged in industrial turnaround activities to optimize project schedules, productivity, and contractor costs—which produces a measurable return on investment (ROI). However, the challenge to realizing the EHS and operational benefits lies in the ability to collect **high-quality** data and perform **advanced analysis** to produce actionable insights in **real time**.

It is imperative that companies move beyond traditional EHS data reporting. Which for many, consists of monitoring key performance indicators. But monitoring leading and lagging performance metrics does not provide an understanding of true operational risks or the insights to improve performance.<sup>1</sup>

In our view, companies struggle to find the experience and capabilities to perform advanced analytics. As a result, the environmental, health and safety area is hindered by the inability to identify and mitigate risks and inefficiencies.

<sup>1</sup>Campbell Institute; *Transforming EHS performance measurement through leading indicators*—Executive Summary; National Safety Council—2013



# Understanding the Issues

Advanced analytics requires high-quality data structured for multi-dimensional analysis. As such, the issues relating to data analysis are: structure, type, and quality, depicted in Figure 1.

## Data Structure

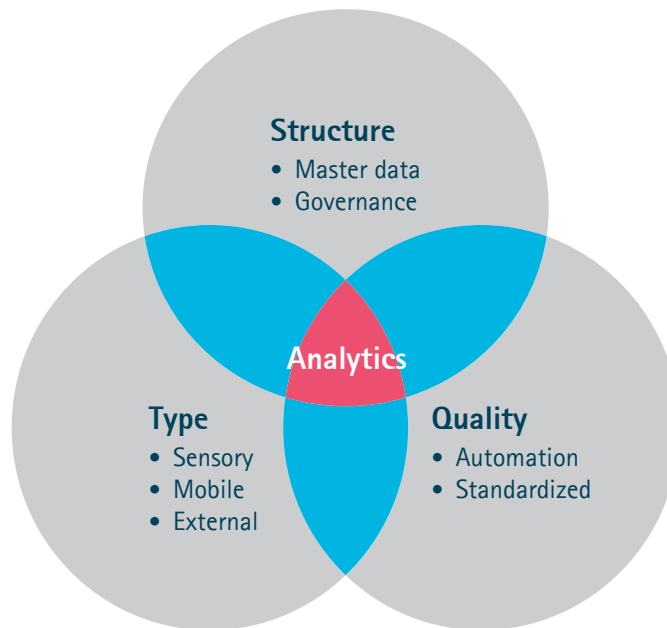
The **Master Data** of a company is the critical factor in establishing an overall data structure and governance process, and is the backbone of an analytic data model. Master Data is used across business functions (e.g., Finance, Human Resources, and Business Operations Units) and must be agile enough to respond to organizational changes.

In lockstep with agility, the data too must have a formal **governance** process. Data must be managed to keep historical data relevant while allowing for the use of new data. Some companies may add, delete, or deactivate segments from the Master Data structure, but this leads to data gaps. Another issue is that to maintain the integrity of historical data, its previous structure must be fitted into the new structure. All the while, the impacts of any changes need to be assessed across all business functions using the Master Data.

## Data Type

When companies grow through mergers and acquisitions (M&A), they may acquire duplicative or incompatible EHS management systems. Merging the differing Master Data sets and data types collected from similar applications can be difficult. And a new underlying data structure for the new common data set must be developed prior to integration or additional data quality issues will be created.

FIGURE 1. Data structure, type, and quality overlap for advanced analytics.



Recently, the **Digital Revolution** has resulted in the ability to collect data from new sources—such as remote sensory equipment, mobile devices, and external sources. These data streams represent significant value when properly selected and structured. However, if the data is not relevant to the end analysis being performed, or if it is unstructured, it results in additional “noise” to the data set—creating distraction from the true message being sought.

## Data Quality

Respondents from the Energy industry to a data-related survey cited “format, completeness and accessibility” as key issues affecting data quality.<sup>2</sup> Companies still employ outdated methods for data capture, such as the **transcription** of handwritten forms into EHS management system databases. This technique is heavily flawed because of illegible writing, human error in the data entry process, and checkbox values being improperly selected. Each time data is handled, it is a proven probability that data errors increase. This contributes to a lack of accountability for the quality of the data.

Also, the **timeliness of data** capture into an EHS management system is essential. Consider that handwritten data remains static until it is entered into the system. But, if data is missing from the form and if significant time has elapsed since the point of capture, the task of connecting with the employee to recall missing details is ineffective.

## The Impact of “Bad” Data

These issues limit the ability to accurately assess operational risk and inefficiency, and identify mitigation measures. They also limit the ability to identify and implement **new and meaningful leading performance indicators** that are similar to the widely adopted Total Recordable Injury Rate (TRIR) and Days Away from Work, Restricted or Transferred (DART) Rate lagging performance indicators—which allow for performance comparison between industry peers. But if a company is affected by the data issues discussed thus far, the ability to identify new, unique, and relevant leading performance indicators will be ineffective.

<sup>2</sup>Miers, Jeff; Donaldson, Kevin; Ramani Senthil; Holsman, Richard; *Digitizing Energy—Analytics—Powered Performance—Section 1.1 Survey reveals barriers to better business outcomes; Accenture—2013*

# Opportunities for EHS Improvement

Companies seeking to become top performers must embrace a **Digital Strategy** for improving EHS performance. The goals of a digital strategy are to incorporate the capabilities to collect higher quality data, the technologies to standardize and automate data collection, and the resources to perform advanced analytics.

The initial step toward a Digital Strategy is to review available data and determine its capability to be used in an advanced analytics model.

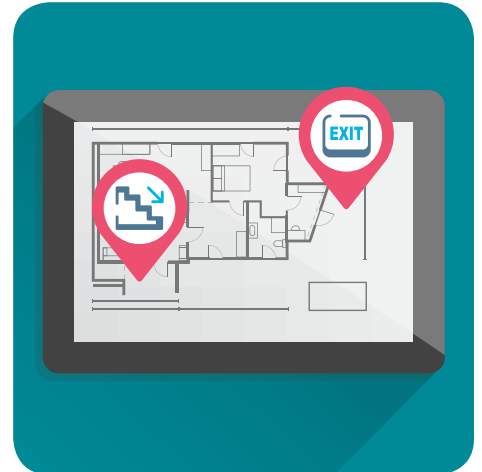
A specific opportunity to improve data quality and structure can be found in the outfitting of **Digital Workers** with new technology that automates and streamlines data capture. Workers are provided with sensory equipment, interactive hardware, and mobile applications that allow for real-time data collection and decision-making. Examples of new automated technologies are:

- **Mobile apps** that can be run simultaneously on tablets in the field, allowing for multiple data streams to be collected at the time and location of generation. The data capture process is streamlined with benefits for multiple business functions.
- **Sensory equipment** to read worker location and concentrations of oxygen, hydrogen sulfide and the lower explosive limits of chemicals in atmosphere. Location sensors can also provide data to prevent access to unauthorized work areas for workers and equipment, and data can be used to validate worker productivity, equipment use and associated costs.

- **Pervasive wireless** is another solution that enables the collection of high quality data. In fixed facilities with complex infrastructures, such as manufacturing plants and production facilities, the ability to remain connected to digitally equipped workers and equipment is hindered by the structure itself. Installation of a local and secure pervasive wireless mesh network can overcome this critical barrier and support the real-time collection, storage, and analysis of data.

By improving the processes for data capture and underlying data structure, a higher quality data set enables **advanced analytics**. These analytic models produce relevant information, provide operational insight, and are scalable for broader enterprise analysis or deeper individual business unit analysis. Advanced analytics can be applied to EHS data to identify operational risks for targeted action and improvement. However, care must be taken when developing an analytic model.

This is, in a manner of speaking, a **predictive capability** and trying to predict an EHS incident with specificity can be a difficult and risky task of its own. For example, changes in leadership and company priorities can impact the type of data being generated. Thus, an analytic model's ability to reliably and consistently assess and identify operational risks is therefore impacted, and the analytic model will need to be recalibrated as the EHS culture evolves.



# How Accenture Can Help

Accenture has deep experience and capabilities (see Figure 2) helping our clients implement a Digital Strategy for Improved EHS Performance. For example, Accenture has proven experience with:

- **The Accenture Life Safety Solution** – which combines a pervasive wireless network with real-time sensory equipment. This solution has been implemented in petroleum refineries for major oil and gas companies, and has enabled real-time monitoring of employee and workplace safety.

- **Advanced analytic capabilities** – When modeled correctly, real-time data results in easy-to-understand real-time metrics— which is essential for providing EHS leadership with information to make faster, better decisions based on data. For example, after implementing real-time sensory equipment for a global mining company, Accenture created highly visual "dashboards." Supervisors were able to monitor employee, contractor, and asset position in real time. Other customized alerts notified management of expired training, potential for worker fatigue, and access to unauthorized areas.
- **Accenture EHS resources** – Our global network includes subject matter experts in Environmental Compliance, EHS Management, Sustainability, and EHS Management Systems implementations. We have strategic alliances with leading EHS Management System vendors to help our clients identify and select solutions for present and future needs.

Our clients have used Accenture resources and solutions to improve EHS performance during routine facility operations and turnaround activities. Some benefits realized are:

- 95% reduction in emergency response times
- 3-fold increase in the number dangerous gasses monitored
- Automated alarms signaling atmospheric monitoring thresholds
- 6-figure cost recoveries (estimated) due to lessened contractor leakage
- Reduced days for turnaround projects leveraging mobile technology to optimize work process and time on tools.
- Installed communications infrastructure now available for future turnaround projects and can be used by multiple other business functions

FIGURE 2. Accenture has resources and capabilities in EHS strategy, digital, technology, and operations.



# Conclusion

It is Accenture's view that senior executives across industries can realize EHS and operational benefits by collecting **quality** data and performing **advanced** analysis to produce actionable insights in **real time**. Our diverse capabilities and experience help our clients develop innovative solutions to address today's operational challenges while being agile enough to deliver value as the company evolves over time.



To learn more about Accenture  
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