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When digital transformation hits all four sustainability buckets

Sustainability is emerging as a critical business topic, as many companies focus resources toward lowering emissions, waste and energy use in their production processes. This important concept can apply broadly to company operations, especially when considering the expansive view of the triple bottom line that measures the impact of company operations on profits, people and the planet.

Sustainability efforts affect four key areas within a processing plant: efficiency, business, talent and safety. While energy sustainability may be a clearly defined goal for some organizations, there are other areas that also benefit from energy-targeted sustainability efforts and vice versa.

Digital tools have been helping with sustainability goals for a great deal of time, since many digitalization efforts have always targeted efficiency improvements. It is not new that digital tools have this value-add for organizations. However, while energy consumption reduction used to be measured solely in dollars, the industry is slowly moving toward more specific metrics about processes and the amount of energy saved. In addition, companies are increasingly focused on reducing waste and discharge from production units, tasks that are more easily executed with visualization and efficiency capabilities of digital solutions.

Most advancements in digital transformation tend to result in tangible benefits across a variety of areas. Processes that lead to reduced energy consumption can lead to more business profit. Processes (like knowledge automation) that promote better employee onboarding or more technical guidance will not only attract and keep talent, but will also help curb unintended manual mistakes on the factory floor. All four buckets are linked through digital transformation, and all four have an undeniable need for increased focus on sustainability.

Process efficiency. For years, technology has had the ability to simulate and predict carbon dioxide (CO_2) emissions for different process options. However, as erring on the "greener" side of business has become the norm, organizations increasingly look for more visibility on important targets and ask for CO_2 metrics on their operating and reporting dashboards. Company executive boards actively ask for this type of process and measurement—they seek measurements that are not necessarily dollar-related. CO_2 emissions related to energy of the process is the most obvious metric, but other efficiency metrics often include factors like on-spec or quality of production. Cutting emissions is important, but if a poor-quality batch is produced, that batch can be considered waste because it is not a valued product and is a waste of both energy and raw material. Any technology that can improve the quality of the products or batches ultimately improves what companies can sell to customers, which, in turn, creates less waste and a more efficient process.

A great example of this is in scheduling tools, which help companies increase efficiency in production planning to eliminate waste further down the road. Scheduling tools can help companies decide when to make which product, based on customer demand, and in which order to make them—resulting in less energy usage and less waste in the production phase.

Digital simulation tools can also drill down into specific emissions that are tracked, correlating certain emissions with various steps in a reaction. For example, digital transformation solutions will help organizations notate specific correlations and will help uncover specific data about each of the processes. This is not something that can possibly be done on a manual level, as so many industrial processes are too complex to track and adjust. Meanwhile, advanced digital tools help workers see the value in adjustments and guide them in how to make them.

Business economics. In truth, profits can often be tied directly to sustainability. Think of the "bad batch" example: processes that prevent producing a bad batch help save money for an organization on the back-end with less waste of raw material.

In volatile industrial markets, making business profitability sustainable is crucial. Another key technology advancement that helps keep businesses more sustainable, from a financial perspective, is reliability software that predicts equipment breakdowns, sometimes months in advance of an unplanned or unforeseen event. This advance warning enables companies to avoid breakdown events and potentially major profit losses in production downtime—some that could add up to a million dollars in lost profits per day and can lead to increased emissions and discharge.

Predictive maintenance is not just a digital transformation tool, helping plants with operational efficiencies. It has a direct impact on an organization's bottom line by keeping machines running to the limits of their performance while avoiding maintenance and capital costs from unexpected failure. Reliability software in the maintenance process is a value creator in that sense. It knows the limits of equipment, so it enables organizations to get the most out of them from a production

standpoint, knowing they are not going to cause damage or breakdown.

Safety and talent. Along the vein of predictive maintenance, ensuring advanced warning of equipment or asset malfunction or breakdown also helps limit the likelihood of unsafe plant events that can put workers' lives in danger. This is a central reason why it is important to have a clear view into the health of a plant and its assets in real time. Why operate with an "unknown" factor that could potentially cause harm to people, when technology advancements can potentially remove that factor from the equation? The visibility and data that modern technology provides gives companies a fighting chance to adjust their operations in ways that will curb danger.

Ensuring the safety of factory workers, along with the surrounding community, is paramount, and technology that leads to more plant process reliability is a key factor in making this a reality. This also blends into the topic of talent sustainability. Making factory jobs safer, and better protecting workers through increased plant reliability, make industrial careers more attractive to young talent.

In addition, there is no denying that we are facing a serious talent gap in the industrial world. Over the next decade, there will be 2.4 MM unfilled jobs in the manufacturing sector.[1] Apart from technology making plant work safer, it is also helping improve workflows, especially through operator training simulations, allowing fresh hires to get a feel for their responsibilities, plant operations, and the different and challenging circumstances that may arise in those operations, in a totally simulated setting. It allows them to grow and learn and make mistakes in a closed environment that does not have real-world impact. Using technology to better train talent is a huge value-add to a company, but it also helps make the work and onboarding processes easier and more attractive to fresh talent.

In addition, software that helps guide talent to make better decisions and be more efficient in their work completely changes the nature of these industrial roles, bringing them into the modern age and removing a layer of complexity that has always existed in the factory, from a historical perspective. The importance of linking sustainability concepts to worker satisfaction cannot be underestimated. For example, at a recent industry event, Lyondell-Basell's CEO, Bob Patel, highlighted this importance in his workforce noting, "Ten years ago, employees asked 'how do I get ahead?' Today a new employee asks 'how do I make a difference.'" Digital technologies are an important element in helping employees achieve their full potential. **HP**

LITERATURE CITED
[1] Deloitte Insights, "2018 skills gap in manufacturing study—Future of manufacturing: The jobs are here, but where are the people?" online: https://operationalsolutions.nam.org/mi-skills-gap-study-18/

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