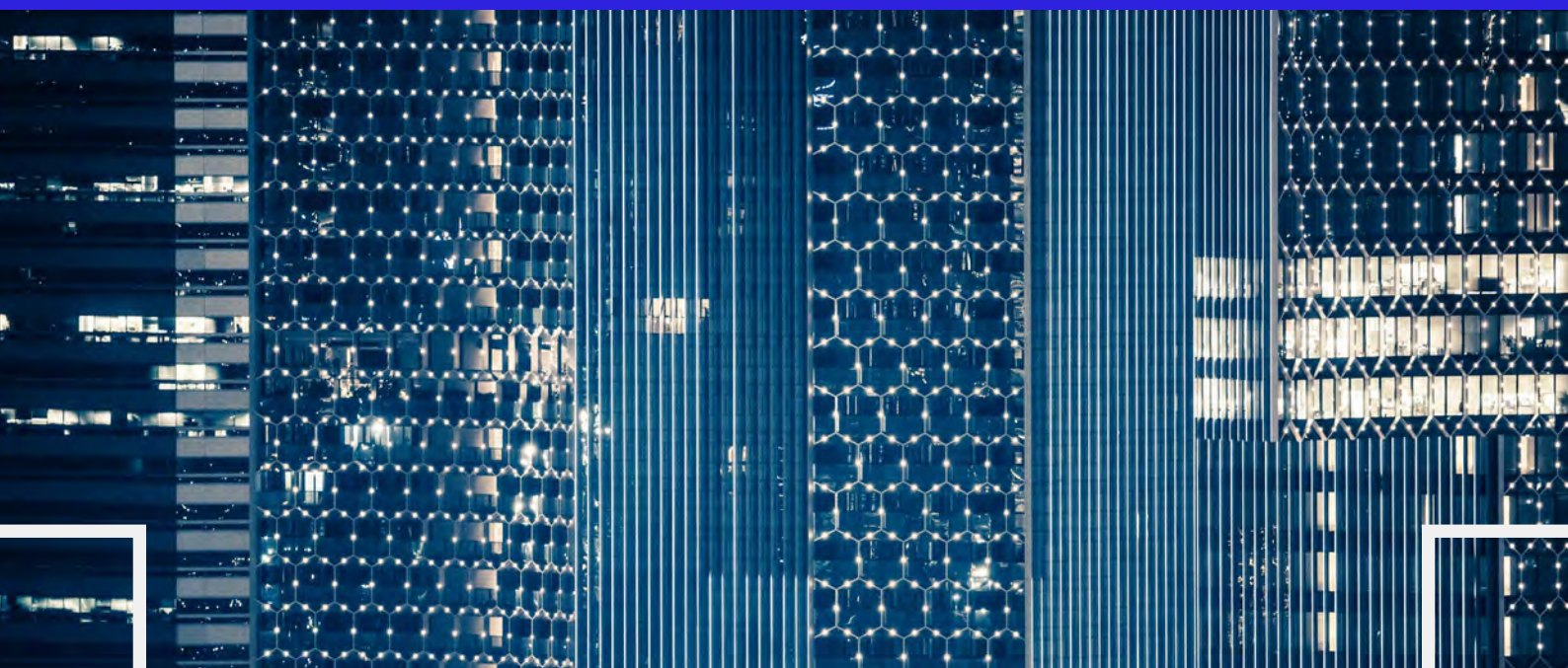


COPPERBERG

Achieving Higher Production Efficiency Through Data-Driven OEE



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Introduction

Hamstrung by COVID-19's far-reaching impact on the global manufacturing sector, multiple organizations were left with no choice but to close facilities or inescapably operate their units at a limited capacity.

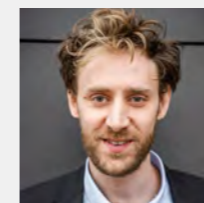
With conditional lockdown relaxations coming into effect, manufacturers have started to reopen plants and resume their daily operations — still at reduced capacity, though. Yet this doesn't mean that plant operators will experience a prolonged production hiccup.

As industry players aim squarely at optimizing productivity through data-driven OEE (Overall Equipment Effectiveness), they are likely to keep production from grounding to a recurrent halt.

There is no lack of clarity about OEE's palpable importance in modern facilities. This [globally accepted standard for measuring manufacturing productivity](#) indicates how efficiently industrial equipment is running and patently locates potential hindrances in the production flow.

A performance measurement metric that persistently underlines the plant's visible and hidden productivity losses allows manufacturers to eliminate bottlenecks before they brusquely morph into sources of production downtime. In fact, this indicator goes beyond identifying underperforming equipment and inefficient production plants. It also enables plant operators to set achievable targets for improvement while robustly measuring the results of daily production activities.

But there is a precondition for achieving a world-class OEE score and yielding all the benefits that come with it — namely, gathering and acting on timely data. That is to say, the palm-iest OEE-based initiatives are primarily data-driven.



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The first step towards greater production output is, therefore, using relevant data to make intelligent decisions and build a foundation for continuous plant availability, performance, and quality optimization. —

Setting Up a Foundation for Greater Production Output



With the plant's production efficiency hanging in the balance, operators must upend their traditional understanding of optimizing OEE to achieve significant improvements in machine utilization — which is sequentially expected to enrich manufacturing productivity.

An elaborate data-driven plan that is charted to collect real-time information from each plant and machinery operation will better position industry players to gain unequaled visibility into their production performance. What follows, in response to this data-based procedure, is not incidental but decisively fundamental to the growth in manufacturing production.

Having access to detailed OEE data allows operators to make preventative decisions with peerless precision as they receive a timely overview of the production environment and swiftly eliminate incorrect assumptions. OPTIWARE's clients [echo this sentiment](#) and explain how being able to access the right information:

"The system generates a well-stocked database of statistics. We therefore have a good tool to follow-up on disturbances that present the information in a quick and easy way."

Getting instant access to OEE scores is essential in developing a baseline for data-driven production and facilitating greater efficiency in equipment utilization. When it comes to routinely keeping production effectiveness at the highest level, other protuberant factors are also at play. Each OEE result is heavily dependent on accurate, easy-to-understand, and actionable data — not just *any* type of data. All the data collected and used for reliable OEE calculations accurately measures the availability, quality, and asset utilization in order to provide relevant suggestions that help plant operators:

- Measure their production flow to minimize the inefficient use of machinery and promptly unveil less visible disturbances
- Make quick (yet better-informed!) decisions for accelerating productivity gains while objectively increasing resource efficiency

Habitually collecting data is mandatory for improving the plant's OEE value. But merely *gathering* production information isn't necessarily a sustainable practice. Enriching production performance is a matter of meticulously *analyzing, understanding, and acting* on the well-grounded data that underpins the OEE index to create a solid foundation for continuous improvements. —

Integrating OEE Data Within the Manufacturing Environment



OEE ratings provide a first-class framework for punctually improving the productivity of an industrial manufacturing plant, but concerns exist.

It is common for organizations to handle a growing number of independent plant operations. OEE is a metric that smartly exploits various pieces of equipment data or production line information to provide a complete evaluation of their performance. However, all the data-driven insights used by plant operators in formulating cogent improvement measures may spark worries of a setback in proper analytical decision-making and simultaneously, productivity growth. The concerns are rooted in the analysis of multiple and diverse data sources — which, if not properly structured, could distinctively obstruct the desired efficiency outcomes.

Harmonizing data for analysis is the surest path towards nimble — and most importantly, *valid* — OEE calculations.

As operators logically integrate plant and machinery information of varying formats across their manufacturing environment and key metrics, they all have access to a cohesive and actionable OEE dataset. This unified interface allows for capturing indispensable manufacturing intelligence that leads to well-founded decision-making procedures.

What's more, industry players have the opportunity to examine fact-based evidence of their production efficiency as they can easily obtain historical perspectives of previous OEE efforts. When all the data collected about past events is consolidated into a usable repository, manufacturers will better understand the context of their OEE score and provide truly relevant and pertinacious reports.

Perpetuating a high level of operational data integrity in all the populated reports and databases also aids manufacturers in managing sudden, yet calculated, production changes while maximizing OEE ratings. Concurrently, operators can reclaim the hidden capacity of their manufacturing plants. The performance records that are being stored in readily accessible databases can proactively increase the organization's capability to undertake improvements in efficiency and profitability — but without acquiring new assets. —

Maintaining Full Control of the Plant's Production Growth Rate



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Content Writer
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In the wake of COVID-19, data-driven OEE provides a perfect response to the concerning production setbacks that recently impacted the manufacturing sector.

OEE ratings have long since *only* been thought of as a means to accurately measure the effectiveness of industrial equipment or production systems. Driven by an attempt to take immediate corrective action, many plant operators are now being guided by automatic OEE data recordings to reduce losses and completely rebuild their production landscapes through meaningful decision-making.

Automatic tools are gradually eclipsing time-intensive manual data logging as **top-tier technology that enables OEE monitoring** rapidly collects reliable information needed for improvements with little to no effort from the plant operator. Even more remarkably, such tools empower manufacturers to accelerate industrial production growth and maintain process stability over time. —

Interview with Kurt Rowan from Aptean





Kurt Rowan
Solutions Consultant
Aptean

What has been the biggest impact of Covid-19 on plant operators?

Whilst Covid-19 has intensely affected manufacturers with uncertainty from both supply and demand, the safety of its employees in the workplace undoubtedly remains one of the biggest threats. As a result, operators on the shop floor have since experienced a number of apprehensions, and are looking up to their plant leaders to help mitigate risk.

In the short-term, due to the nature of the virus the top of these concerns for operators is simply the need to incorporate physical distancing and cleanliness on the shop floor. To cater for this, many manufacturers have looked to change their processes in order to minimise contact, particularly in communal areas of the plant. Typical approaches that I've certainly witnessed from the field include; modifying shift patterns to reduce the interaction and number of people in the facility at any given point in time right through to creating a structure where operators are assigned to less machines, but have more responsibility to complete additional tasks i.e. maintenance and cleaning — all with the aim of reducing any potential cross contamination.

Though initiatives such as these have been a key element to keep operators safe, it is certainly not the long term answer to cater for this 'new normal'. This is because an operator's sense of inclusion and access to two-way communication has proved vital to boost morale and keep motivation levels high. As you can imagine, low morale and motivation is not only going to be detrimental to an employee's wellbeing, but it's also going to have a big effect on productivity. As a result, manufacturing executives have turned to software systems that will enable them to drive the communication, collaboration and productivity on the shop floor **remotely**.

How is Aptean OEE helping manufactures cater for this 'new normal' during these last couple of months?

Aptean OEE can be accessed via a web based browser or a mobile app allowing information to be made available at the end of your fingers tips when and where it's needed across the organisation. This has become invaluable through these last few months as production management can run production **without having to be present on the shop floor**. Specifically, Aptean OEE's real-time 'Factory Overview' dashboard has given production management a close grip of how production is performing against target across the entire site. Simple colours are used to highlight areas for attention, enabling processes to be managed by exception remotely.

What's more, whether you're viewing Aptean OEE through a large screen in production, laptop, mobile phone or computer - the user interfaces and user experiences have all been aligned accordingly to ensure the awareness of real time production state is created in a way that **unconsciously drives competitive engagement and motivates shop floor teams**. A great example is Aptean OEE's 'Visualise' templates which create awareness of actual vs target performance against machines, products, runs and shifts. These templates are often projected on large walls in production areas or even featured on large TV screens in breakrooms allowing teams to compare performance against other teams within the same shift period. Not only has this been key to allowing manufacturers to maintain competitiveness and inclusion between the teams, it's a well-known fact that once you shine a light on performance, productivity always improves as a result.

In addition, communication capabilities within the system have also been key to ensuring operators can request support remotely to relevant shop floor personnel without having to leave their assigned area. A great example of this is the

Andon functionality where operators can request help at the click of a button. In turn a push notification can automatically be sent to the relevant user's phone creating immediate awareness of the situation.

Furthermore, Aptean OEE gives full insight into real time plan attainment giving everybody from the top floor all the way down to the bottom floor visibility into the actual work in progress of a specific production run at any point in time. This has given manufacturers the additional agility that's needed on the shop floor to stay responsive to unpredictable shifts in demand that are commonly being experienced in this current climate.

Why is OEE such an important tool to help executives achieve their business priorities today?

Asides from keeping employees safe, amongst the top priorities for businesses is to increase revenue, decrease costs and/or reduce risks. With the pressures from the macro environment of today, these priorities have only been amplified.

A common misconception is that OEE is perceived as purely a manufacturing KPI, and as a result, the correlations between OEE and the financial performance of a business are often overlooked. However, there is strong causation. In fact, even a small uplift in OEE can present the biggest opportunity to businesses that are wanting to cater for an increase in sales revenue, drive down costs and/or achieve a reduction in risks.

Increase Revenue

OEE is a calculation that's expressed as a percentage (Availability X Performance X Quality) that gives manufacturers full insight into their actual productive time against their

available, planned production time. It takes into account the 6 biggest losses of production; set up & adjustments, breakdowns, reduced speed, idle time & short stops, production rejects and start up rejects.

In short, each of these losses can be converted into wasted time. If identified, that wasted time holds a considerable opportunity cost of producing additional product. OEE is the tool which gives manufactures the ability to reveal this wasted time so that adjustments can be made, thus, allowing that time to be utilised as productive time. Catering for additional customer demand to increase revenue through improvements in OEE is a great attraction to manufacturers as they are able to achieve this goal without having to invest in additional resources and time. As you can imagine, this works out as a much more cost-effective approach than having to invest in new machines or sites in order to cater for that increased demand.

It sounds simple, and it is. That's if you have the right system in place of course. Without the right system in place, manufacturers measuring OEE in a manual setting cannot effectively measure those 6 biggest losses and so will inevitably have gaps in performance where that 'wasted time' goes unaccounted for. As a result that valuable spare capacity that businesses are looking for to take on those additional sales remains hidden.

Reduce Costs

What's more, that wasted time does not only have an opportunity cost of producing additional product, it's also expensive in its own right. In fact, manufacturers are paying for every minute of lost time in the form of labour and energy costs. I often ask manufacturers, how much does your hourly energy and labour costs add up to? And what were your production figures for last year? It's hard to not get excited when you realise the potential.

For example; let's say John, Production Manager of *Company 1 Ltd* ran his production plant for 5000 hours last year. Although in a perfect world, the theoretical maximum output of John's machines would have given him 10,000 units, he averaged 50% OEE and so ended up producing 5000 units. His company set objectives for him next year to save £250,000 in production costs but to still maintain an output of 5,000 units.

After working through the numbers with John, we calculated that an uplift of just 5% OEE would enable John to cater for the same 5000 units, but using 455 less production hours, allowing John the option to turn off the overtime shifts. What's more, with a variable overhead of £550 per hour, those 455 hours translated to a £250,000 saving on the bottom line.

Although a conservative example; this illustrates the importance of OEE and its substantial relationship it has on the bottom line of a business. As with increasing revenue, manufacturers should first look to identify opportunities to improve OEE as means to reduce significant costs.

Reducing Risks

Manufacturers who are measuring OEE overtime effectively, and have access to the historical information learn valuable insights on the relationships between the machines, products and people. This makes them more predictable, and helps to mitigate risks.

For example, if I have evidence that I can achieve 'X%' OEE when 'shift A' run 'product B' on 'machine C' at 'X speed', I am much better able to forecast the material usage and product turnaround. Not only does this help to reduce inventory carrying costs, but improvements in OEE can also help to streamline a business's order to cash cycle and avoid both demurrages and unsatisfied customers — as more products go swiftly through the manufacturing process on time, and in full.

What are some of the benefits of using Aptean OEE?

Firstly, Aptean OEE is an out-of-the-box production monitoring solution that's been developed over the last 20 years to give manufacturers complete visibility into their production opportunities so that a **lucrative performance uplift** is achieved. It's a standardised solution, so regardless of the types or ages of machines, or what you're producing, what you're going to see in one plant with Aptean OEE, you'd see something very similar in the next plant. Not only is this the key to provide a single platform of truth on the shop floor so that it can be used to form the basis of your continuous improvements, but as it's out-of-the-box, it can be installed quickly. The advantage of this is that you're going to get much faster time to benefit with the system. For example, customers with Aptean OEE are getting into the analysis phase of their data in a number of weeks, enabling them to take action on production opportunities and ultimately build a **fast ROI message**, much quicker than you would do with the traditional MES vendors that have to be built from the ground up.

To ensure information is collected in a standardised and consistent manner so that decisions can be made based on the **facts** of the production, Aptean OEE connects directly to the automation and control layer, thereby removing any unaccounted for time. Recordings of the machines performance is logged electronically down to the millisecond, speeding up the data capture process so that everybody has full visibility into real-time production state. Operators can understand how their production machines are running, shift supervisors can see how their group of operators are performing, and production management can view the entire facility as a whole. Performance can be assessed upon multiple production parameters, and acceptable conditions can be set so that when production is sub optimal, everybody within the chain of command can be alerted in real time —

whether that's through a push notification on their phone through to a large screen on the production floor. Accountability and urgency is created, and as a result; adjustments to production are made in the moment, **preventing costly and prolonged losses from occurring.**

In order to look at data **over time** effectively, Aptean OEE contains robust packaged reporting and a business intelligence layer called Analyze — offering strong flexibility as to how end users can consume their production information. As the reporting is out-of-the-box, data prep is reduced down to a couple of clicks, freeing up resources time so that no more time is spent querying data and the equivalent time can be spent focusing on the value added activities such as driving the improvement work. A complete overview of machines performance within the plant can be evaluated by being able to track back to the identifying root causes of production losses against the parameters that were in place at the time such the as the products, runs, and shifts. Correlations such as this can be made on multiple levels, and the opportunity cost of fixing issues can be clearly identified to **improve OEE.**

Aptean OEE supports different time zones, caters for 17 different languages and has full integration touch points to third party ERP and EAM solutions making it a first choice for enterprise manufactures who are looking for a seamless flow of information through their business to support **single to multi-site installations.** What's more, global definitions of OEE and other performance metrics can be defined, giving production management the ability to benchmark performance, set valid KPI's and measure progress effectively across the entire plant network. —

About



Aptean is a global provider of business-critical and industry-specific software solutions. Aptean's specialized solutions help address the unique challenges facing process, discrete manufacturing and distribution companies. More than 4,500 organizations in more than 20 industries and 54 countries trust Aptean's solutions to manage their operations. (Optiware was acquired by Aptean in 2019.)

Aptean OEE

Aptean OEE is a state-of-the-art production monitoring solution for single- and multi-plant manufacturers. Designed to provide a complete picture of your production effectiveness, this solution helps you identify the sources of loss, as well as areas for improvement. With a strong focus on production follow-up and optimization, OEE builds a solid foundation for your continuous improvement process.

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