



Your essential guide to

OPTIMISING ASSET PERFORMANCE

with Simon Carr



**SHARING IN
GROWTH**
Results driven. Results proven.





SIMON CARR

BUSINESS TRANSFORMATION COACH

OPTIMISING ASSET PERFORMANCE: BEYOND 'SWEATING YOUR ASSETS' TO ACHIEVE TRUE OPERATIONAL EXCELLENCE

The term 'sweat your assets' is familiar to many and is credited to Ray Kroc in the 1970s, regarding his work with the McDonald's franchise in the USA. Clearly there are many aspects to the success of McDonald's, and this quote is interesting to reflect on because there can be consequences if that is the only way we consider our assets.

- According to ISO 55000 for Asset Management, there are six types of assets listed below.
- Digital (DAM) – processing and storage.
- Fixed – property, plant, and equipment.
- IT (ITAM) – hardware and software.
- Enterprise – holistic view across all assets.
- Financial – investments.
- Infrastructure – utilities, transport.

Conspicuous by its absence are People, who according to Sir Richard Branson are "the most important asset". This article is deliberately entitled 'Optimising asset performance' for reasons I hope will become clear.

MAXIMISING CUSTOMER VALUE

The common goal of all organisations is to meet the customers' requirements completely, repeatedly, and in most cases, profitably. If we focus our attention on fixed assets, which account for the majority of value-added work, then we can uncover some interesting points to consider.

Firstly, if we overproduce by constantly working the equipment beyond customer demand, then we are (in Lean terms) creating waste. This is the worst form of waste because we create inventory, which is not needed and overconsume raw materials, which can send spurious signals throughout the supply chain, leading to even more waste.

Secondly, are the assets operating at optimal condition or do we experience breakdowns, run below expected rate, or produce defects? These factors can dramatically reduce the margins or even run at a loss, meaning the more we make, the more we lose.

The model to help us here is the measurement of Overall Equipment Effectiveness (OEE). In contrast to utilisation, OEE looks at how well the asset performs when we use it.



BREAKING DOWN THE NUMBERS

We can calculate utilisation as the proportion of time the equipment runs. We may constrain this to the shifts we operate, however in complete terms we can look at how utilisation compares to 24/7 –the absolute total available time. The formula below can be used for calculating utilisation.

$$\text{UTILISATION} = \frac{\text{Total running hours}}{\text{Total available hours}} \times 100\%$$

Clearly, the greater the numerator, the greater the utilisation, but what if the output is poor? The OEE measure is far more useful to really understand what is going on, and it has three mutually exclusive elements that, when brought together, provide an overall measure of how effective our assets perform. The formula for OEE is as follows:

$$\text{AVAILABILITY} = \frac{\text{Run time}}{\text{Planned run time}} \times 100\%$$

For example, if we have an eight-hour shift with 30 minutes for lunch and two 15-minute comfort breaks, our denominator is seven hours (whereas in utilisation it would be eight). If we lose 30 minutes for breakdowns and 30 minutes for product changes, we only actually ran for six hours, so our Availability calculation is $6/7 \times 100\% = 85.7\%$.

$$\text{PERFORMANCE} = \frac{\text{actual output}}{\text{Hourly rate} \times \text{actual run}} \times 100\%$$

Continuing with the example, we only actually ran for six hours. If we have a run rate of 100 parts per hour, we expect 600 good parts, however there can often be fewer. In our example, we only have 500 parts, so the Performance calculation would be $500/(6 \times 100) \times 100\% = 83\%$.

The final calculation is Right First Time.

$$\text{QUALITY} = \frac{\text{quantity Right First Time}}{\text{Actual output}}$$

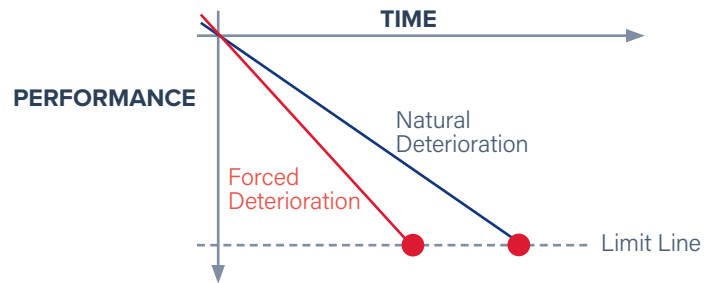
We would hope all 500 parts meet the quality standard; however, this is often not the case. In our example, we have 50 rejects, of which 25 are scrap and 25 rework, so 450 Right First Time. In our example, the quality calculation is $450/500 \times 100\% = 90\%$. Finally, OEE:

$$\text{OEE} = \text{Availability} \times \text{Performance} \times \text{Quality}$$

In our example, we multiply as decimal fractions $0.875 \times 0.83 \times 0.9 \times 100\% = 65\%$.

This would compare to a utilisation of 'using' equipment for six and a half hours of an eight-hour shift, so utilisation = $6.5/8 = 81\%$.

People may say “so what?”; this equipment might appear well utilised, but it is only making good product a little over half the time! What’s more, that figure is only going to get worse unless we operate it correctly, perform regular maintenance and solve problems as they occur; ideally whilst they are small problems.



This chart shows what happens over time to any asset as it is used. Components wear until they need to be replaced (ideally planned before breakdown occurs). The two lines represent what happens if we look after the equipment to maximise life (natural deterioration) or if we don't (forced, or accelerated deterioration). With this understanding, we can develop the most appropriate maintenance strategy to optimise performance (OEE) and how long we can make good product.

ENHANCING OEE

There are numerous strategies that can help improve OEE including planned maintenance, operator checks, predictive maintenance, Total Productive Maintenance and Reliability Centred Maintenance to name some of the common ones. Each of those are worthy of their own article, but for our purpose here, the key point is to measure true performance, understand the gaps, and build an equipment strategy to maintain and improve performance.

There have been suggestions in the past that 85% OEE would be ‘world-class’, but this is not true. It depends on the type of process. For example, a chemical processing plant should be at least 95%, whereas a press shop making low volume, high variety may never reach 85% and still be better than the competition.



HOW DOES THIS LINK TO PROFITABILITY?

There are some clear factors that help. Breakdowns are usually more costly than planned maintenance because more damage can arise in a breakdown – this is a direct cost saving. Secondly, if our assets 'live' longer making good product, the return on capital employed improves. These two factors have a positive impact on profit.

DO YOU WANT TO KNOW MORE?

We are the complete business transformation experts.

Our passionate team of growth and productivity specialists work with you to develop, inspire and improve every aspect of your organisation. The Sharing in Growth challenge and purpose is to accelerate your business growth and ultimately your bottom line.





SHARING IN GROWTH

Results driven. **Results proven.**



PRINCESS ROYAL
TRAINING AWARD
2020



Women in Aviation
and Aerospace Charter
A pledge for gender balance
across aviation and aerospace



Supported by the
Regional Growth Fund

Moor Lane, Allenton, Derby, England, DE24 9HY | 01332 269096 | info@sig-uk.org | sig-uk.org

