Choosing KPI's Relevant to your Business Objectives

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Introduction- The challenge of KPI's

It's not a new concept. For over 100 years people have been saying, in one form or another:

"What gets measured gets done, and what gets rewarded gets done again."

It's human nature to respond to what is made visible to both our peers and to those whom we report to. In today's manufacturing environment, this has led to the use of Key Performance Indicators, or KPI's, as a way to provide this measurement and visibility. Yet, KPI's, unless well managed and understood, can actually do more harm than good. Some of the challenges that we have seen manufacturers face while implementing a KPI strategy include:

- Information context. While working with one manufacturer that had seven different manufacturing sites we discovered that they were calculating one of their most significant manufacturing KPI's, Daily Production, five different ways. That resulted in an inaccurate picture of performance across the sites, and when the calculations were normalized, changed the way that production was optimized across the organization.
- Metrics not believed or accepted. If the users of the information don't understand the KPI's, and the way that the data is obtained and used to perform the calculations, they will not buy in to the results. This results in the measurements not being taken seriously and used. Unless everyone buys in to the KPI, presenting it is meaningless, and the typical result is that the values of other KPI's are also questioned.
- KPI's not relevant or are not actionable. Unless the KPI's are relevant to, or can be can be influenced by those being measured, they will typically be ignored. The person responsible for the KPI must feel that they are able to take actions that can improve the desired result it will become something that they either resent, or ignore. Similarly, if the KPI is not strategic to the business, then focusing on it becomes an organizational distraction.
- Encourage undesired behaviors. One of the side effects of KPI's is that they can encourage individuals to focus on improving what they are responsible for, to the detriment of the rest of the organization. For example having a KPI that is solely based on production levels can lead to a buildup of Work in Process (WIP) inventory, or off-quality stock that may not be useable by subsequent processing stations. Any KPI needs to be evaluated to determine how it can be used to improve the performance of the individual, with the greater organizational result in mind.
- Information overload. This probably the most common challenge with KPI's. It is very common for organizations to develop dashboards that contain tens of KPI's, without recognizing the average individual can effectively concentrate on three to five at any given time. This is not to say that others can't be made available, particularly if they can be drilled down to as part of a

measured KPI, but the ones that are made visible to a user should be kept to a minimum, so that those responsible can concentrate on making those improvements.

- Keeping "obsolete" KPI's in place. A final challenge with KPI's is the belief that KPI's are forever. The result is that they remain on people's operational displays, even after the objectives of using the KPI have been achieved and the desired behavior has become standard.. This, in turn, leads to the clutter and information overload described above. Once the objectives of a KPI have been achieved, then by all means continue to report on it, and develop alarms or triggers to ensure that performance does not degrade, but remove it from operational displays and let people concentrate on their key focus areas.

Understanding and managing these challenges is a critical part of the successful implementation of a KPI program.

The differences between business and manufacturing

With any KPI program, it is important to understand that the focus of the audience is different depending on the role that they play. For example, company executives focus on performance over a longer time period, while operations tend to focus on tactical issues in real-time. For example, the CEO of an organization is interested in information that impacts financial results, or occurs on a quarterly basis and are typically have a financial focus. They may be interested in KPI's such as Market Share, Stock Price, Earnings per Share, Return on (net) assets (ROA/RONA) or Return on (Invested) Capital (ROIC). A Vice President might be interested in KPI's that affect the monthly results, such as those that show revenue changes, cost reductions, risk management or brand/image awareness. A plant manager focuses on daily metrics such as production, quality or costs, while an operator focuses on shift, hourly or real-time metrics.

Understanding the focus that each organizational unit has, and presenting information to them in the form and context that they are used to greatly simplifies the effort in getting the buy in for the program, throughout the organization.

Additionally, the types of KPI's that are of interest to an organization will change based on the maturity of a business. For example, most organizations may have a strategic objective to lower costs or improve objectives. For an industry that is experiencing growth, this might be expressed as revenue per employee. For a company that is trying to sustain market share it may be expressed in terms of costs versus competitor's costs, while an organization that is in a decline may be interested solely in unit cost reductions. The strategic focus remains the same, but the metrics are completely different.

A well thought out series of metrics, along with a program to manage them, help companies achieve organizational agility by reacting faster to changes in the manufacturing or supply chain environments.

Influence of operational metrics on financial performance

The DuPont Model of Financial Analysis was devised in 1914 by F. Donaldson Brown, an electrical engineer employed by the E.I. du Pont de Nemours and Co. A few years later DuPont bought 23% of the

stock of General Motors and gave Brown the task of cleaning up the tangled finances of the car maker, possibly the first major re-engineering effort in the US. The DuPont model was the principle method of financial analysis for 60 years, until the mid 70's, Aligning Business measures with manufacturing metrics. It is still useful to use it as a simple model of explaining the impact of operational improvements on a business. For example, if a company is investing in an improvement project, we look at figure 1, we can see that having Overall Equipment Effectiveness (OEE), a common manufacturing KPI that is based on Availability, Performance and Quality, of 60% results, in this case, in an EBIT (Earnings Before Interest and Taxes) of $11.3MUSD and a RONA (Return on Capital Employed) of 6.8%.

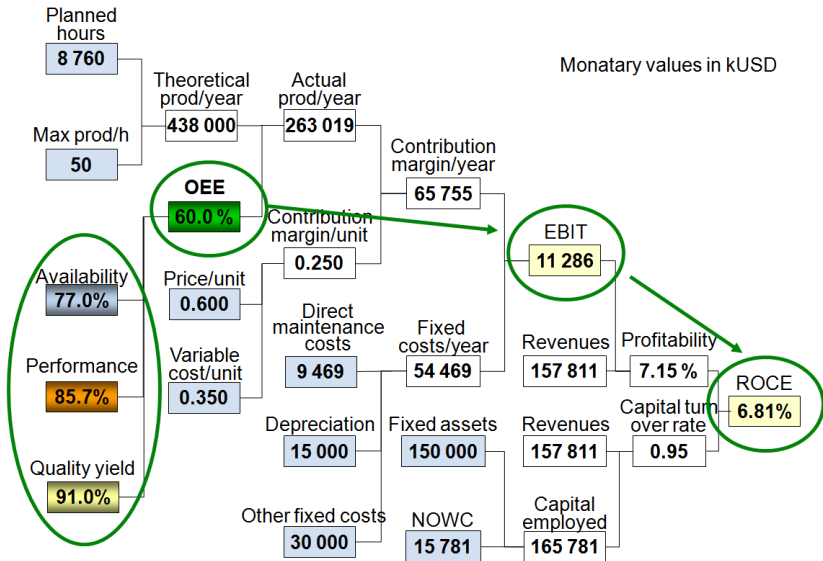

Figure 1: The DuPont model

Improving the OEE by to 70% would almost double the EBIT to $20.6MUS and the RONA to 12.3%, providing an easy to demonstrate how monitoring KPI's can demonstrate the value associated with the improvement projects.

Developing metrics

The most challenging part of implementing a metric program is to come up with meaningful measures. There is no easy way to do this, but it must be stressed that just adopting metrics used by other organizations may not help you achieve the desired results. In order to be successful, any program that is in place must be geared towards your specific organization.

The first step to developing metrics is to evaluate the organizational objectives that your management has in place, and map these back to manufacturing activities. For example, a business objective of Supply Chain improvement may mean little to someone in manufacturing, but this improvement can be decomposed into discrete activities such as manufacturing cost reduction, real-time connectivity between systems, or quality improvements. It should be possible to show how these KPI's play a role in the companies strategic goals. Often, I will use a company's annual report to get the key values that a CEO wants to focus on, and then to use these as a starting point to derive key objectives to focus on.

The next step is to further decompose these into easily understood metrics such as Overall Equipment Effectiveness (OEE), set-up time reductions or lost time injury reductions. These can, in turn be decomposed. OEE, for example can be reflected as availability, quality and performance. The key to this step is to select measures that can be readily understood, have values that can be obtained from known sources, either automatically (preferred) or manually, and that are understood by the users. Anyone who is accountable for a specific metric should also agree that they understand them, they understand the organizational value of the measure and that they know they are going to be evaluated based on the success of the measure.

Common manufacturing metrics

While organizations like MESA, SCOR or AMR/Gartner, ISA-95 or ISO 22400-2 have comprehensive lists of manufacturing metrics. Some of the more common metrics are included here:

Business oriented metrics

- Net Operating Profit
- EBITDA
- Labor cost per unit
- ROA / RONA
- Economic Value / Economic Profit
- Market Share
- Revenue per employee
- Order-to-cash cycle time
- On-time delivery to customer request
- On-time delivery to commit
- Average days total inventory

Some of the more common manufacturing related metrics include:

- OSHA-reportable incidents/year
- Energy consumption per unit of production
- Manufacturing cycle time
- Overall Equipment Efficiency
- Average hours overtime/week
- First-pass yield
- Capacity utilization
- Scrap/rework as % of sales
- CpK – process capability
- Warranty costs
- Emissions reductions
- Percentage planned vs. unplanned maintenance work

Achieving manufacturing metrics alignment

The process of implementing a KPI strategy that aligns with the overall business objectives can be viewed as a three step process

Step 1 – Strategy

- Understand Business Area(s) that your organization needs to focus on.
- Establish the priorities that exist in each of these areas.
- Map the manufacturing activities to metrics that tie back to these organizational objectives.

Step 2 - Implementation

- Define the manufacturing metrics in terms that are understood, agreed to and actionable.
- Bridge any gaps that might exist to be able to attain measurement data, either automatically (preferred) or manually.
- Implement metrics as part of the manufacturing process, and part of the understood responsibility of the employee.

Step 3 - Evaluation

- Continuously monitor the KPI's. Don't presume that since they are in place they are being used. Follow up on the measures; educate employees on the usage and the importance of these measures.
- Once the objectives are achieved, remove unused KPI's and replace them with new measures that are designed to achieve the next objective.

It must be noted that this is an iterative process; once the evaluation is completed the process is restarted, using other metrics to define the next level of improvement.

Summary

When developing a KPI program, there are a few things that should be taken into account. KPI's should be:

- KPI's must be measurable. Anything subjective can be interpreted in different ways by different people. Always strive for something that can be quantified.
- They should be meaningful to those being measured. It is difficult to get a buy-in if what is being measured isn't something to that the individual can relate to.
- They should roll up to composite KPI's, something that is part of the general business objectives
- They must be actionable. If the person being measured can't influence the results, the KPI will be meaningless to them.
- It should have an impact on operations. It should be possible to explain the importance of the KPI in terms of the larger organization.

- They must be agreed to. This combines a number of the points above. The individuals that are responsible for achieving certain KPI's must understand what the KPI is, what it is being used for, and they must agree that it is something that they can influence.

When implementing the program, these guidelines will help ensuring success.

- Start with the end result in mind. Ensure that the KPI's you choose can be mapped to business objectives.
- Keep the list short. For any operations make sure that they have three to five KPI's to manage.
- Remove obsolete KPI's. Focus on the behavior that you want to encourage, not the ones already learned