White Paper

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Leading and Lagging KPI's: What's the Difference?

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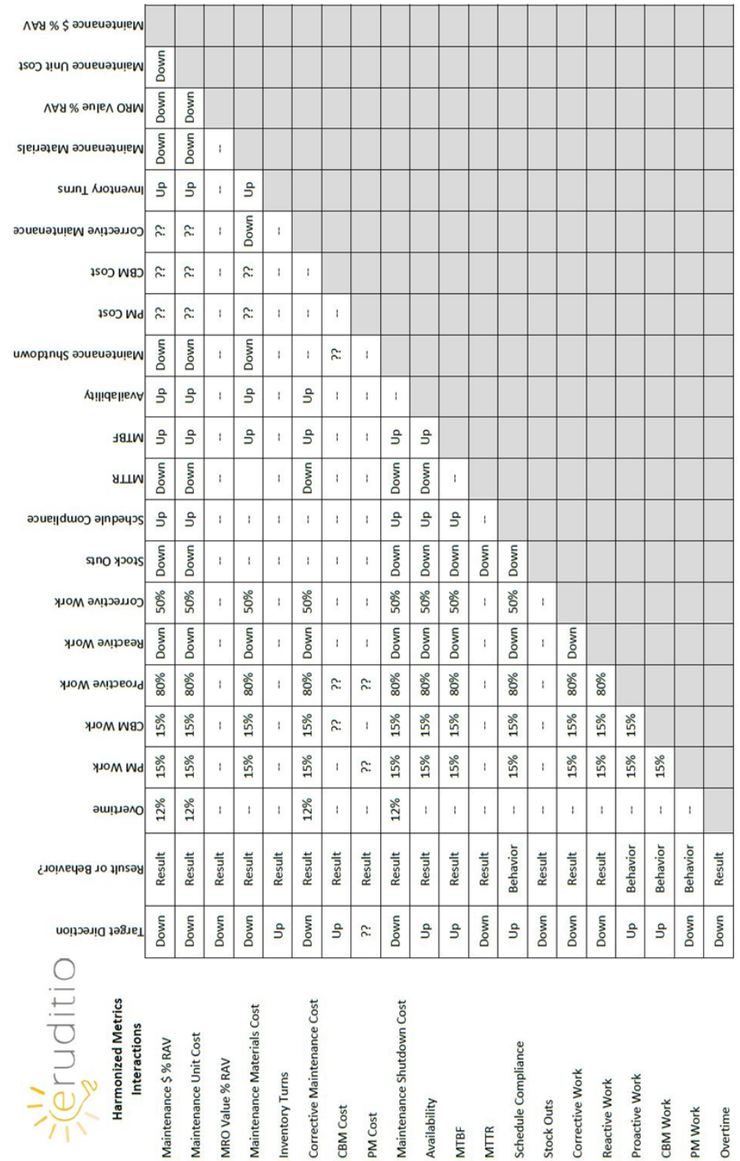

Harmonized Metrics Interactions

	Target Direction	Result or Behavior?	Overtime	PM Work	CBM Work	Proactive Work	Reactive Work	Corrective Work	Stock Outs	Schedule Compliance	MTTR	MTBF	Availability	Maintenance Shutdown	PM Cost	CBM Cost	Corrective Maintenance	Inventory Turns	Maintenance Materials Cost	MRO Value % RAV	Maintenance Unit Cost	Maintenance $ % RAV
Maintenance $ % RAV	Down	Result	12%	15%	15%	80%	Down	50%	Down	Up	Down	Up	Up	Down	??	??	??	--	Down	Down	Down	
Maintenance Unit Cost	Down	Result	12%	15%	15%	80%	Down	50%	Down	Up	Down	Up	Up	Down	??	??	??	--	Down	Down		
MRO Value % RAV	Down	Result	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Maintenance Materials Cost	Down	Result	--	15%	15%	80%	Down	50%	Down	Up	Down	Up	Up	Down	??	??	??	--				
Inventory Turns	Up	Result	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
Corrective Maintenance Cost	Down	Result	12%	15%	15%	80%	Down	50%	Down	Up	Down	Up	Up	Down	??	??						
CBM Cost	Up	Result	--	--	??	??	--	--	--	--	--	--	--	??	--							
PM Cost	??	Result	--	??	--	??	--	--	--	--	--	--	--	--								
Maintenance Shutdown Cost	Down	Result	12%	15%	15%	80%	Down	50%	Down	Up	Down	Up	Up									
Availability	Up	Result	--	15%	15%	80%	Down	50%	Down	Up	Down	Up										
MTBF	Up	Result	--	15%	15%	80%	Down	50%	Down	Up	Down											
MTTR	Down	Result	--	--	--	--	--	--	--	--												
Schedule Compliance	Up	Behavior	--	15%	15%	80%	Down	50%	Down													
Stock Outs	Down	Result	--	--	--	--	--	--														
Corrective Work	Down	Result	--	15%	15%	80%	Down															
Reactive Work	Down	Result	--	15%	15%	80%																
Proactive Work	Up	Behavior	--	15%	15%																	
CBM Work	Up	Behavior	--	15%																		
PM Work	Down	Behavior	--																			
Overtime	Down	Result																				

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Abstract

Key Performance Indicators (KPI) can be used to measure past performance or predict future performance. This is because there is a cause and effect relationship between leading and lagging KPI's. When a process is measured, it will in turn effect another process which is also being measured, providing insight to future performance. When Leading and Lagging KPI's are properly understood it provides unique insights to where the performance of the organization is going.

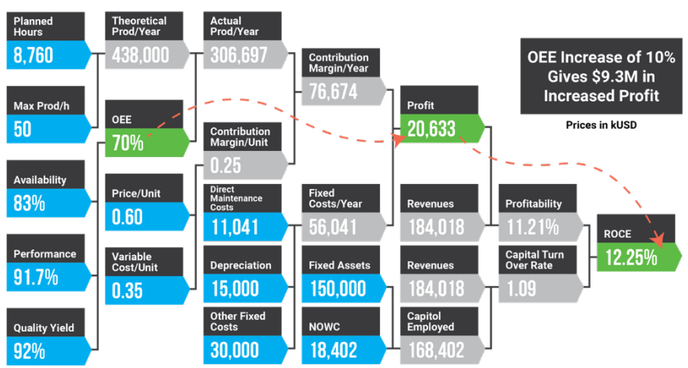
Leading and Lagging KPI's: What's the Difference?

The differences between Leading and Lagging indicators, as described within Maintenance and Reliability bodies of knowledge, are:

Leading KPI's measure performance before the business or process result starts to follow a particular pattern or trend. Leading indicators are used to predict changes or trends, as well as forward looking and help to manage the performance of a system or process.

Lagging KPI's measure performance after the business or process follows a pattern or trend and are used to confirm long-term trends. Lagging indicators are used to determine how well a process or system was managed.

A word of caution, KPI's can be both leading and lagging depending on where in the process they are located. As such, it is critical to fully understand the relationship between leading and lagging KPI's to ensure they are used correctly. So how do you determine or structure you KPI's to predict the future performance of the organization? Start with the goal that you are striving to achieve. This might be a cost measure of maintenance, such as Maintenance Cost per Unit Produced. With this goal, start to determine which processes will drive the improvement in cost reduction. In the case of Maintenance Cost per Unit Produced, fewer spare parts consumed will lead to reduced costs, as will a reduction in overtime. Therefore, MRO Inventory Turns and Percent (%) Overtime are leading indicators of Maintenance Cost per Unit Produced.



When the KPI's are organized in a hierarchical structure it is easy to see which KPI's are Lagging and Leading, and how future performance can be predicted. Regardless of whether the KPI is leading or lagging, it is critical that the data provide by the KPI, and trends being described by the KPI, demonstrate a logical flow of information that can be acted upon. If they are not, there is no point in measuring them.

Do you use Leading or Lagging indicators in your organization? What proportion of each do you utilize? I encourage you to share your stories, as everyone benefits from sharing experiences and learnings.