YOUR ASSET MANAGEMENT AND MOBILITY STRATEGY

8 KPIs to Improve Planning and Scheduling in SAP

PROMETHEUS GROUP

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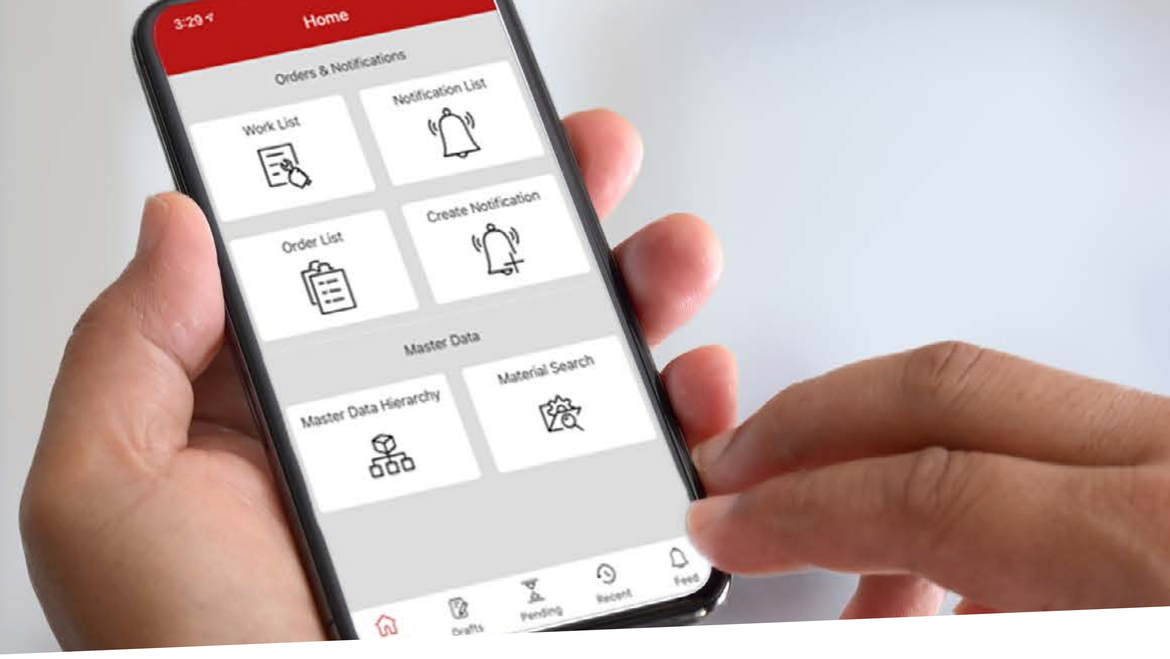
80%

That’s a number worth remembering. It’s the number of employees that say they’re unable to do their jobs without a mobile phone.[1]



Your Key Performance Indicators (KPIs) can be an extraordinarily useful tool when it comes to monitoring the success of your planning and scheduling. This capability is certainly helpful, but the true value of KPIs lies in how they can help you to improve on your current processes. Well-designed KPIs don’t just tell you how you’re doing. The most valuable metrics can provide the insight needed to make improvements to your processes

Each KPI should align with your overall goals. Choosing the “right” KPIs requires you to identify your greatest challenges and measure how well your team is meeting them.

Accurate, visible KPIs are essential to best practice planning and scheduling. Planners and schedulers need to know the overall goals of the organization and how those goals will be achieved. In turn, this requires that they know how well their current efforts are working, as this will give insight into how they can be improved.

Keeping a close eye on your metrics will aid maintenance in supporting operations and production. The methods your organization uses to collect data must use honest, clear, and actually show clear benchmarks of success or failure.

Every organization is different. That means there is no “one size fits all” solution to maintenance KPIs. However, we have identified eight KPIs that provide true value to almost any maintenance organization. These are the “must have” KPIs when it comes to improving planning, scheduling, and other parts of the maintenance workflow.

Accurate, visible KPIs are essential to best practice planning and scheduling.

[1] https://insights.samsung.com/2018/06/06/the-state-of-enterprise-mobility-in-2018-five-key-trends/

[2] https://offers.adobe.com/content/dam/landing/uploads/2017/na/AdobeReport_Driving_competitive_advantage_enterprise_apps_updated.pdf

1 Unplanned Downtime as a Percentage of Total Planned Production Time

The ultimate goal of maintenance is to maximize uptime. Every other stated goal of the maintenance department—increasing wrench time, more accurate planning, schedule compliance, etc.—is really about maximizing equipment uptime. Whether you phrase it as maximizing uptime or minimizing downtime, it boils down to maximizing productivity.

Understanding the duration of time equipment spends in various failure modes is vital information, but on its own, it isn't enough information to capture the full picture of data needed to understand the health of your maintenance strategy. Instead, you must look at unplanned downtime as a percentage of total planned production time. Downtime that takes place outside of planned production hours should not included in this metric. There's an enormous difference between a machine that isn't running because it isn't needed and a machine that isn't running because it has failed.

There are two primary benefits to tracking this KPI. The first gives your team the information needed to drive reliability investigations. You will need to look deeper to determine root causes of asset failure, but a rising percentage of downtime lets you know that there are gaps in your maintenance strategy.

The second benefit of measuring this KPI is that you can use it to justify improvements to your maintenance program. This is a straightforward metric that anyone across the organization can track. It can also provide support or leverage with management when you're asked to justify the cost of an improvement. Your organization likely already knows exactly how much an hour of lost production costs the company. This lets you easily determine the money saved by a decrease in downtime.

It becomes even easier to understand once that percentage is converted to money being saved. As noted, the KPI is a valuable metric to include as a part of your planning and scheduling performance analysis.

A rising percentage of downtime lets you know that something is wrong.

2 Schedule Compliance

Schedule compliance is simply a way to see how closely we're adhering to the schedule that's been set. There are multiple factors that could lead to low schedule compliance. An incomplete list of these factors includes personnel reasons, environmental factors, or a poorly designed schedule.

Be careful when making judgments on these numbers. Poor scheduling practices can both raise and lower your schedule compliance KPI. A consistent figure that is remarkably high may mean that your schedulers and your crews are exceptionally good…or it may mean that not enough work is being scheduled.

It's easy to achieve 100 percent compliance with a schedule that has a very few work orders to execute. Remember, the purpose of the schedule is not to be in compliance with the schedule. The purpose of the schedule is to complete more work.

You will almost always have some percentage of unplanned work. Keeping this to a minimum is one of the reasons we track schedule compliance.

Numerous studies have shown that scheduled work is much more cost effective and safer than unscheduled work.

Be careful when making judgments on these numbers. Poor scheduling practices can both raise and lower your schedule compliance KPI.

Case study:

Manufacturing

Hemlock Semiconductor is a leading provider of polycrystalline silicon and other silicon-based products used in the manufacturing of semiconductor devices and solar cells and modules. The company employs more than 1,000 people across five locations.

Hemlock Semiconductor faced many challenges coordinating maintenance work at its Michigan site due to archaic reporting and a complicated SAP system. Little to no time was available to schedule preventative maintenance because planners were overwhelmed with corrective maintenance scheduling and rescheduling. The company purchased the Prometheus ERP Advanced software solution to consolidate its systems and processes.

Upon implementation, Hemlock Semiconductor integrated its HR and PM modules for all maintenance planning and scheduling. Among other improvements, this provided senior administrators with enhanced insight into plant maintenance data and trends through KPI reports, which improved the company's ability to forecast costs.

PM Compliance

This KPI highlights how well we're following our preventive maintenance program. You might want to roll this in with schedule compliance, depending on your situation. In this case, poor PM compliance can present issues that aren't always present when looking at the whole schedule.

Many PM work orders are actually regulatory in nature. Falling out of compliance can result in devastating consequences that go far beyond equipment failure. In some industries and some jurisdictions, compliance with your PM program have the force of the law behind it. Ensuring that PM compliance is on track prevents both downtime and helps safeguard the organization from liability.

You should treat PMs as sacred even if regulations don't require you to do so. The point of preventive maintenance is to avoid unnecessary failures and the reactive work they require. When PMs start slipping, the overall reliability of assets will very quickly fall. This will inevitably result in more unplanned downtime, schedule breaking events, and safety issues.

Many PM work orders are actually regulatory in nature.

According to a reliable plant study, average wrench time is just **25-35%**.[5]

The world class standard is **85%.**[6]

Knowing what's shortchanging your time on tools helps paint a picture of gaps and shortfalls.

[4] https://www.plantservices.com/articles/2014/asset-manager-upside-cmms-mobile-solutions/ [5] https://www.reliableplant.com/Read/4722/wrench-time

[6] https://www.onupkeep.com/learning/maintenance-metrics/

4 Ratio of Planned to Unplanned Work

Tracking this metric can show your organization how much work was planned versus how much was unplanned. Our schedule compliance percentage tells us how close we came to meeting the schedule, and how much of our time was taken up by reactive work. This KPI is somewhat similar, in that we usually want a relatively high ratio of planned work to unplanned work.

You will almost always have at least some unplanned work taking place. There are some work orders that are too simple and too small to benefit from planning. In general, you want to keep that ratio as high as you can. Just like scheduled vs. unscheduled work, planned work is both cheaper and safer than unplanned work.

Keep this ratio as high as you can. Planned work is both cheaper and safer than unplanned work.

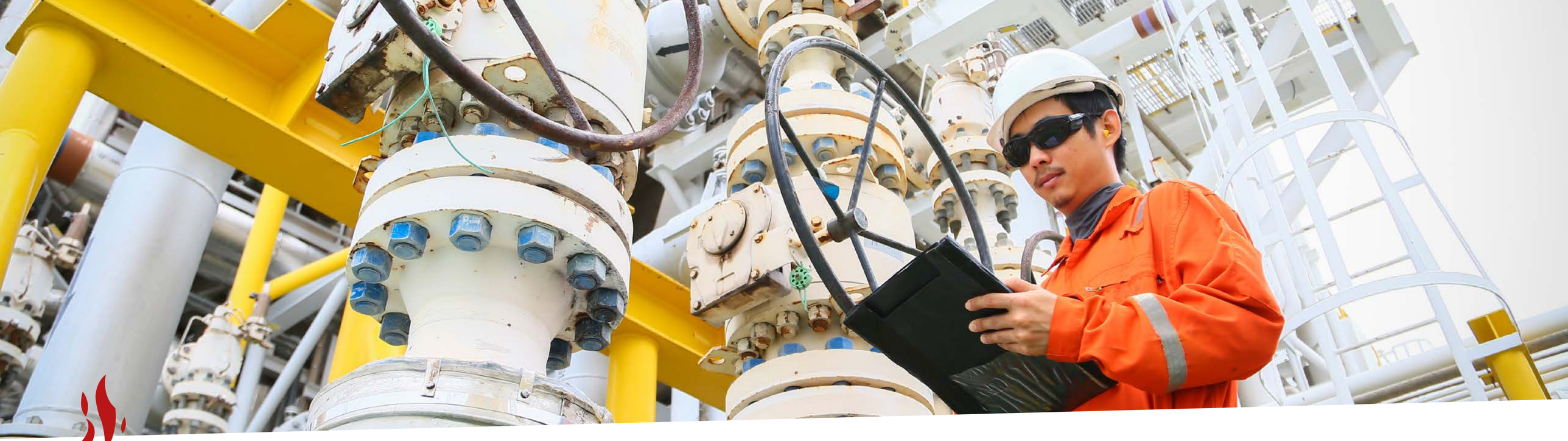
Case study:

Transport

Brasil Terminal Portuário (BTP) was established in 2007 to build and operate the largest port in Latin America. BTP focuses on sustainable business development, quality training, and professional qualification for all employees while continuing to improve operations.

BTP planned to improve maintenance process efficiency through a four-tier improvement project that required a scheduling solution, a mobile solution, a custom interface to bring data into SAP from another system and reporting capabilities inside of SAP. The first need BTP saw was a scheduling solution that worked with their ERP system. Prometheus Scheduler had all of the capabilities needed, and BTP began working with Prometheus Group. However, as they learned more about Scheduler and Prometheus Group as a whole, they opted to implement the entire ERP Advanced suite.

One part of BTP's improvement project was a solution for reporting within their ERP system that would compile the data needed to improve maintenance processes. BTP found what it was looking for with Prometheus KPI reports. The reports are customizable and are accessible directly in SAP. BTP selected Prometheus KPI reporting for the ease of use and the full system visibility that it offers.



5 Mean Time Between Failure (MTBF)

This is truly one of the classic reliability metrics, and for good reason. MTBF shows you the average time between failures. In other words, it shows you how often your equipment is failing. This can give you more insight on the bad actors and tells reliability engineers where to focus their efforts.

Paying attention to your MTBF can also help guide your PM program. A particularly short duration may mean that more frequent preventive work is needed. However, this can't be done without pretense. It's always best to engage in root cause analysis to determine the true cause of failure, rather than jumping to conclusions.

Ideally, MTBF can viewed by individual asset, asset type, or physical location. Each level will supply different insights into the overall situation.

Mean Time to Failure (MTTF) is similar. Usually, MTTF is used for non-repairable assets and modules. However, many organizations simply use MTBF for both of these situations and rely on job plans and standard operating procedures to tell them if a particular asset should be repaired or replaced.

Keeping sight of your MTBF can also help guide your PM program.

6 Mean Time to Repair (MTTR)

MTTR is the average time needed to repair failed equipment and return it to production. MTBF tells us how long we should expect an asset to function without failing. MTTR gives insight into how long it should take to restore the equipment to service. A high MTTR is invariably more expensive than a low one in terms of lost production.

A rising MTTR usually shows that something is amiss. The raw number itself will not tell you exactly what is wrong, but it's a sign that a situation should be investigated. An increase in your MTTR may be caused by inexperienced personnel, poorly written job plans, missing parts or equipment, and other factors. Determining the reasons for the increase will give you the insights needed to mitigate it.

Just like with MTBF, you can look at MTTR by asset, equipment type, or area, and each of these views will increase your understanding of that situation.

A rising MTTR usually shows that something is amiss.

Case study:

Materials

Nutrien is the world’s largest fertilizer company, by capacity, and their Canadian potash operations produce a large share of the global supply. The Canadian division began life as PotashCorp in 1975. As the company grew, so did the operating challenges with multiple vendors, different processes, and varied reporting definitions across the facilities. As a result, PotashCorp began a business improvement initiative with the end goals of aligning processes, consolidating spending, and improving data analytics to drive continuous improvement.

They selected our Scheduler and Analytics (now part of the Prometheus Platform) solution to meet their needs. Scheduler makes real-time KPIs visible and charts the impact of schedule and resource changes, as well as monitoring budgetary impacts. With the Analytics solution, global maintenance KPIs have been initiated for the first time. Users find it easy to build KPIs and armed with data, issues have been newly discovered, and behavior and processes addressed.

Inventory Stockout

Managing inventory can have a lot of complexity behind it. From one perspective, the correct type of stock to have on hand is “all of it” and the correct levels to have is “as much as possible.” If excessive inventory costs, storage space, and an infinite number of resources to devote managing inventory wasn’t a factor, “having as much inventory at all times” would be ideal.

Unfortunately, the bottom-line matters and most organizations don’t have the resources to manage a never-ending supply of inventory.

This usually means maintaining a balance between not having enough stock and carrying way too much. This is why you need a KPI dedicated to tracking your inventory stockouts. Carrying excess stock is certainly costly, but stockouts are expensive too. Every hour you’re waiting for stock to replenish is an hour lost. Each hour lost is usually lost by both operations and maintenance, so in reality, you.

Tracking your stockouts is the first step in minimizing how often they occur. If you’re getting a high number of stockouts, you may need to improve your material requirements planning process, such as by setting more appropriate minimum stocks or safety stocks.

When combined with inventory usage KPIs, tracking your inventory stockouts can also help you determine which items should be stock and which should be non-stock.

Carrying excess stock is certainly costly, but stockouts are expensive too

8 Maintenance Budget to Actual Spend

Typically, you want to be on budget; not under, and certainly not over. Being under budget may sound like a cost-effective strategy at first, but it often means that you won't get that same budget next year. Of course, those policies vary from one organization to another. Your organization may budget freely, with the expectation that you will do your best to come in under budget, not at it.

Nonetheless, you will want to check your actual spend against the maintenance budget. Tracking these numbers as you go allows you to make the necessary adjustments. Note that this does not always mean spending less. If you find yourself in early Q4 with half of your budget left, then it might be time to start looking at overtime and contractors. They can work through the backlog or do more PM work.

The reverse is a much more common situation for maintenance: too much to do and not enough money to get it all done. This is where tracking actual spend vs. budget really pays off, especially when you combine it with other metrics. You can see where the money is flowing to and redirect the budget you do have to where it will do the most good.

Redirect the budget you do have to where it will do the most good.

Case study:

Industrial Gases

Messer North America is a leading global provider in industrial gasses, manufacturing and supplying gasses like oxygen, nitrogen, carbon dioxide, special gases, and a variety of gas mixtures to various industries. Messer wanted a mobile solution to help workers in managing, tracking and completing maintenance tasks, operations, and inventory, while providing more insight into their processes.

They were looking for an easy-to-use planning and scheduling tool and a mobility solution that would simplify and streamline work in SAP, while integrating seamlessly to maintain SAP as their single source of truth. Working with the mobility team at Prometheus Group, Messer implemented Prometheus Mobility and PM Advanced Tools which supplied more work flexibility from the field and accessibility to their ERP system. This has provided Messer Norther America with many advantages, including greater insight into their KPIs.

“If the data is better, then it allows you to make better risk-based business decisions around maintenance. Then, you’re at least winning the battle,” said George Kenyon, Business Systems Manager for Messer North America.

Tracking your KPIs will help to improve your planning and scheduling processes and the overall maintenance strategy. However, for this to be effective, it is vital that you track the right KPIs and understand the picture they're painting. The "right" KPIs are the ones that align with your organizational goals. The goal of the maintenance department must always be to support organizational goals by reducing downtime to the absolute minimum.

Some of the KPIs we've outlined here can be found directly in SAP. For example, Mean Time to Repair (MTTR) has a direct report in SAP PM-IS (the t-code for this is MCJB). However, some of the KPIs that are of the most value to maintenance must be constructed by drawing information out of the SAP system, sometimes from several areas, and then combining the information in such a way that it tells you what you need to know.

This is certainly achievable but doing so means you no longer have a single source of truth. Even if that weren't an issue, the process of doing so is often long and tedious. Time is always at a premium in maintenance. Your planners and schedulers probably agree that tracking KPIs is an excellent idea and a great guide to improving their processes. They only avoid doing it now because their days are already filled with mission critical work!

The Prometheus Platform for SAP can give you easy access to exactly the KPIs you want and that your planners and schedulers need to improve their processes. Just as important, the Prometheus Platform allows you to easily change your KPIs as you overcome old challenges and recognize fresh ones.

Designed specifically for the needs of maintenance asset management, the platform also bolts directly to SAP, meaning you will always maintain a single source of truth.

Learn how to maximize your mobile solution.

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