DOWNTIME SYSTEM BUSINESS CASE DEVELOPMENT

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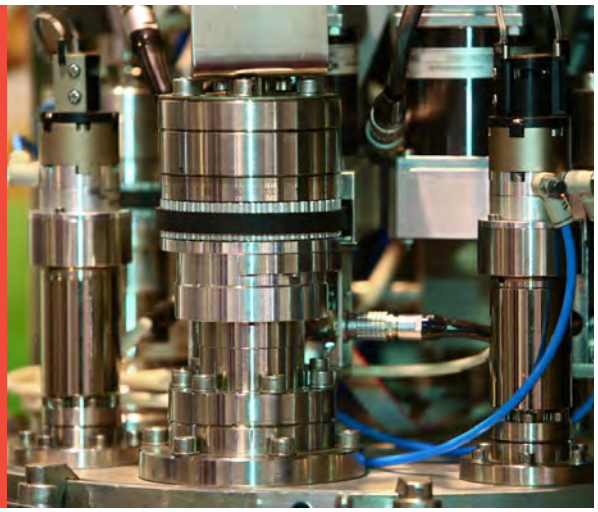
WELCOME



Executive Summary

You can gain a better understanding of your operations and identify root causes of lost capacity by implementing a downtime tracking system like RtDUET. In this white paper, we examine the methods of justifying the implementation of downtime tracking systems. This study will cover the following business cases:

- Case 1: Improve process availability and increase production by uncovering hidden opportunities
- Case 2: As a result of tracking slowdown events, higher throughput is achieved by operating closer to budgeted rates
- Case 3: By eliminating tedious data management, more high-value tasks can be accomplished by technical and operations personnel

The objective of this three-part study is to provide engineers and analysts the solid foundation for building a business case for the implementation of a downtime tracking system.

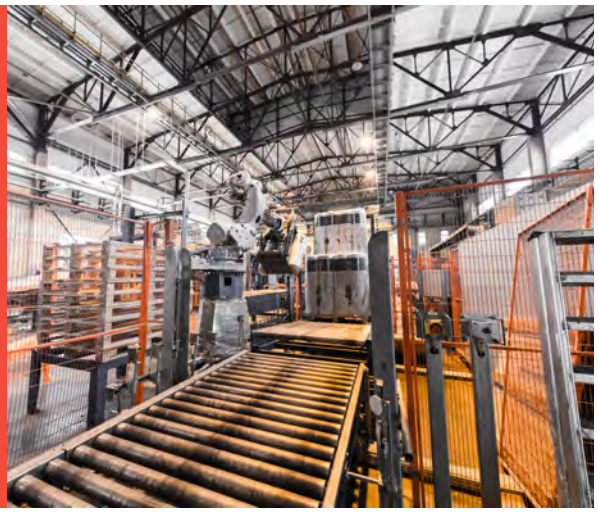
INTRO

Building the business case for a downtime tracking system

A robust downtime tracking system is critical for improving the productivity of your operation and driving down cost. Any investment is subjected to a project evaluation to ensure the expected benefits outweigh the costs. However, as with many data management projects, the investment in a downtime tracking solution doesn't necessarily directly result in a return on your investment. Rather, tools like RtDUET are an enabler for operations to more efficiently gather and manage their data and ultimately use that data to drive improvements in their business.

The following three business cases can be used to underpin the development of a project authorization request at your plant.

CASE 1



An increase in running time

Most operations are already tracking downtime events in their plant in some way. Many times, this is done manually by operations or technical staff in the plant. Due to the time-consuming nature of this task, there is usually a trade-off in the accuracy or extent of tracking that is done. This can result in missing short events (e.g. <5 minutes) or simply not tracking all the assets the plant would like to.

Another consideration is the data quality within the downtime tracking system. Manual systems that rely on operator commentary, classification of events and recording of stop and start times can lead to slight errors in the dataset. This can result in incorrect conclusions being drawn about root-causes. Automated systems rely on a standardized reason code tree, pre-defined classifications of down codes and recording of event timing down to the second. A clean, accurate and rich dataset is the foundation of any robust analytical practice. Downtime tracking systems like RtDUET can prove instrumental in uncovering hidden opportunities for process improvement. Ultimately, this results in increased operating time for your key assets in your plant.

The value of operating time varies from plant to plant depending on the throughput rate and value of the product. In simple terms this can be calculated as:

Budgeted Instantaneous Rate x Increase in Runtime x Net return on Product

For this scenario let's imagine a plant that is budgeted to produce 500 units per hour with a net product value of $45 per unit. The plant currently has a running time of 90%. Based on RtTech's experience, capturing 10% relative of the remaining calendar time is a typical performance improvement that can be obtained by analyzing data captured by the downtime tracking system. In this case, there is 10% remaining calendar time (100% - 90% = 10%). Taking 10% of this number would result in a 1% improvement in running time. This would give us:

(500 units per hour) x (+1% x 8760hrs/year) x ($45/unit) = +$1.97 M per year

Thus, an increase from 90% to 91% running time would result in an added $1.97 million in annual revenue for this plant.

Another way of developing this type of business case can be seen in the following example from an RtTech client in Canada.

The client, a multi-national manufacturer in the food industry, performed an analysis of their data captured by RtDUET and found that operator breaks were taking, on average, 4 minutes longer than budgeted. At this location, all operators went on break at the same time resulting in a line stoppage which would occur 6 times per day. The engineers had determined that this overage resulted in 9 extra hours of line downtime per month.

Upon closer analysis of operator behaviour at break-time, they found that people were in the break room right up until the 15-minute mark, which they would then need to get dressed and walk out to the line causing another 3-4 minutes of downtime on the line.

Through the addition of a breakroom countdown timer with a notification when 1-minute of break time remained the operations team was able to get the average line stoppage due to breaks under 16 minutes. This one improvement alone more than covered the implementation cost of the downtime tracking system over the first 3 months.

With this type of analysis, a break-even business case can be developed based on the minimum increase in running time required to pay for the implementation of the downtime tracking system. Our formula from our previous example will now look like this:

(Cost of Implementing Downtime Tracking System) / (Budgeted Instantaneous Rate x Net Return on Product)

From the previous scenario we can assume a budget rate of 500 units per hour and a net return of $45 per unit. For a typical $50,000 implementation cost this would result in:

($50,000) / (500 units/hr x $45/unit) = ($50,000) / ($22,500/hr) = 2.22 hrs

In this scenario, a $50,000 implementation cost would be covered with a minimum 2.22-hour improvement in running time.

In either of the above examples the driver for the business case is the ultimate increase in running time stemming from the analysis of data captured by the downtime tracking system. As previously stated, the automatic nature of the downtime tracking system should uncover hidden opportunities to increase running time.

Unplanned downtime is estimated to cost 10X the cost of scheduled downtime

CASE 2

An increase in production rate

While most operations are tracking downtime events very few are also tracking when their production rate falls below the budgeted expectations. This is largely due to the complex calculations required to determine the deviation in rates as well as the resulting productivity loss. Automated downtime tracking systems like RtDUET, can be easily configured to trigger “slowdown” events based on the actual production rate and expected rate (either budgeted or planned). Once triggered, these systems then calculate the weighted or equivalent downtime so that slowdown events can be compared to downtime events in terms of lost production opportunity.

To calculate the benefit from increased production rates the following formula can be used:

Production Rate Increase x Net Return on Product x 8760 hrs in a year x Running Time %

In RtTech’s experience, capturing 15-25% of the available rate opportunity is a typical performance improvement. For example, a plant with a budgeted rate of 500 units per hour has an actual average instantaneous rate of 476 units per hour. This leaves an available rate opportunity of 24 units per hour (500-476 = 24). In this case, an increase of 4 – 6 units per hour would be typical by acting upon analysis of the slowdown events captured by the downtime tracking system. In our scenario this would be:

(4-6 units/hr) x $45/unit x 8760 hrs/yr x 90% runtime = $1.42M - $2.13M per annum

Thus, an increase from 476 units/hr average to 480-482 units/hr average would have an annual value of $1.42-2.13M.

For many operations, rate loss tracking provides a large untapped potential for operational improvement. By using the above methodology, a business case can be built based on achieving a higher average throughput stemming from analysis of data captured by the downtime tracking system.

81% of organizations believe digital tools play a significant role in reducing unplanned downtime.

CASE 3

Better Staff Utilization

In both above cases related to increased running time and increase production rates, the downtime tracking system is a tool used to uncover the opportunity. These can be considered in-direct benefits of the downtime tracking system. A direct, immediate benefit of implementing a system like RtDUET is the freeing up of technical and operations resources to do more value-added activities than data management. With both manual and home-grown systems, the effort required to record, manage and report on downtime and slowdown events can be substantial. In many operations, process, reliability, and production engineers can spend most of their mornings reviewing records, cleaning data, and preparing downtime reports. Control room operators can also be burdened with tedious recording of downtime events, multiple entries of commentary, and transcribing of datasets across systems (ie paper to excel). In many cases, this is too high a price to pay of valuable technical and operations staff and thus the quantity or quality of downtime data is sacrificed.

A downtime tracking system automates much of the data management tasks borne by technical and operations staff. With a comprehensive time-usage model, standard reason codes, and automatic coding of events, RtDUET can significantly reduce the time spent managing downtime tracking systems. However, quantifying this benefit can be difficult. By eliminating certain tasks from day-to-day operations, the headcount could be effectively reduced. By measuring the time spent recording, managing, reporting, and cleaning downtime data, you can determine the potential savings in labour hours. Typically, this would be 8 hours per week for technical staff and roughly 15 hours per week for operators. The effort could be more depending on

the complexity and quantity of downtime data being captured. RtTech has experienced a reduction in technical staff effort of 8 hours per week to 1 hour per week and operating staff effort of 15 hours per week to 3 hours per week after implementing RtDUET. This would result in a 988-manhour savings per year.

The valuation of this time saver can be calculated in a few ways:

1. 988 man-hours can be reduced or approximately 0.5 FTE
2. The 988 man-hours can be repurposed to perform value-added activities such as analysis and process improvement
3. It is possible to maintain the effort level while expanding the scope of downtime tracking. The advantage of this is that a greater dataset can be obtained, which increases the potential for process and reliability improvements.

While not straightforward to quantify, the reduced effort by technical and operating staff can be highly beneficial to your operations. Allowing your highly trained staff to perform high-value activities instead of tedious data management tasks can lead to greater employee engagement and ultimately greater operational performance.

In the mining industry, the loss of 1 excavator for 1 day can cost upwards of $5 Million.

CONCLUSION

The downtime tracking system is critical for identifying the key capacity losses in your operation. Developing a succinct business case can be difficult with any enabler project like a downtime tracking system. Focussing on the potential benefits stemming from the subsequent data analysis in terms of increased running time and throughput is usually the easiest path. However, the reduced effort from technical and operating staff to produce the datasets and reports should not be ignored.

The cases reviewed in this white paper should provide a good starting point for any analyst to begin building their own business case for an automated downtime tracking system.

The cost of unplanned downtime is equal to approximately 5% of total output.

NEXT STEPS

To learn more about how RtDUET can be the right fit for your operation, visit www.rttechsoftware.com or reach out to one of our implementation experts.

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