The efficiency of a production facility is linked directly to the efficiency of the individual machinery that makes up the facility. When machinery falters, the facility falters; when machinery fails, the facility fails.

In a capital-intensive industry such as mining, where a typical greenfield site costs over $450million, the cost of downtime is over $1million per day. In high commodity applications such as bottling plants, an hour of downtime can cost the plant a days profitability.

Many of these situations are commonly experienced, and the vast majority of them are avoidable, with the appropriate monitoring and analysis software. Citect’s Downtime Analysis module provides producers with an intuitive tool for monitoring and improving plant utilization and efficiency.

By automatically collecting, storing and analyzing events that lead to downtime, plant managers and engineers can proactively and effectively improve plant ROA.

**Types of Downtime**

As shown in the diagram below, there are many types of downtimes, ranging from complete production halt, to machinery that is operating below its specified level, to scheduled stoppages for routine maintenance. All of these constitute Downtime to a manufacturer. All impact production and can be improved in some manner, even if that means simply scheduling maintenance more efficiently.

Automated Downtimes are gathered automatically from the control system. Manual Downtimes are entered when there are no electronic means of detecting the failure.

A Downtime Analysis system needs to cope with all of these types of downtimes and report on them seamlessly.

**Aim of Downtime Analysis**

The aim of a Downtime Analysis tool is to identify problems and trends within a facility to minimize the impact of failures for individual machinery, and hence maximize the efficiency of the overall facility.

**How it Works**

Rules, which are sometimes quite complex, are setup in the Downtime Server so that it can monitor events in the control system. When a rule is met, a Downtime is triggered, and as much information as is electronically available about the Downtime is logged to the Downtime database. A Downtime Notification is sent to selected users to pro-actively notify them of the event.

<table>
<thead>
<tr>
<th>Calendar Time</th>
<th>Required Time</th>
<th>Standby Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Time</td>
<td>Unscheduled Downtime</td>
<td>Scheduled Downtime</td>
</tr>
<tr>
<td>Unscheduled Process Downtime</td>
<td>Unscheduled Equipment Downtime</td>
<td>Scheduled Process Downtime</td>
</tr>
<tr>
<td>Scheduled Equipment Downtime</td>
<td>Standby Downtime</td>
<td></td>
</tr>
</tbody>
</table>

Healthy facility status. No Downtime Analysis is required.

Planned stoppages or output reductions. More information can help efficiencies through better scheduling and planning processes. These should be captured for Downtime Analysis.

Unplanned stoppages or output reductions that significantly affect the facility's ability to deliver high quality, high throughput product. These are the most costly delays, and those that must be captured for Downtime Analysis.
Authorized users can then open the Downtime Monitor and complete the Downtime log for that event.

Powerful filtering and reporting tools allow managers to analyze the facility to make better decisions regarding maintenance, scheduling or priorities to maximize the efficiency of the facility.

**The Downtime Monitor**

The Downtime Monitor is an interface that allows users to enter data, adjust parameters and report on both production and equipment downtime. It is an intuitive web interface based on the Plant2Net platform.

A tree structure allows the facility to be represented graphically, making access to equipment fast and intuitive. A list of Downtimes is presented in date/time sequential order with powerful filtering and summary tools.

Downtimes can be selected from this list, and users with appropriate privileges may enter cause locations, causes and classifications from pull down lists, as well as enter free text comments and explanations, or new manual Downtimes.

Users can filter Downtimes by almost any available combination of parameters to create custom reports and views. These filtered views can then be saved for fast access in the future via Favorites. Downtime information is stored in a MS SQL Server allowing fully customizable reports outside the Downtime Analysis package if required.

**Key Benefit**

The Citect Downtime Analysis solution allows producers to maximize their ROA by helping improve production and equipment efficiency across CitectSCADA, Wonderware InTouch, and Intellution Fix32 and iFix control systems.