Downtime Tracking and Effectiveness Optimization System

REAL BUSINESS VALUE

Using the detailed information from DT Analyst, plants are equipped to:

- *Increase asset utilization. With timely information about downtime, faults can be addressed faster.*
- *Increase effective capacity. Using information from DT Analyst, plants can increase production with existing assets by simply working smarter.*
- *Identify causes of unplanned downtime. Readily available accurate downtime information makes it easy to find the most significant problems and focus improvement efforts on them.*
- *Improve plant profitability. The value of increased production and efficiency drops straight to the plant's bottom line.*

DT Analyst™ enables plants to significantly improve efficiencies and production by capturing detailed fault and efficiency information from plant equipment and operators and providing analysis tools that identify opportunities for improvement. Along with Wonderware's other industrial intelligence solutions, DT Analyst gives users a more precise understanding of plant operations and helps them visualize, analyze and optimize plant operations.

Equipped with information from DT Analyst, plant engineers and managers can make informed decisions, answering such questions as:

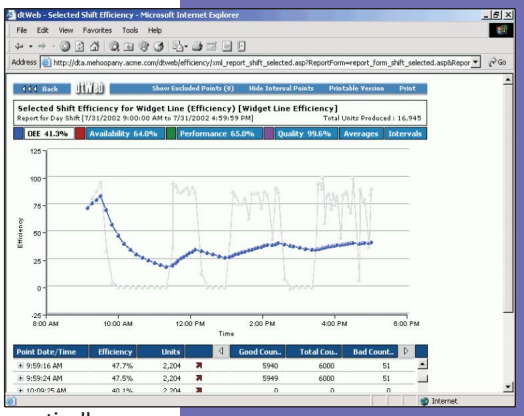
- Which raw materials from which suppliers are processed most efficiently?
- How much does the difference in production across lines depend on the equipment, product, shift and operator?
- Which of the machines need to be serviced, replaced or decommissioned?
- What are the most severe availability problems?

Armed with answers to these types of questions, plant staff can make impressive improvements in plant profitability by favoring better suppliers, identifying and spreading best practices, and targeting maintenance activities. The detailed information collected by DT Analyst also makes it easy to quantify the benefits required to justify capital projects.

HIGHLIGHTS

Driving World-Class Manufacturing Performance

The central value of DT Analyst lies in the broad range of proven tools it provides that can be used to drive continuous improvements in manufacturing performance. These tools provide the plant team with accurate machine-collected data, operator involvement in specified downtime events, and Web-based reporting and analysis tools, all in a user-configurable system. Information about equipment faults, materials problems, scheduling issues, operator problems and maintenance issues are tracked on a continuous basis. To analyze this information, users may choose from hundreds of automatically generated reports that are available through their Web Browser. For example, the user can easily choose pie or bar charts, summary reports, or detailed tabular reports to compare and analyze manufacturing performance by shift, product, job, line, operator, or other pertinent variable.



OEE charts combine instantaneous real-time (gray), average OEE (blue) and details in the same report.

Overall Equipment Effectiveness

Overall Equipment Effectiveness (OEE), a widely used metric of efficiency, compares the performance of plants, lines and even production teams. OEE also combines product quality, equipment availability and performance into a single, easily understood metric. With the optional OEE module, DT Analyst extends this well-accepted metric to be near real-time, significantly increasing the value of the metric by shortening the response times to impending problems. Problems are understood and resolved before productive output is lost. OEE enables DT Analyst

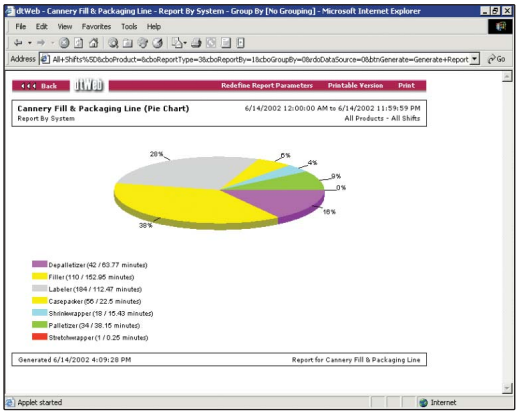
invensys Wonderware®

Powering intelligent plant decisions in real time.

to be a valuable tool for informing operational, as well as administrative, decisions. OEE calculations are tracked and analyzed with the web-based reports.

Tap into your Plant's Hidden Capacity

Adding new equipment or additional shifts is very expensive. DT Analyst enables manufacturers to optimize their production process and tap into the plant's hidden capacity by reducing downtimes, changeover time, maintenance problems, and product flow problems. Push the equipment to run at a higher rate—DT Analyst will provide you with the data that enables you to determine if you are achieving a net gain, and where the bottlenecks occur.



Pre-defined pie and bar charts make downtime data easy to analyze.

Automated Collection

Traditionally, equipment downtime information was collected with pen and clipboard, making even cursory analysis of the data practically impossible. Computerized "clipboard replacements" make the analysis practical, but rarely improve the quality of the data collected.

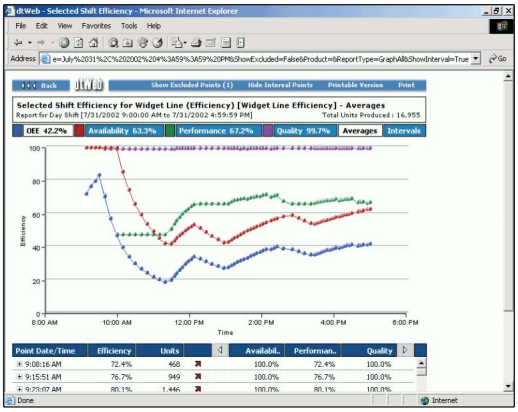
Operators are generally more interested in getting the equipment operational again. Even the most conscientious operators are unlikely to record the numerous short downtimes and slowdowns that commonly occur. With concerns about how downtime data will be used to evaluate them, operators may even actively resist accurately recording the data.

DT Analyst ensures the data is accurate by collecting it directly from the control equipment or any other system with OPC Data Access or a Wonderware® SuiteLink™ server. Using easily configured logic—not programming or ladder logic—DT Analyst can evaluate multiple tags and logical conditions (such as the state of another system) and determine the impact on availability by recording likely causes, exact times, durations, and associated information. Because DT Analyst doesn't require control system changes, it's easily applied in validated facilities, without costly re-validation.

Operator Involvement

DT Analyst also preserves an essential element of the traditional "clipboard approach" to the collection of performance data: operator involvement. While automated collection is ideal for capturing exact times and durations, operator involvement is sometimes required to assess the causes of downtime. DT Analyst integrates with an existing human-machine interfaces (HMI)—such as Wonderware's InTouch™, Intellution's FIX and iFIX, Rockwell Software's RsView, Siemens' WinCC and CiTechnologies' CiTect—to selectively involve operators in data collection, notifying them of faults and prompting for causes and comments, as appropriate.

Operators can also be involved, when necessary, to indicate planned downtimes and product changes, and to provide other information that is not instrumented. This selective involvement focuses operator attention where it should be: on the line. DT Analyst prompts only the appropriate operators for their valuable insight, and only when needed.



Examining the OEE (blue) components reveals how availability (red), performance (green) and quality (purple) impact efficiencies.

A Cost-Effective Solution

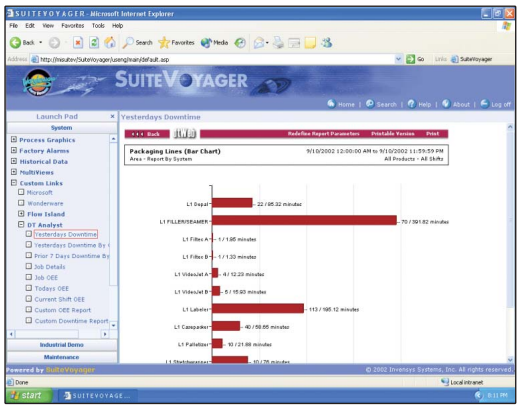
Not only does the wealth of information within DT Analyst make it easy to justify, but it is the most cost-effective solution of its type because:

- Downtime logic is configured directly within the DT Analyst system, not externally in custom programs and ladder logic.
- As a standard product solution, DT Analyst provides broad capabilities at a fraction of the cost of a comparable custom solution, especially when the cost of support is considered.
- Flexible reports are pre-defined, so valuable engineering time isn't spent developing databases and reports.
- DT Analyst is compatible with existing software and infrastructure. There is no need to replace existing historian, HMI or control systems.

SuiteVoyager™ Support

DT Analyst's web-based reports can be easily included within a SuiteVoyager™ 2.0 portal. Users

can pre-define the reports of interest and access them using system-wide or personalized links within SuiteVoyager™.



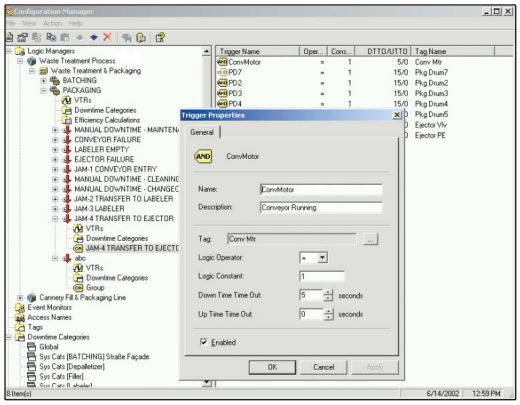
DT Analyst reports are easily accessed within Wonderware's industrial portal, SuiteVoyager.

ARCHITECTURE

The DT Analyst system is built around a Microsoft® Windows NT/2000® server and various distributed clients.

Configuration Manager

The Configuration Manager provides a structured, easy-to-navigate method for defining a comprehensive downtime and efficiency tracking system. Using a familiar point-and-click web interface, users can quickly configure the equipment and its associated downtime conditions, as well as categories, schedules, and event monitors. The Configuration Manager is self-documenting and provides many productivity-enhancing capabilities like copy/paste, reorder and category and schedule groups that can be reused throughout the configuration.



The Configuration Manager provides a single environment to easily configure equipment, downtime causes and downtime detection logic.

Logic Manager

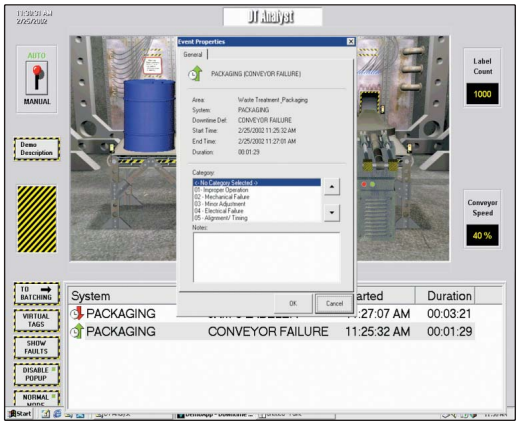
The Logic Manager continuously monitors plant data to detect meaningful events and record them in the DT Analyst database. The Logic Manager provides powerful methods for calculating performance, availability, quality, OEE, product counts, rejects, downtime, runtime, and collecting ancillary production information through values to record (VTRs). VTRs can track package size, flavor, nominal line speed, set line speed, counter values, text strings or any other tag related value. Event Logic can be based on multiple logical groups and multiple triggers based on tags, as well as the state of other systems or downtime definitions.

Database

DT Analyst stores all configuration and downtime information in a Microsoft SQL Server database, making it easy to maintain with existing tools. Since DT Analyst does not require a custom database platform, the system fits within the existing information technology infrastructure.

Event Monitor

Using the Event Monitor, system operators can respond to downtime alarms and manually enter additional information relating to an incident. The Event Monitor also permits the operator to record other events, such as planned downtimes from changeovers, cleaning or scheduled maintenance.



DT Analyst prompts operators for downtime causes, selectively involving them in downtime tracking.

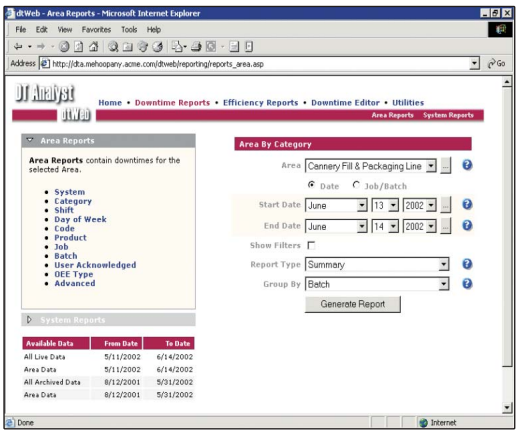
Many automated lines have 1,000 or more stoppages per week. Because it is not practical to involve operators in every one of these events, the DT Analyst Event Monitor selectively involves plant operators in collecting supplemental downtime information that provides additional insight. This significantly reduces the collection burden on the operator. The Event Monitor involves the operator when certain events occur for a pre-configured duration. An example would be when the job standard exceeds the time required to restart stopped equipment or line.

The Event Monitor is an ActiveX™ control that can be used in Wonderware's well-renowned InTouch HMI or Intellution's FIX32 and iFIX, Rockwell Software's RSView32, Siemens' WinCC, CiTechnologies' CiTect, or within Microsoft's Internet Explorer.

Invensys Wonderware®

dtWeb Reports

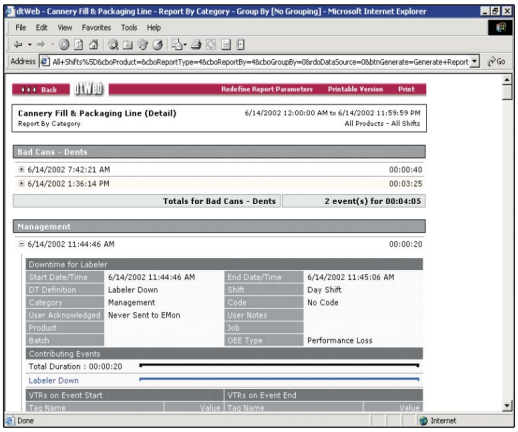
DT Analyst offers the ultimate analysis flexibility, without the burden of creating custom reports. All DT Analyst reports are provided via the dtWeb website, allowing ready access to critical information throughout the organization. Users can choose from hundreds of standard reports to compare information by equipment, shift, product, batch or other pertinent variable.



Quickly select from hundreds of pre-defined reports, without investing in expensive customized reports.

Downtime Editor

The web-based Downtime Editor allows users to view the collected downtime information in a graphical format, similar to a Gantt chart. This can provide additional insight into the sequence of events that occur during downtimes. In addition, the Downtime Editor allows authorized individuals to view and update the detailed event information. They can add comments, edit the reason and duration of downtime, or edit the values automatically recorded during downtime.



Interactive, web-based reports effectively balance details and report length.

SYSTEM REQUIREMENTS

The requirements for the Server and Client (Event Monitor) systems are defined below.

Description	Server	HMI Node	Business Node (Web Browser)
Supported Operating Systems	Windows Server 2000	NT Workstation Windows 2000 Professional	Win 9X, NT4.0 or Windows 2000 with Internet Explorer 5.0 or higher
Minimum CPU	Pentium 400MHz	Pentium 200MHz	Pentium 90MHz
Minimum RAM	128 MB (256 MB Recommended)	64 MB (128 MB Recommended)	48 MB
Minimum Free Hard Drive	300 GB (Plus Database)	30 MB	N/A

Contact Wonderware or your local Distributor for information about software products for industrial automation.
Wonderware Corporation • 26561 Rancho Parkway South, Lake Forest, CA 92630 • Tel: (949) 727-3200 • Fax: (949) 727-3270
www.wonderware.com

PN 15-0096 Rev. 3/03