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Diagnostic Software Stimulates Accurate, Timely Decisions

This component-based troubleshooting and diagnostic system is said to consolidate large amounts of manufacturing information in a format that enables technicians to quickly find exactly what they need.

Article from: Modern Machine Shop
Posted on: 10/14/2009

Blurring the lines between the virtual world and the physical world? Sounds like science fiction. Actually, however, this is the phrase Ken Tock uses to describe a suite of analytical and diagnostic software tools designed to help engineers find needed information when the pressure is on.

Mr. Tock is president of MacKintok Information Architects and Designers, a small software developer in Syracuse, New York. Having cut his teeth in automotive plants, steel mills and other manufacturing facilities, Mr. Tock understands the importance of minimizing downtime. When a machine goes down, the faster an engineer can get to the information needed to diagnose and correct the problem, the faster that machine will be humming again and contributing to the bottom line.

MacKintok's system is designed to do just that—consolidate a large amount of manufacturing data in a format that enables users to quickly and easily find exactly what they need. How this is done is what sets the system apart, Mr. Tock says. "We construct our system just like a machine tool manufacturer builds machines," he explains. "All the components interact, just like in the real world."

For users, this means no more time spent scouring through lengthy technical manuals. No more navigating through complicated menu structures in Web-based and other digital systems. No more dealing with unorganized data scattered in different places throughout the shop, or, for that matter, picking technicians' brains for important but undocumented information that might be "locked up" there. Rather, an intuitive graphical interface allows immediate access to all relevant information for not only a specific machine component, but also all other devices with which it interacts.

Click Image to Enlarge

Rolling the mouse cursor over any component in an IntelliDrawing (the schematic visible in the background) brings up an image of that component. Clicking the image brings up the component's CID portal, which contains specifications, troubleshooting procedures, and other associated information.

At the core of the system is the Component Information Display (CID) Module, which acts as the gateway to all information for a particular machine. Through this interactive interface, users can access various tools designed to provide technicians with all the information needed to assist them during the decision-making process. Perhaps the most straightforward of these tools are CID Portals, each of which corresponds to a particular machine component. Each portal contains all data relevant to its particular component, including technical specifications; fault codes; troubleshooting, maintenance and other procedures; and drawings, diagrams, animations and videos.

Designed to enhance the capabilities of the CID Module and CID Portals, Intelli-Drawing Viewer Modules provide the user with a visual walkthrough of the machine's circuits and schematics, detailing how components are interconnected and how each relates to the manufacturing process. More specific information on a particular device is available by simply clicking the component in the drawing to bring up its associated CID portal. This is especially useful for troubleshooting, Mr. Tock says. Intelli-Drawings, CID Portals and other available tools are accessible through the CID Module, which can be launched from a CD, the Web or a hard drive.

"The way we see it, our systems are more of a tool than a reference," Mr. Tock explains. "They're designed so that when users go out with their toolboxes, they're taking not only wrenches and gages and so forth, but also one of our systems. The goal is to not only get them the information faster, but also to display it in a way that helps stimulate their thought processes to solve problems."

Systems are typically custom-built to accommodate clients' individual needs, Mr. Tock says. The fact that the system is component-based makes it easy to define the scope of a project because a given machine has only so many components, he points out. For example, working with a bill of materials as a reference, MacKintok and the customer can decide whether to implement a simple overview of a machine's hydraulic system or to dig all the way down to its O-rings or other such components.

Once the fundamental layout of the system is completed, typically with the aid of documentation and schematics from the machine's original manufacturer, the company works with customer personnel to obtain additional information. "We show the customer the flow of the system, and they'll be able to answer questions about troubleshooting processes that might not be documented elsewhere," Mr. Tock says. "Bringing information that's locked up in an expert's head and putting it into the system makes it useful for everyone from apprentices to engineers."

In fact, the system is useful for more than just diagnostics, Mr. Tock notes. Some customers, for example, use it as a training tool because the system provides a digital replica of how a given machine is constructed in the real world. The ability to incorporate animation and video of specific machine components makes this especially effective, he says.

Mr. Tock has big plans for the future. Most notably, a partnership with MT Connect could transform the role of the system from a diagnostic and analysis tool to a more automated, active participant in the troubleshooting process. Developed by AMT—The Association for Manufacturing Technology, MT Connect is a set of open standards for transmitting data between machine tool CNCs and other factory equipment. Wide adoption of the new standard could ease the cost of implementing diagnostic tools that can interface directly with machine controls to obtain up-to-date information on the fly, Mr. Tock says.

"Right now, our products don't really give you the answers to problems; they provide the information needed to solve problems," he explains. "If we can communicate with controls and get real-time data coming from the machine—fault codes, for example—that could trigger the system to bring up information needed to solve that fault. It could automatically target problem areas, rather than leaving it to the user to figure out. While this is potentially way down the road, it's a logical next step for us."

Example Of A CID Module

Follow this link to peruse an actual CID Module developed for one of MacKintok's customers: http://www.mackintok.com/m1067_corepull/web/m1067_301.html

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