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How DMC Senior Engineers Reclaim up to 8 Hours a Week Using Copia Automation

Leading control system integrator also credits Copia for accelerating onboarding of new hires and scaling quality

DMC pairs young engineers with mentors to meet demand.

Since 1996, engineering consulting firm DMC has helped hundreds of clients improve the productivity of their manufacturing facilities with custom automation software and control systems. With engineering offices in 13 U.S. cities, DMC's impact is stamped across a wide array of products, including automobiles, food and beverages, and even Navy battleships.

According to Project Director John Sullivan, who oversees the automation business for the western United States, the need for DMC services has never been higher. "At times, we've had to reluctantly turn down work because demand outpaced our ability to hire and train controls engineers fast enough," he says.

Sullivan's candid industry snapshot is underscored by a new Control Systems Integrators Association (CSIA) survey showing aggressive hiring of systems integration engineers in 2021, but also a 16.5% turnover rate across the field.

The biggest bottlenecks are onboarding new talent and best leveraging the use of senior engineers' time. Software engineering students typically specialize in more common text-based programming languages versus the visual ladder logic diagrams used to program PLC computers for machine automation. Consequently, young engineers need to be paired with experienced mentors for training that can take months.

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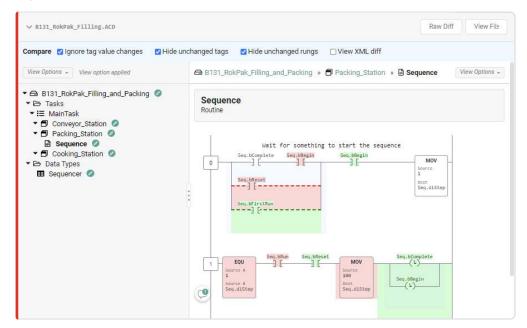>
> **John Sullivan**
> Project Director
> DMC

At DMC, where software projects can range from a solo programmer up to 25 engineers, the summers tend to have larger teams when new talent can learn from their experienced colleagues. Senior engineers' schedules quickly get filled with frequent design reviews. By winter, says Sullivan, smaller teams become more prevalent as college grads are more able to work on their own.

To streamline its design review process, version control, and collaboration, DMC relies on Git-based Copia Automation software, which accelerates development for multiple PLC programming environments. Copia enables teams to concurrently work on the same files without the risk of overwriting each other's work. Powerful Git branching and merging capabilities bring the same collaboration benefits to ladder logic programming as text language projects.

Copia's visual diffing with comments provides easy-to-read, color-coded comparisons that don't require reviewers to download and open files within the original Integrated Development Environment (IDE).

DMC code reviewers can detect and fix mistakes earlier.

Sullivan says Copia's automatic rendering of PLC programming languages and the ability to quickly visualize changes, without using the original IDE, significantly speeds up the feedback loop between junior and senior engineers.

Copia accelerates code reviews by displaying PLC ladder logic and highlighting the changes between commits, in a web browser or desktop app.

"When leading multiple projects, our senior engineers are saving up to a day a week, because of the faster code reviews," he says. "Plus, we're reviewing more frequently. We're catching more mistakes before they get deployed or tested. And because we always see the visualized code before merging, we're also making fewer mistakes."

Sullivan says DMC's recent switch to Copia from traditional Git has made his team much more efficient.

"Git alone does a good job managing the project history but falls short when reviewing code," Sullivan says. "Whenever someone committed a code change, our senior engineers needed to open up two copies of the development environment, do a compare between the two platforms, and manually copy the code before recommitting."

"Copia does not rely on the original development environment to visualize the changes. We now see the changes right away and simply click a few buttons to merge those changes. A 45-minute process now takes 15 minutes," he adds.

Copia's version history and the "10 year problem"

Copia Automation's Git-based version history captures all coding changes for the lifecycle of a project, allowing teams to revert to any earlier iteration if desired. The edit history is invaluable for collaborating team members to be aware of the latest project changes, but it is also useful for managing what DMC calls the "10 Year Problem."

The challenge is maintaining the ability to provide ongoing support for machines and systems long after installation.

"I recently heard from a customer who we last worked with us seven years ago. Both the engineer and the manager who worked on that project are gone. It's so important to always be able to find the files from legacy projects," says Sullivan. "I had another customer who had a power surge, and they lost their program. They unfortunately never managed to keep a copy of it. So we needed to grab old code and help them redeploy to a new set of hardware so they could get back up and running."

"Now, with Copia, moving forward, anyone on our team will be able to handle the 10 Year Problem without the original engineer who worked on the project. Having the context and information from the entire lifecycle of a project is super valuable," he adds.

Having a single source of truth in a secure central repository also helps the DMC team collaborate more efficiently with its manufacturing clients.

"We have customers operating facilities where their engineers are making small code changes on a regular basis. When things really go wrong, they call us," Sullivan says. "And it's our job to jump in and help figure out the problem. One of the keys to being successful is to be confident we have the latest code. Sharing the same Copia repository enables this."

Sullivan says he thinks it's "embarrassing" for the industry to still be relying on file names and shared folders.

"If your automation team is looking to increase productivity and quality, Copia is easy to learn and easy to adopt," he says. "I can't imagine ever going back to the old way of doing things."

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