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ORGANIZATION
Teledyne Technologies Incorporated – a leading provider of sophisticated electronic components and subsystems for the avionics industry.

CHALLENGE
Revamp the Teledyne Controls LSE application to accommodate the specifications of the newer generation aircraft, which features advanced networked technology never seen before in the commercial avionics industry; create a workflow process to automate the execution of changes and updates during the airplane maintenance cycle.

STRATEGY
Have a highly skilled team of system architects and developers to evaluate, re-engineer and extend the LSE platform; create a workflow process that takes into account multiple geographies, hierarchies, and management groups; work with in-house Teledyne Controls experts to answer questions and ensure the project is completed on-time and within budget.

SOLUTION
The Advanced Process Management module for LSE is an add-on application capable of supporting the management of newer generation aircraft. Visus delivered the product, along with a workflow to support it, within the budget and timeline established by Teledyne Controls.

RESULTS
Teledyne Controls completed in time its Advanced Process Management module, the most robust product offering of its kind. The workflow process created by Visus is currently a part of the new LSE product offering.

Teledyne Controls is a leading provider of end-to-end solutions designed to help operators increase flight safety and operational efficiency through more efficient aircraft data and information management. With extensive experience working closely with civil and military operators worldwide, Teledyne Controls has developed a range of products that fit together to provide end-to-end solutions and deliver greater benefits to their customers.

One of Teledyne Controls' leading products is the LSE (LoadStar® Server Enterprise) application. LSE is a configuration management system that helps aircraft maintenance personnel to manage the configuration, storage, and electronic distribution of software throughout an airplane. It is widely used to manage onboard hardware and software assets for airlines with large fleets of planes. It is also an efficient tool to track any changes made to electronic components throughout a plane—a job that is orders of magnitude more complex with newer aircraft generations.

Preparing for Takeoff

Director of Data Loading Solutions at Teledyne Controls Don Ruffing and his team found themselves up against a tight deadline to create an Advanced Process Management module that would extend the LSE environment to work with the new generation of planes. It was a tall order as this new venture would require extensive new code.

"Since LSE's inception, we've never had to make changes this big," said Senior Systems Engineer and LSE architect Thom Loomis. "We could have done it in-house, but it would have taken so much of our resources that we would have been forced to put all of our other software development projects on hold."

> "Visus supplied skilled resources along with the knowledge and expertise we needed to get the job done on time. They were a tremendous asset to our staff."
>
> – Thom Loomis, Senior Systems Engineer, Teledyne Controls

To support their project, Teledyne Controls found Visus LLC, an enterprise software development company based in Santa Barbara, California.

"Visus had the right resources we needed to get the job done," Loomis said. "They supplied skilled resources and were a tremendous asset to our staff."

Making a Tight Connection

Because of the inherent complexity of the new LSE module and the tight turnaround time for the project, three Visus developers traveled to Teledyne Control's facility in Thousand Oaks and spent three weeks hashing out the requirements with the in-house engineers—a decision that helped Visus get up to speed quickly and develop a first hand knowledge of the existing software environment and the new complex requirements for LSE. They systematically worked through the requirements and developed a workflow

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process to structure the new configuration management system.

"The Visus team was very flexible, and they had a good group of program managers and engineers who readily apprehended our needs, understood the project, and worked closely with us to create the right solution," says Ruffing. "They understood all of the development technologies we use and they got up to speed fairly quickly with our systems and procedures."

Visus and Teledyne Controls went through the system piece-by-piece to determine which elements they would need to update LSE. They carefully evaluated each section of the LSE software environment, reengineered it, and then used Microsoft .NET, C#, Javascript and other technologies to develop the new Advanced Process Management module.

"Visus' expertise was evident from the outset of this project," Loomis says of the interaction. "They were able to integrate those concepts with what we already had in place, and that was not a small task. It's always easier to start from scratch than it is to reengineer an existing system."

Visus also created a workflow process to help maintenance personnel interact with the system in a coherent way. "One of the reasons we selected Visus was for their workflow expertise," says Loomis. "They brought a lot of knowledge to the table, and they helped us forge ahead with that portion of the project."

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> – Don Ruffing, Director Data Loading Solutions, Teledyne Controls

For example, Visus examined how a change order would move through a large organization like Southwest Airlines , which has its headquarters in Texas but also has distribution centers and hubs all over the country. Most change orders are routed through a variety of staff including aircraft mechanics, IT professionals, avionics engineers, quality assurance teams and project managers. The workflow system carefully tracks each request from initiation to approval, alerting the pertinent members of the maintenance team, prompting them for input as required, and maintaining a log of each part of the process for auditing purposes.

Reaching Cruising Altitude

Ruffing says the new Advanced Process Management module addresses all of Teledyne Controls's concerns and was completed within the target timeframe and budget laid out by the company. Thanks to the rapid development cycle, which lasted about 12 weeks from initial consultations to final completion, they are now the only company with such a robust diagnostic tool in widespread use among major airlines.

Ruffing summed up the project by noting that "the Visus team worked side-by-side with our in-house engineers to make sure everything ran smoothly. They offered innovative ideas that still worked within the existing framework of LSE. They were flexible, professional, and accommodating, and we look forward to working with them on future projects."

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