

Smarter Robotics and Proven Performance Wins Government Contract

Insitu Inc.

Specializing in the design, development, production and operation of unmanned aircraft systems (UAS) for intelligence, surveillance and reconnaissance (ISR) objectives; Insitu Inc., has been a global leader in the UAS industry since 2004. Insitu's small, robotic, pilotless aircraft are used in a wide range of military and aerospace applications in both government and commercial markets.



Background

Starting in 2002-2003, Insitu began participating in government demonstrations, and in 2004 they were awarded a contract with the Marines to provide surveillance video for convoy and base protection for operations in Iraq and Afghanistan. In 2006, Insitu responded to a government proposal requiring CMMI Level III compliance within 9 months. In spite of this, the team was confident they could achieve the goal, even though they understood their current engineering solution was unable to address the compliance issues and was limited in scope. This compliance requirement, as well as the need for a comprehensive integrated solution that could scale to meet growing demand, led Insitu to embark on a trade study of application lifecycle management (ALM) tools.

Challenges

Insitu's UAS are the culmination of the integration of a variety of systems, and software which is central to that integration. Software is included not only in the aircraft systems themselves, but also in the communication software that links the aircraft to ground control, as well as the software on the ground that flies the plane, controls the payload and points the camera— involving image processing control and communications and networking algorithms. It is this software that makes the aircraft “smarter”. In a high precision, safety-sensitive system such as this, the software may have hundreds of specifications related to safety contingencies, increasing complexity.

The aggressive timetable of the government proposal necessitated a tool that would be easy to learn and use, but comprehensive enough to meet all engineering requirements. As Insitu looked to the future, they were faced with many challenges including:

- Meeting CMMI Level III compliance in 9 months
- Finding a tool that is easy to learn and use
- Coordinating and syncing complex software-related functions of the UAS — including the aircraft navigation, video feeds, ground control and communications — as an integrated system
- Demonstrating compliance with safety requirements using end-to-end traceability through the development process
- Creating a single software package per release, including all auto pilot code, payload code and ground station code — hundreds of specifications that must be tested and traced back to original requirements
- Providing product status to customers in a single unified report
- Enabling the iteration of different software components at different times, allowing safety related features to be updated at a slower cycle to ensure safety requirements are met

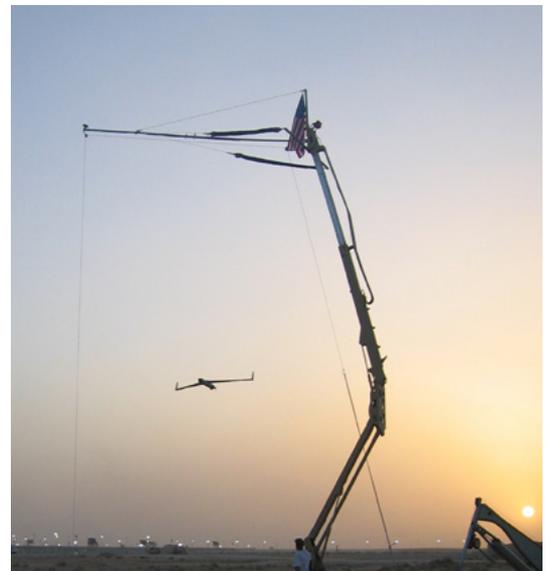


- Integrating requirements management, traceability, change management, specifications and test plans so customers are confident that what is delivered, meets specifications
- Accommodating customer's Waterfall requirements while still enabling Insitu's development goal to evolve to a Scrum methodology
- Providing IBM Rational DOORS integration to support customer requirements documents, requiring customization through an API

Solution

As the Insitu team progressed through the evaluation process, they discovered many vendors offered a piece of the solution such as requirements management or test management, but what they really wanted was an "all-in-one" solution — a single tool that could record and manage all the engineering artifacts. After an evaluation of 16 vendors, pared down to a more detailed study of four, PTC was selected as the vendor whose product, PTC Integrity, addressed all Insitu's challenges in a single solution with these key advantages:

- Ease of use – software developers were able to learn the tool in a very short timeframe using only the manual
- Integrated solution – including requirements management, traceability of requirements, defect management, user stories, change control, creation of specifications and test suites
- Easy retrieval of information - customizable role-based reports provide a single coherent picture of development status
- Demonstrate compliance – easily trace a vast and varied mix of specifications and change requests from-end-to-end
- Single software package per release - merges all software code and allows each of these software components to easily iterate at different times
- Address requirements – DOORs database integration and support for Waterfall documents





Results

- Achieved CMMI Level III compliance in fewer than 9 months
- Awarded a DoD contract for ScanEagle® ISR services
- Able to pursue larger government contracts and programs
- Overcome software complexity enabling all of Insitu's software modules to work cooperatively together for effective operation of the UAS.
- Scale to meet customer demand without additional headcount
- Customization and flexibility allow reporting for a range of audiences
- PTC Integrity easily evolves to meet changing requirements and company growth initiatives
- Easily verify that a range of products meet individual customer's product specifications

For more information, please visit: [PTC.com/products/integrity](https://www.ptc.com/products/integrity).

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