INNOVATION
Technology with Demonstrated Relevance

Air Force SBIR/STTR

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Air Force flight simulators, like the one pictured here, rely heavily on third-party software. With support from the Air Force SBIR/STTR Program, Massachusetts-based Silverthread Inc. developed a software tool to assist acquisition managers to mitigate risks in evaluating software proposals. (Air Force photo by Will Graver, 711th Human Performance Wing/Warfighter Readiness Research Division)

A BETTER SOFTWARE AQUISITION
SOLUTION ON THE HORIZON

The Air Force will soon have access to technology that helps identify design quality issues – which tend to drive cost and schedule overruns – in proposed new software-based systems.

With support from the Air Force Small Business Innovation Research/Small Business Technology Transfer Program, Massachusetts-based Silverthread Inc. developed a software tool to assist acquisition managers in evaluating software proposals. The idea is to provide better insight during the acquisition process to mitigate risk, and improve financial and operational performance.

The tool is also designed to boost cyber security resiliency in software and help the owning organization avoid being locked into a specific vendor.

The Air Force Life Cycle Management Center Simulators Program Office awarded a Phase III contract to Silverthread based on its Air Force SBIR Phase I effort – a rare achievement –and the technology is projected to go into use in the summer of 2019. Phase III denotes funding from outside the Air Force SBIR/STTR Program and is a critical commercialization benchmark.

BEHIND THE TECHNOLOGY

Some key systems, such as Air Force flight simulators, rely heavily on third-party software. The result is that acquisition professionals often make source selection decisions – sometimes for multi-decade, multi-billion dollar systems – based solely on information provided by businesses about the software they are offering in a bid proposal.

For example, many offerors assert their software to be easily sustainable because it employs an open or modular architecture. However, until recently there was no easy way for these assertions to be verified or potential issues to be identified.

Recent research shows that a software code base can now be analyzed without operational knowledge of the entire code base. Essentially, this method employs a commercial-off-the-shelf software call extractor to identify the dependencies within lines of code, which are then arranged for further analysis. This allows calculations that provide insight into the nature of dependencies. Significant cost savings are possible when code bases are architecturally healthy.

Through the Air Force SBIR/STTR Program, Silverthread was tasked to validate and demonstrate a tool that would analyze software architecture to understand its propagation cost and core size. These two metrics can shed light on the long-term sustainability of the software, both in terms of cost and time to sustain, as well as the veracity of proposer claims.

SBIR SUPPORT MADE THE DIFFERENCE

Under the SBIR project, Silverthread worked with the Air Force Research Laboratory 711th Human Performance Wing to interview a variety of specialists. This provided insight into complex simulator systems, which was critical to understanding how the tool set needed to evolve to meet the needs of the Air Force and other potential Department of Defense customers.

The project also allowed Silverthread to understand the different types of people who will use the data. As a result, the company plans to provide different views of the data to support decision making for different roles and levels.

Additionally, Silverthread leveraged its experience with the Air Force SBIR/STTR Program to expand the tool set beyond Air Force requirements for acquisition review to provide warnings for software developers when paired with other tools.

Company officials expect both of these developments to drive additional military and commercial sales.