

Unlocking Africa's aerospace and defence potential

Through global computer software and services specialist, PTC, local distribution partners productONE and 1Worx continue to work with African Aerospace and Defence (A&D) manufacturers to place them at the forefront of innovation by providing leading CAD, PLM and IIoT solutions.

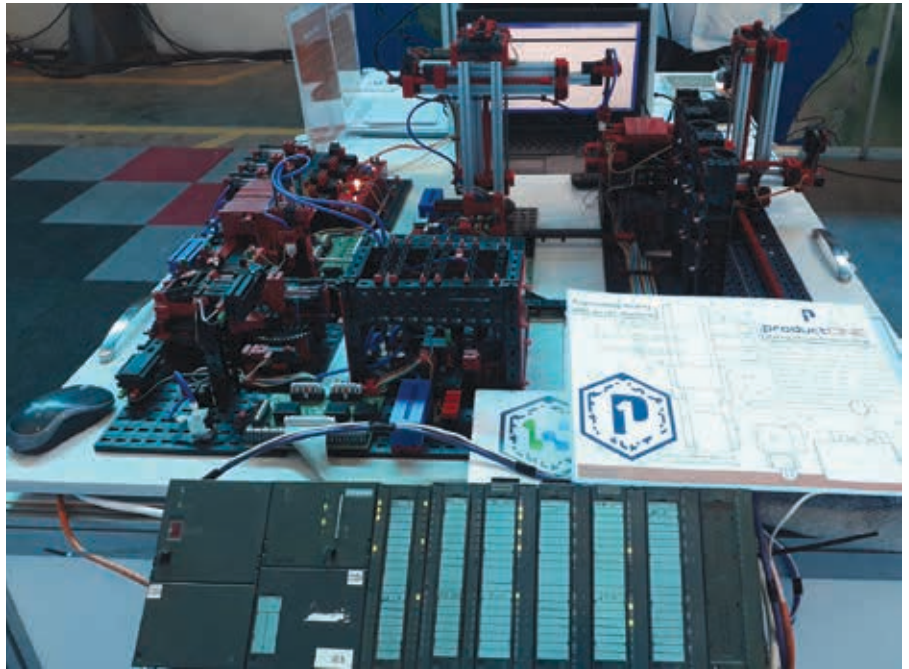
With a view to unlocking aerospace and defence product development potential using disruptive technologies for smart connected products and operations, productONE and 1Worx are positioning the idea of connecting the physical and digital world to allow Africa to leapfrog traditional economies.

"Due to the growing need for anytime, anywhere access to information, the key to setting yourself apart from the competition rests in your ability to strategically use this information to gain sustainable business growth. Having the right technology solutions is a vital first step in the process," says Charles Anderson, MD of productONE, speaking at the recent AAD 2018 exhibition held at the Waterkloof Airforce Base in Pretoria.

productONE Solutions, a Level 2 B-BBEE contributor, along with sister company, 1Worx, are striving to enable aerospace and defence manufacturers to gain actionable intelligence into their products and operations. At AAD 2018, practical examples of solutions based on the Industrial Internet of Things (IIoT), Machine Learning, the digital twin and Topology Optimisation as well as 3D CAD and Augmented Reality (AR) were displayed.

To showcase the Industrial Internet of Things and how aerospace and defence companies can turn their factories into intelligent and dynamic environments, an impressive miniature smart factory demonstration was developed. "Using PTC's ThingWorx IIoT Platform, businesses will now have the capabilities needed to build and extract value from smart, connected operations; drive new revenue streams, optimise business processes and differentiate their product and service offerings," says Johan Bester, IoT Application Engineer at 1Worx.

Machine Learning and predictive analytics have a powerful impact on the way factories of tomorrow (and today) can be managed. A simple light bulb demonstration portrayed a real-world example of the benefits of forecast-based maintenance as well as having real-time, unified visibility into factory



Above: An impressive miniature smart factory developed using PTC's ThingWorx IIoT Platform demonstrates the capabilities needed to build and extract value from smart, connected operations.



Left: productONE's Product Insight demonstration uses a 3D-printed bomb retrieval arm designed using topology optimisation.

operations. These benefits include reduced downtime, improved productivity, and increased flexibility. The bulb experiment used simple failure rate statistics collected over a short period of time to more accurately predict when a bulb was likely to need replacing.

"The benefits of having the ability to observe and interrogate products after they leave the factory floor are now unprecedented," Thulani Mazibuko, principal applications engineer at productONE, suggests.

Using a 3D printed bomb retrieval arm to showcase the convergence of the physical and digital world, productONE's Product Insight demo demonstrated a very practical example of how businesses can connect real-world IIoT data to designs, thereby creating digital twins of their real-life products. "No matter where the physical product is, its usage can now be remotely tracked, from anywhere using your smart device," he adds.

This Arm also displayed the benefits of topology optimisation. "Design transcends just pure aesthetics. It also considers the efficiency of the product in the field. Take an aircraft, for example; careful consideration must be given to the design of ultra-light yet strong structures. PTC's Creo Topology Optimisation extension allows designers to define objectives and constraints, such as minimum strength, then the software creates

an optimised, parametric geometry for you, giving you the absolute lightest weight while still meeting the strength objective required," Thulani explains.

Product design remains at the heart of Industry 4.0 applications. Before any product can be made smart, it needs to be designed and developed first! PTC's CAD software, Creo, has made great strides in the Aerospace and Defence industry, adding the design of the award winning Cirrus Vision Jet (a pioneering invention in the field of personal jets) to its successful product development arsenal. When coupled with augmented reality, product development becomes a truly transformative experience. Using the Vuforia Studio platform, Aerospace and Defence companies can use AR to intelligently guide owners through essential daily maintenance tasks, such as aircraft pre-flight checks and so much more.

"Imagine experiencing your designs at scale without creating a physical prototype. Imagine having the capability to fluently explain and share ideas with stakeholders regardless of language, educational level or even geography. Augmented reality has the ability to do all of this with the added benefit of shortening design cycles, bringing products to market faster and increasing overall productivity," Anderson concludes. □