Value Driven Engineering
Data Analytics and Audit System

Steve Kumpf, Manufacturing Engineer

Ben Naylor, Manufacturing Engineer
Biography

Global Product Data Interoperability Summit | 2018

**Steve Kumpf**
Steve began his professional career as a manufacturing engineer with the former Global Aeronautica (GA). During that time, Steve had many roles including: ME Lead for the Wing to Body Fairing commodity; ME Core Team Lead; 1 year Temporary Manager for ME Core. When Boeing officially acquired GA in 2009 (Boeing South Carolina established), Steve was instrumental in helping GA transition to Boeing systems, processes, and tools during the "Get to Common" project. In his current role, Steve is working for Production Engineering and leading BSC in the 2nd Century Enterprise Systems (2CES) initiative. Steve holds a Bachelor of Science in Mechanical Engineering from the Rochester Institute of Technology (RIT), and also a Masters of Business Administration from RIT.

**Ben Naylor**
Ben Naylor is a Manufacturing Engineer at The Boeing Company on the 787 airplane program. In 2014, Ben relocated to South Carolina and joined the Final Assembly Derivatives team as the lead for 787-10 development. Using the skills and knowledge gained during the -9 development program, Ben led the -10 Final Assembly ME team to a successful introduction of the next 787 derivative. Ben was named Boeing South Carolina 'Engineer of the Year' for 2015 for his efforts leading this team. Prior to starting with The Boeing Company in 2010, Ben worked as an application engineer for Wastech, an industrial waste treatment system company, and as an electrical engineer for California Instruments, a programmable AC and DC power supply company. Ben graduated cum laude from Bloomsburg University of Pennsylvania in 2006 with a BS in Electronics Engineering Technology.
Many independent software tools used throughout the value stream that are disconnect from one another and also do not enforce company established processes.

This opens up the risk of “bad data” being created and propagated through the value stream.

Software (COTS and Internally Developed) Processes

Risk area for “bad data” creation
How do we prevent “Bad Data”?  

Traditional methods of preventing bad data include software and process audits, usually performed manually for functional “core” personnel.

Software (COTS and Internally Developed)  

- EBOM  
- MBOM  
- SBOM  
- ERP  
- Workflow  
- Scheduling  
- MES

Processes  

As Designed  
As Planned  
As Built

Risk area for “bad data” creation
How do we prevent “Bad Data”?

Ideal Solution
Stand alone software functionality would be connected and not allow users to violate published business processes.

Connected software tools that programatically enforce business processes

- EBOM
- MBOM
- Workflow
- Scheduling
- ERP
- MES

As Designed
As Planned
As Built
How do we prevent “Bad Data”? 

Ideal Solution Drawbacks
- COTS solutions cannot meet all process needs
- Highly customized and very $$$$
- Analysis time constraints
- Process variability – different programs have different business needs and requirements

Connected software tools that programmatically enforce business processes

[Image of a diagram showing EBOM, ERP, MBOM, Workflow, Scheduling, SBOM, MES, As Designed, As Planned, As Built]
How do we prevent “Bad Data”?

Our Approach
Mantis Database collects data from COTS and Internally Developed software and evaluates against processes en masse. Alerts users of process violations and directs them on how to fix them. Also allows for on-demand reports to be created.

Software (COTS and Internally Developed)

Processes

Mantis

As Designed

As Planned

As Built
What makes Mantis different than any other internally developed reporting and auditing tool?

Mantis is an Employee Managed Program (EMP) meaning it is not an IT managed resource.

ME Core personnel write SQL code to develop the analytics which drive the audits and on-demand reports.

Audits detect errors that will affect products that not yet built so we can prevent disruptions to production.

This enables audits to be created quickly and accurately due to the high familiarity with the processes and tools being audited.

This also allows a high degree of flexibility as processes and business objectives change and evolve.
Mantis has become a platform that employees outside of ME Core who are interested in learning SQL can get involved with and start developing audits of their own.

Training class developed and offered for employees to learn SQL programming language.

Other functions using the system outside of Manufacturing Engineering, including Liaison Engineering, Design Engineering, Change Management, and more.
Mantis fits into Boeing’s AnalytX strategy and will be incorporated into Boeing’s 2nd Century Engineering Systems (2CES) initiative.

Finding the balance between Employee Managed and IT Managed Program

Pros of EMP

- Fast, agile, flexible development
- Rapid prototyping of audits, reports, and improved internal software systems

Cons of EMP

- Personnel fluctuation
- Lack of experience in development
- Alignment of EMP with Production Engineering strategy and future tools
Questions?