Digital Thread Shipbuilding - Supplier Interface
Navy ManTech Project
March 12, 2019
DCN# 43-5003-19

Brett Cash
Manager, iDS Supplier Integration
Supply Chain Management
ManTech Project

- Digital Thread Shipbuilding – Supplier Interface
- Contract awarded in February 2018
- Period of Performance Feb’18 – Mar’20
- Strategic Focus Areas:
  - Simplified Technical Data Packages
  - 3D Design Disclosures
  - Secure Data Exchange

ONR: Paul Huang – Program Officer
NSAM: Dale Orren – Deputy Director
Tim Macon – Project Manager
Dick Tiano – Project Technical Representative

PEO Carriers:
Eric Pitt – Chief Technology Officer
Howard Franklin – Program Office

Newport News Shipbuilding:
Tammy Rossi – ManTech Program Manager
Traci Jones – Project Lead
Brett Cash – Technical Lead
Newport News Shipbuilding

Founded 1886
Rivets to Welding
Nuclear Power
Next Reinvention
The world is changing **fast**.

- When was the last time you used a paper map?
- New customer behavior is driving new business models.
  - Advertising: 14% on mobile next 3 years
  - Amazon buys Whole Foods
  - Uber disrupts taxi industry
- **Speed** is the new currency.
The next generation of shipbuilders.

- Tech-savvy
- Constant access to information
- Expect speed and agility
- Desire meaningful work – leave their mark
“This shouldn’t be complicated to build.”

Here is the paper work package to build it.
Drawing Sheet Kitting
Visual Work Instructions

Digital step-by-step work instruction that includes:

• 3-D product model data

• Step-by-step task instructions

• Product manufacturing information, such as:
  ▪ Weld information
  ▪ Compartment numbers
  ▪ Dimensions and tolerances
  ▪ Frames and reference lines
Supplier Integration
Opportunities

Simplified Technical Data Packages
• Provide clear and concise requirements that are specific to the material being purchased
• Reduce the amount of time required to estimate, plan, manufacture, and inspect
• Improve the first-time quality of parts and assemblies being purchased

3D Design Disclosures
• Clearly convey design intent, requirements, and instructions
• Reduce supplier notifications identifying design errors or requesting clarification
• Prevent suppliers from having to develop their own 3D CAD models to produce parts

Secure Data Exchange
• Enable efficient two-way transfer of data with suppliers
• Increase speed and efficiency by reducing the need to mail or fax information
• Establish the framework for more effective collaboration with suppliers
Simplified Technical Data Package (TDP)
Simplified TDP

Purchase Order

- Part Description
- Supplemental Description Notes
- First-tier Specifications
- Sub-tier Specifications
- Drawings / Sketches
- Inspection Reports
- Coded Notes
- Procurement Appendices
Subtask 3.1
Select a subset of Coded Notes and Appendices

Subtask 3.2
Deconstruct requirement documents into BOTs

Subtask 3.3
Determine NLP feasibility

Subtask 3.4
Develop system logic

Subtask 3.5
Determine AI feasibility
# ASME B16.9 Copper-Nickel Fittings

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Simplified TDP (cont’d)

ASME B16.9 Copper-Nickel Fittings

- Applied data engineering techniques to obtain part number dataset ready for analysis by machine learning methods.
- Used these methods to induce decision trees (DTs) over dataset. Investigated multiple DT induction algorithms.
- Obtained two DTs (one of which is shown at right) that correctly assign coded note packages to part number test sets, with 100% accuracy.
3D Design Disclosure

Visualization

CAD / CAM

- Buyers
- Estimators
- Planners
- Craftsmen
- Inspectors
- Logistics Support
- Designers
- Engineers
- CNC Programmers

Clearly convey design intent and support CNC machining
Three drawings, plus supplemental modification documents, are needed to build one door assembly.

Applicable notes are scattered amongst multiple documents.

Parts list format requires research to compile an assembly BOM.

Single views are often used for multiple assembly configurations.

Example: NAVSEA Hull Closures
Secure Data Exchange and Collaboration

• Suppliers access engineering technical data in HTML 5 format
• Hosted in a secure cloud environment
• Collaborate during design development and manufacturing
Secure Data Exchange and Collaboration (cont’d)
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