Welcome to the Team SUB Small Business Sustainment Technology Showcase

We will begin at 0845 EDT
Team Submarine
FY20 Small Business Sustainment Technology (SBST) Virtual Showcase
Small Business Tech Talk Room #1
Advanced Manufacturing

SUB DAC | NAVSEA 00K
16-17 September 2020
TEAM SUB
FY20 Small Business Sustainment Technology (SBST) Showcase

MELD: Large Scale Metal Additive Technology
MELD Manufacturing Corporation

SEPT 2020
MELD Manufacturing Corporation
Problem Statement

MELD Manufacturing Corporation, a Woman-Owned Small Business, is the inventor and sole-offeror of the MELD process, a patented and award-winning, large-scale metal additive technology.

Our experienced, passionate team has successfully developed MELD from concept to a mature process that is well positioned to bring an immediate and impactful benefit to the warfighter. We can enable the use of advanced materials, improve logistics, and bring this revolutionary technology to the fight.

Presenter Contact Information:
Chase D. Cox, Ph.D., Director of Technology  
Chase.Cox@MELDManufacturing.com
MELD Manufacturing Corporation
Problem Statement

PROBLEM

Metal Additive Manufacturing is limited.

- Too slow
- Too expensive
- Too unreliable
- Too restricted
- Too small
- Too limited
MELD Manufacturing Corporation
Problem Statement

MELD can do what others cannot.

Too slow MELD is 20-30 POUNDS per hour in Aluminum

Too expensive MELD is one step instead of three, is open atmosphere instead of in a vacuum, and uses regular metal instead of expensive special metal

Too unreliable MELD is simple and results are predictable and repeatable

Too restricted MELD can process any metal, including all the ones other processes can’t

Too small MELD measures in meters, not millimeters

Too limited MELD can repair existing parts
The **MELD** tool and feedstock material are rotated while applying downward forces resulting in the plastic deformation and subsequent deposition of the feedstock material.
MELD Manufacturing Corporation
Technology Solution / Potential Applications

BUILD IT

<table>
<thead>
<tr>
<th>Material Property</th>
<th>As-Printed MELD Ti6-4</th>
<th>ASTM B381 / B265 Minimums</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Strength (MPa)</td>
<td>909.7</td>
<td>828</td>
</tr>
<tr>
<td>Ultimate Tensile Strength (MPa)</td>
<td>1049.7</td>
<td>895</td>
</tr>
<tr>
<td>Elongation (%)</td>
<td>13.2</td>
<td>10</td>
</tr>
</tbody>
</table>

Encapsulated ceramic tile + a non-encapsulated tile for reference
Encapsulated ceramic tile with MELD logo cut out to reveal tile
Demonstration of multi-tile array for armor application

PEO Submarine Distro Statement A
REPAIR IT

MELD Manufacturing Corporation
Technology Solution / Potential Applications

Cast AZ91 Magnesium helicopter gear box rib fracture previously unrepairable due to non-fusion weldable properties of Mg. MELD enables the opportunity to repair otherwise unrepairable damage of high-cost components.

In Certification Process: MELD Repair of Cast Magnesium Gearbox Housing

location of worn surfaces

Al7075 Missile Launcher Rails
# MELD Manufacturing Corporation

Current Status / Next Steps

## MELD MACHINE MODELS

<table>
<thead>
<tr>
<th></th>
<th>B8</th>
<th>L3 (new model, information not yet public)</th>
<th>K2</th>
</tr>
</thead>
</table>
| Cubic build space | 3ft³ 
0.085m³, 85K cm³ | 6.75 ft³ 
0.191m³, 191K cm³ | 81.6ft³ 
2.31m³, 2,310K cm³ |
| Build volume (x, y, z) | 36in x 12in x 12in 
91.4cm x 30.5cm x 30.5cm | 36 in x 18 in x 18 in 
91.4cm x 45.7cm x 45.7cm | 82in x 43in x 39in 
208cm x 109cm x 99.1cm |
| Table size | 42in x 18in 
106.7cm x 45.7cm | 51 in x 23 in 
129.5cm x 58.4cm | 86in x 43in 
218cm x 109cm |
| Overall dimensions (footprint) L x W x H | 10ft x 11ft x 11ft 
3.05m x 3.35m x 3.35m | 10.2 ft x 7.6 ft x 13.3 ft 
3.11m x 2.32m x 4.05m | 20.5ft x 15.3ft x 14.5ft 
6.25m x 4.66m x 4.42m |
Demonstration of Benefits:

- **Quality:** Deposit fully-dense material with exceptional mechanical properties (near-wrought or better), greater corrosion resistance, and greater wear resistance
- **Scalable:** Repair small to massive components with fast deposition rates (Al > 20 lbs/hour)
- **Easy to Use:** CNC style machines and g-code allow one-day retrain of machinists
- **Unlimited use:** Repairs the unrepairable, welds/joins dissimilar metals
- **Open Atmosphere:** Print MELDed material directly onto existing structures/components
- **Safe:** No gas, no lasers, no metal powder means safe and portable

Approach:

MELD is a solid-state process for all metal alloys, including those that are incompatible with fusion processes. By remaining well below the melting point of a given material MELD is able to process materials without the problems experienced with melt-based processes such as porosity and hot-cracking.

MELD machines are commercially available today. This is a high TRL/MRL process.

Deployable AM/Repair Process:

- MELD machines are large-scale, open-atmosphere systems that do not require a laboratory environment for reliable operation. These machines are robust and durable and are well suited for deployment in either a depot or forward operating base environment.
- MELD machines have high utility, whether on a robotic arm for large repair or stationary platforms for manufacture of replacement parts.

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Metal Additive Manufacturing, Made Open
Open Additive, LLC

SEPT 2020
Open Additive, LLC
Problem Statement

• Company: DUNS 117237443 / Beavercreek, Ohio / www.openadditive.com
• Presenter: Dr. Ty Pollak / President / tpollak@openadditive.com

• Problem Statement

Major barriers impede the adoption and proliferation of metal additive manufacturing (AM) to meet DON modernization & sustainment needs. These barriers include:

☒ High system acquisition/support costs
☒ Vendor lock on processing strategies
☒ Closed architecture restrictions
☒ Limited process validation tools
☒ Significant facility and safety impacts
Open Additive, LLC  
Technology Solution / Potential Applications

• **Technology Solution**  
  • Open-architecture metal 3D printers with integrated sensors/analytics

• **Potential Applications / User Segments**  
  • R&D labs developing AM processing/monitoring/control technologies  
  • Providers of specialized AM services to meet mission requirements  
  • Sustainment organizations (depots, shipyards, manufacturing technology centers) using AM for obsolescent or cost-prohibitive parts/components  
  • CONUS, OCONUS, and forward locations needing onsite metal AM  
  • Industrial base entities supporting DoD-agency programs
Open Additive, LLC
Development Path

First testbeds to customer sites in 2018

SBiR III system to NASA, Sep 2018

“Open Additive” product shows 2019

First commercial deliveries in May 2019

Redesigned PANDA™ platform, 4 system sales first half of 2020

$4M of new DoD contracts on large-format, next-gen platforms
• **Army xTech SBIR I**
  Large-format, low-cost AM for Army applications (in contracting)

• **Air Force Commercial Solutions Opening**
  C-130 program office demo (FA8688-20-C-0004 / $150k / 12 months)

• **Air Force SBIR II/II.5**
  Large-format, quad-laser platform (FA8650-20-C-5007 / $3M / 27 months)
  Large-format system for test facility (FA9101-20-C-0026 / $750k / 27 months)

• **NASA STTR I/II/III**
  Delivery of prototype Phase III system and sensor suites (2015-2019)

• **DLA SBIR/STTR/RIF**
  >$5M ongoing projects executed by partners on sensing/analytics
Open Additive, LLC
Fully Commercialized PANDA™ System

BUILD CHAMBER
- Standard Volume: 6.0 x 6.0 x 9.5 in
- Large Volume: 11.0 x 11.0 x 12.5 in
Add-ons:
- Removable small-area sleeve
- Heated build plate

ENVIRONMENTAL CONTROL
- Inert gas chamber
- Cross-bed flow
- Optics gas flow
- Integrated filtration
- Sensors and control

CONVENIENT POWDER CATCH
- No-mess powder collection
- No scooping required

LASER & OPTICS
- Standard Configuration:
  - 500W IPG Yb-fiber laser
  - SCANLAB galvo with f-theta lens
  - Z-stage for focus adjustment
- Advanced Options:
  - Dual laser
  - Dynamic focus control
  - 1,000W laser upgrade
  - Pulsed laser

CONTROL SOFTWARE
- User-friendly interface
- Full parameters control
- Advanced processing tools
- Multiple hardware control
- Plug-in capabilities
- Perpetual license

SYSTEM DIMENSIONS
- Standard configuration fits through 32”-wide single door
- 1” = 25.4 mm
Open Additive, LLC
Process Monitoring with AMSENSE®

- **Integrated multi-sensor data collection & analytics**
  - Available on PANDA and 3rd-party systems
  - Modular sensing/analytics capabilities
  - Enables future analysis plug-ins and feedback controls

**TOMOTHERM™**
Thermal tomography & data visualization

**SPAT-TRAK™**
Automated spatter identification & tracking

**Recoat Imaging**
Automated capture before/after each recoat

PEO Submarine Distro Statement A
Open Additive, LLC
Product Line Vision

Application-Driven Metal AM System Solutions!

Hardware Options
Build Size • Lasers/Optics • Heating • Powder Deposition

Control Software Features
Basic • Advanced • Custom Tool Path • Feedback

Integrated Sensors & Analytics
Build Sensors • Machine State • Environmental • Plug-Ins

Materials Process Recipes
Standard Alloys • Specialty Materials • Data Repository

Ancillary Equipment
Powder Handling • Part Handling • Automation • Safety

Configurable Open-Architecture Platforms

PANDA™
Commercially Available Small Format (<12")
Dual-Platter Design R&D/Education/Services

GRIZZLY™
In Development Large Format (to 24"+)
Single-Platter/Hopper Large/Many Parts

System of Systems / Novel Configurations

Applications
Training & Education
Research & Technology Development
Applications Development
Prototyping & Low-Volume Production
High-Volume Production
Unique Parts & Repairs

Application Requirements

PEO Submarine Distro Statement A
Open Additive, LLC
Current Status / Next Steps

• **Current Status**
  - PANDA™ platform (to 11”) fully commercialized – 5 orders placed
  - GRIZZLY™ platform (to 24”) in work thru AF “commercial readiness program”
  - AMSENSE® use cases under study, new analytics in development
  - Complete containerized demo on contract (2021 demo with AF parts)

• **Next Steps**
  - Understand DON needs and use cases
  - Initiate application demonstrations
  - Transition systems to field
Open Additive, LLC
Questions?

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>BENEFITS</th>
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</thead>
</table>
| Metal additive manufacturing (AM) offers tremendous promise for “on-demand” manufacturing to meet DoD modernization & sustainment needs... **but major barriers impede adoption/proliferation of metal AM solutions:**  
- High system acquisition/support costs  
- Vendor lock on processing strategies  
- Closed architecture restrictions  
- Limited process validation tools  
- Significant facility and safety impacts | Affordable, versatile AM tailored to application needs  
- Lower costs than comparable industrial options (~3-for-1 pricing)  
- Open approach allows scaling to need, with open materials and parameters  
- Integrated sensors/analytics allow “digital thread” and process control strategies  
- Demo underway for complete containerized solution for worldwide use |

**TECHNOLOGY SOLUTION**

Open Additive, LLC, has launched the first “open systems” laser powder bed fusion (LPBF) product line  
- Multiple build sizes and configurable lasers/optics  
- Open software with control of all process parameters, including plug-in capabilities for tool path control  
- Integrated multi-sensor data collection/analysis suite for “digital thread” and emerging process controls  
- No materials restrictions, safe for reactive powders  
- Spurred by SBIR/STTR & fully commercialized (TRL 8)

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Thank You

PEO Submarine Distro Statement A
TEAM SUB
FY20 Small Business Sustainment Technology (SBST) Showcase

Light Weight Composite Components for Naval Systems
Pacific Engineering Inc.

SEPT 2020
Problem Statement

• NAVSEA/Objective Guidance
  • Corrosion is a main driver in high sustainment
  • Need to reduce ships time to complete maintenance availabilities
  • Traditional Industrial Base has shrunk
  • Support the Wartime Acquisition Scalable Plan
  • The nation’s economy needs increased products – “Made in America

• Talk to Us:
  Rear Admiral Osie V. Combs Jr., USN Ret., PEI President
  Dexter E. Myers, PEI SVP, 626-379-2282
Technology Solution for Navy HM&E needs:
- Utilize Advanced light weight composite parts
- PEI does design, fabrication and testing
  - Fire resistance resins
  - Low smoke and low Toxicity
  - Bonded Structures
  - Filament Winding
  - Hand Lay-up
  - Resin Infusion (RTM, VARTM)
  - Compression Molding

Potential Applications:
- Navy/Team Sub
  - Virginia Class, Seawolf Class, Columbia, SSN(X) adaptable launch canisters for VPM, MK 48, fairings, external and internal partitions, structural components, propulsion train components
- Navy/Team Ships
  - PEO USC ships (FFG(X), LUSV, MUSV, etc.)
  - PEO Ships (DDG 51 etc.)

Reduces weight, longer service life and reduces the need for maintenances due to the non-corrosive material.
• PEI has had made recent advancements in composite technology that have shown that structures designed and manufactured our advanced marine composite materials are able to meet/exceed performance requirements such as shock (MIL-STD-901D), ballistic protection, vibration, abrasion, and environmental requirements; achieving performance and cost goals for launch canister design.

• Pei marine materials developed under NAVSEA SBIR, light weight, improve interfacial bonding, and improved toughness meet shock requirements

• Use of composite materials provide enhanced corrosion resistance, resulting in greatly reduced maintenance, downtime, longer service life and lower sustainment costs

Composite VPM canister design results in weight reduction (as much as 40%)
# Technology Solution Example

## Adaptable and Universal Composite Canister system for the Virginia Payload Module

**AUCC**

<table>
<thead>
<tr>
<th>Technology Feed/SBIR</th>
<th>Current SBIR(s)</th>
<th>Technology Application</th>
<th>Benefit</th>
<th>Near</th>
<th>National Interest*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBIR PH II</td>
<td>AUCC</td>
<td>Tougthened Marine</td>
<td>Weight</td>
<td>VPM</td>
<td>Deliver more from</td>
</tr>
<tr>
<td>Composite Canisters</td>
<td>Phase II</td>
<td>Composite Resins with</td>
<td>reduction</td>
<td>Scalable for other</td>
<td>underwater platforms</td>
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<tr>
<td>for PMS-415 SSTD</td>
<td>TRL-5</td>
<td>higher strength</td>
<td>Effective against corrosion</td>
<td>other diameters; such as 30</td>
<td>Increased payload</td>
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<td></td>
<td>Reduces TOA</td>
<td>inches</td>
<td>carrying capability</td>
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<td></td>
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<td>Adaptable</td>
<td>Multiple</td>
<td>New submarine</td>
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<td>Leverages</td>
<td>platform</td>
<td>submarine weapon</td>
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<td>existing</td>
<td>launcher for</td>
<td>systems;</td>
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<td>equipment</td>
<td>family of</td>
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<td>Faster</td>
<td>UxS from</td>
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<td></td>
<td>accommodation</td>
<td>submarines</td>
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</table>

**Major Force multiplier within 2-3 years**

*Tactical Submarine Evolution Plan dated 1-19-18*
Pacific Engineering Inc.
Operation Need & Improvement

- System Need(s):
  - All Submarines need adaptable launch canisters for Payload Module to allow adaptability to launch different unmanned systems (UxS) and reduce its associated maintenance cost while extending service life.
- Technology Gap(s): PEI is developing an Adaptable and Universal Composite Canister (AUCC) system – 1st application is the Virginia Payload Module
  - Enable load-out of a variety of payloads in same VPM
  - Lower the overall cost of developing separate unique canisters for each payload by accommodating a variety of Missile, UUVs, UAVs, etc.
    - Provide a standardized electronics interface between the Common Weapon Launcher (CWL) and the payloads
    - Enhance force projection in same mission by permitting missiles and UxS in same VPM

BENEFIT/PAYOFF/ROI:
Increased Capability
/Longer service life/Payoff: Reduced maintenance/ROI: Costs Savings
Composite materials have Proven Past Performance:
  • Composite Launch Canister for Countermeasure Anti-Torpedo Torpedo (CAT)
  • PEI designed, tested, production canisters fielded on USS Bush

Next Steps
  • Apply our technology to new POR’s in PEO SUB
  • Dry Dock Shelter
  • Fairings
  • Sonar Hull Arrays
  • SOF berthing and ancillary modules
  • External Stows
  • Masts
  • Decks
  • Enclosures
  • Galley equipment
PROBLEM

• Extend part/system service life and reduce sustainment and maintenance costs across the fleet.
• Eliminate corrosion, reduce weight, and reduce life cycle costs
• Reduce the time subs are in maintenance availabilities

TECHNOLOGY SOLUTION

• Use of light weight, toughened, composite materials provide enhanced corrosion resistance, resulting in greatly reduced maintenance, downtime, longer service life and sustainment costs
• Composite structures and canisters designs result in weight reduction (as much as 40%)

BENEFITS

• Structural Composite parts provide:
  • Non-corrosive
  • Lighter weight
  • Meets Fire/Smoke/Toxicity requirements
  • Meet Shock requirements
  • Reduces Total Ownership Costs
  • Utilized in propulsion system parts, fairings, sail covers, hull sonar structures, non-structural bulkheads gratings, seawater tanks, decks, ladders, hatches, berthing, mess hallway, Dry Dock Shelter L&R parts

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Innovative Reverse Engineering Capabilities Utilizing AM
Elevan LLC dba Elevate Systems

SEPT 2020
Elevate Systems
Innovative Reverse Engineering Solutions

Elevate Systems is an innovative engineering design firm that specializes in reverse and re-engineering services resulting in non-proprietary technical data.

Problem Statement:
• Most legacy systems cannot procure the needed parts and components due to unavailability of technical data and drawings, OEMs not in business anymore or just uncooperative.
• Elevate Systems focuses on these types of issues and provides reverse engineering services that result in the identification and qualification of new manufacturing sources as well as all technical data being provided with unrestricted and unlimited data rights.
Elevate Systems
Technology Solution / Potential Applications

• Technology Solution:
  • Utilizing the newest metrology technology we are able to reverse engineer mechanical assets using infrared touch point scanning with augmented reality overlays to .0003 accuracy.

• Potential Applications:
  • Every Legacy Platform can utilize our technology
  • Example: B-52 Stratofortress Radar Blower Motor Assembly
    • We reverse engineered 1950’s technology and utilized additive manufacturing for an impeller which was originally over 80 separate parts. This impeller spins at 11,000 RPM and is printed in Ultem 9085.
    • Cost for impeller dropped from $10K to $3,500 to $280!!
    • Radar Blower Motor Assy now flying on over 60 planes today.
Elevate Systems
Digital Twin Examples

CH-47 Chinook TESS Antenna Mount Kit
First OTA Contract

UH-60 Blackhawk Sump Housing 2D to 3D Stress Analysis for Cold Spray Repair
Elevate Systems
Digital Twin Examples

AH-64 Apache
Mast Base Support 2D to 3D Stress Analysis for Cold Spray Repair

HH-60H
Port/Starboard Gatling Gun Mount RE New Source Qualification
Elevate Systems
Sustainment/Obsolescence Examples

WC-135
Whole Air Collection System (WACS)
TT&E using AM for Tooling

E-3 AWACS
Electronic Flight Bag (EFB) Design & Prototyping to Install and add Real Time ADS-B Data Securely
First SBIR Contract
Elevate Systems
Current Status / Next Steps

• Current Status:
  • Currently Supporting multiple legacy systems with this technology today for the US Navy, Army and Air Force
  • Additive Manufacturing is not for everything – has to be a viable candidate
  • Must utilize firms that have extensive knowledge of reverse engineering techniques, extensive 3D solid modeling capability as well as Geometric Dimensioning and Tolerancing

• Next Steps
  • Have more weapon systems be aware of this technology and utilize it

Eleven LLC dba Elevate Systems
1919 NW Loop 410, Suite 200
San Antonio, Texas 78213
210.807.9981
www.elevatesystems.com
CAGE CODE: 6TTF1

SBA 8(a) Certified
Economically Disadvantaged Woman Owned Small Business (EDWOSB)
## Elevate Systems

**Questions?**

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- OEMS are not responsive</td>
<td>- Unlimited and Unrestricted Data Rights</td>
</tr>
<tr>
<td>- OEM Proprietary drawings and data cannot be used</td>
<td>- All Technical Data Developed (drawings/3D models/native CAD Files/prototypes)</td>
</tr>
<tr>
<td>- No drawings are available</td>
<td>- Identification and Qualification of new manufacturing sources (traditional/3D)</td>
</tr>
<tr>
<td>- No technical data is available</td>
<td>- The ability to support the systems until end of life</td>
</tr>
<tr>
<td>- There are no qualified sources for the parts we need</td>
<td></td>
</tr>
<tr>
<td>- We can’t locate or purchase the needed parts</td>
<td></td>
</tr>
</tbody>
</table>

## TECHNOLOGY SOLUTION

- Elevate Systems is NOT a manufacturer
- We specialize in reverse and re-engineering mechanical systems/components and parts using state of the art metrology technologies resulting in extremely accurate digital twins
- We develop the technical data necessary to qualify new sources of supply
- We inject advanced technologies (like 3D printing) where practical
- We are experts at 3D modeling and analysis

1950’s Impeller Hand Crimped, Hand Riveted and Balanced, Reverse Engineered, Printed in Aluminum and then Ultem 9085. Flying today on over 60 B-52s

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3D Scanning for Digital Twins and so Much More

Direct Dimensions, Inc.
Baltimore, MD

SEPT 2020
Direct Dimensions, Inc.
Problem Statement

• Direct Dimensions, Inc. (DDI) provides Rapid Solutions to 3D Problems

• DDI is one of the oldest and most capable 3D scanning services and product solutions companies in the U.S. with over 25 years of hard-core 3D scanning and reverse engineering projects widely across the DoD sector and more.

• DDI developed and is now deploying the STAVE 3D scanning and analysis solution for the digital measurement of shaft tapers in the four Navy shipyards.

• Presenter: Michael Raphael, Founder & CEO, 30-year 3D scanning pioneer

• Problem Statement:
  • The Navy must maintain legacy equipment designed before 3D CAD. DDI provides services and solutions for the full spectrum of size and complexity to reverse engineering parts and systems into 3D CAD. We are brand-agnostic and have developed special DoD-funded automated 3D solutions.
Direct Dimensions, Inc.
Technology Solution / Potential Applications

• Technology Solution:
  • Full Spectrum 3D Scanning Solutions with best-in-class capabilities
  • Featuring:
    • High accuracy long range scanning for vehicles & facilities
    • Rapid deployment handheld scanning for incidents & intelligence
    • Ultra-high accuracy close-range scanning for reverse engineering
    • Purpose-built automated high-volume parts scanning system providing rich 3D data for supply chain & counterfeit part analysis

• Potential Applications:
  • Digital Twin modeling for re-manufacturing, design, analysis, retrofit, etc.
  • Supply Chain analysis for sourcing, analysis, additive manufacturing, etc.
  • Dimensional Inspection and analysis for design conformity, fitment, QC.
  • Counterfeit detection of electronic components via rich color visual 3D
  • Current engagements with Navy shipyards for critical propulsor interface inspection and DLA for automated 3D part visualization database
  • Currently working with DoD, Industry, Arts & Museums, and Hollywood
Direct Dimensions, Inc.
Current Status / Next Steps

• Current Status:
  • DDI is 25-year best-in-class provider of 3D scanning services & equipment
  • Large staff dedicated to 3D solutions, long history with DOD & Services
  • Ready for rapid deployment to help solve 3D dimensional challenges

  • Developing unique automated small part 3D capture system under DLA OTA
  • Deployed test unit to DLA Depot, captured 100+ parts in 2 days, all modeled into 3D and loaded into partner system providing 3D part search & analysis
  • Deployed 2nd gen system to commercial stockroom; customer-operated
  • Complex small parts, circuit boards, etc. captured in 2 minutes with auto-created 3D color model with sub mm dimensional accuracy

• Next Steps
  • 11 months into 1-year DLA OTA Contract for System R&D (COVID-delayed)
  • Multiple deployments to DLA Depot for real world testing & development
  • DLA OTA mod in process for acquisition of 2 systems for DLA Depots
  • Completed 400+ parts for commercial company in manufacturing stockroom
  • Working to secure pilot project at major museum in Washington DC
### PROBLEM

- *Digital Twins* provide 3D digital data for problem solving and avoidance.
- 3D scanning is about capturing parts and spaces in the real world to create 3D digital data for design, analysis, visualization, and manufacturing.
- With so much demand for digital design, analysis, and fabrication, and with so little of the physical world in digital form, 3D scanning enables engineers, designers, and fabricators to accurately blend reality into digital.
- How do you get your real-world parts and spaces accurately into 3D for subsequent design, analysis, visualization, or manufacturing?
- More importantly, what challenges do you have solving dimensional issues with parts, assemblies, structures, vehicles, gear & equipment?

### TECHNOLOGY SOLUTION

- For over 25 years, Direct Dimensions has provided advanced 3D scanning services and products for capturing physical objects and facilities into 3D digital formats for a variety of applications from aerospace, automotive, art and architecture to museum, military, medical and movies.
- We are located near Washington DC in Owings Mills, MD
- We have over 25 highly skilled and experienced technical staff.
- We represent, sell, train, and support a variety of 3D scanning solutions including long range, handheld, high accuracy and other COTS 3D scanners.
- We provide both services and products to support Navy 3D digital needs.

### BENEFITS

- Direct Dimensions has unparalleled skill and experience for ‘reverse engineering’ complex legacy part & assembly hardware into 3D CAD.
- We provide project-based support and have performed 1000’s of projects.
- We own, use, support, and represent a wide range of 3D scanning equipment and software for virtually all types of scanning problems.
- We use the best equipment for the project and can therefore recommend the best solutions for your projects, including custom automated solutions.
- We’ve worked with groups in the Navy and many other DoD organizations around the country for most of our 25-year history.
- We look forward to working with you too!