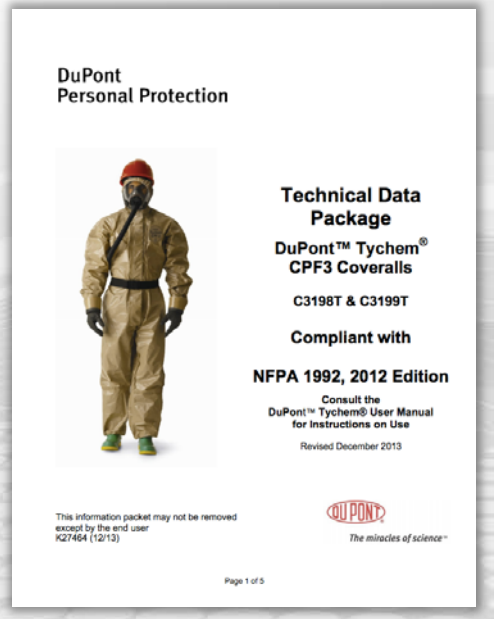
TOWARDS A BETTER (MODERN) TDP with 3DPDF

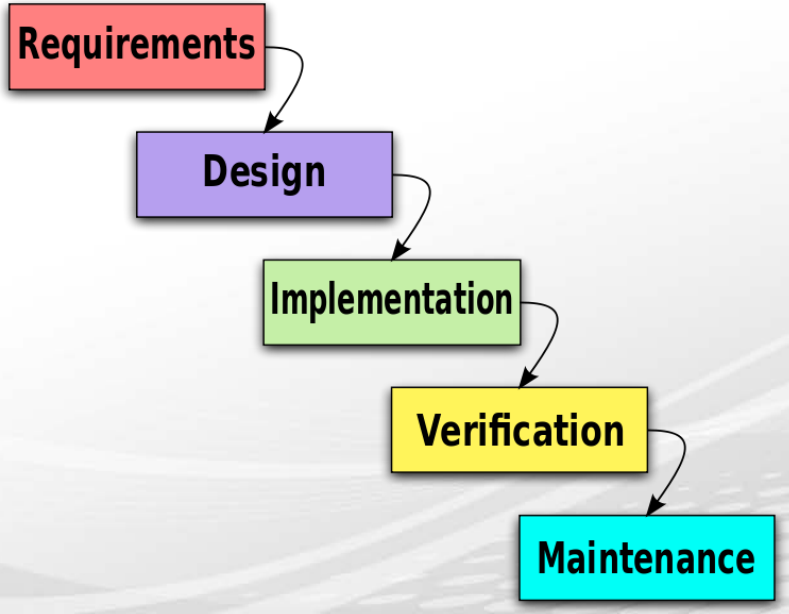
A New Way of Communication

Agenda

- TDP overview
- TDP evolution
- Modern TDP
- Construction of a modern TDP
- Demo
- Q&A



What is a Technical Data Package?

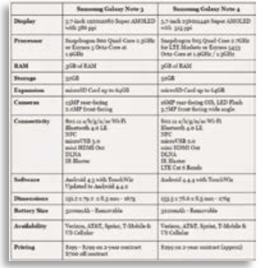


- Geometric description (form)
- Product Manufacturing Information (fit)
- QA requirements
- Material specifications
- Reliability data
- Maintenance specifications
- Manufacturing process and tooling data
- Packaging
- Performance requirements
- Certifications
- Other product definition data

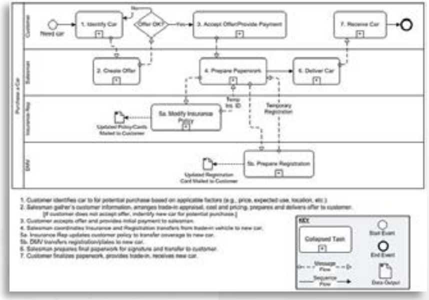
Why are TDP's important?

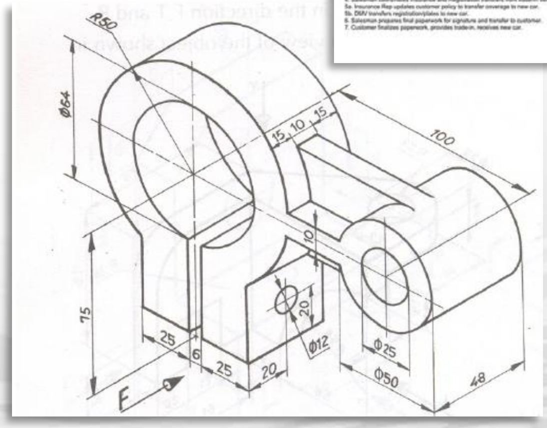
- Second source manufacture
- Operate, train, maintain, repair
- Spares provisioning
- Overhaul / upgrade / refit
- Replacement manufacturing

Once upon a time (Phase 1 TDP's)

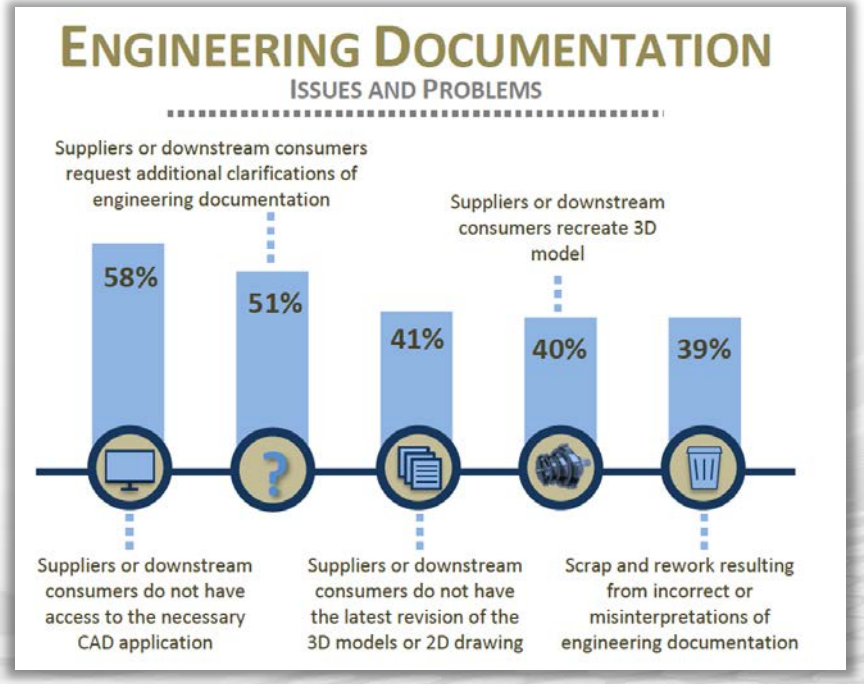


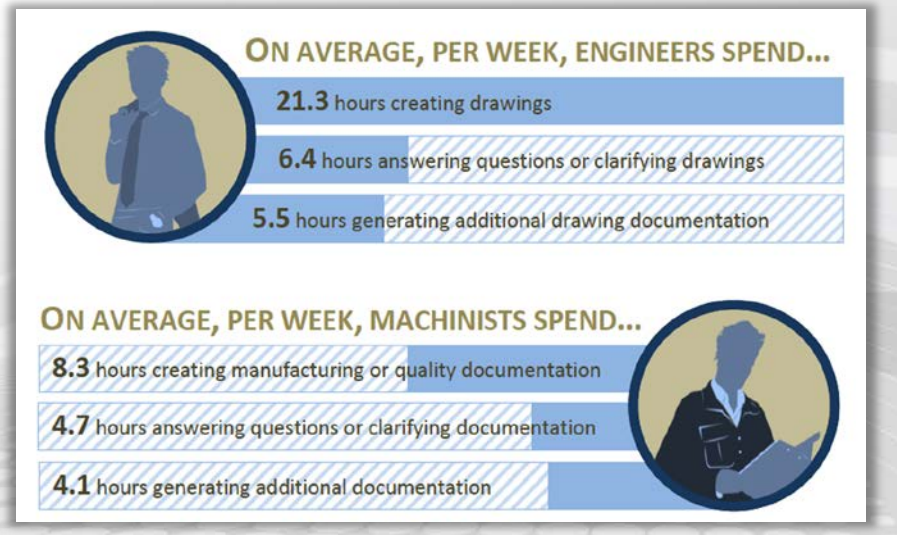
	Samsung Galaxy Note 3	Samsung Galaxy Note 4
Display	5.7-inch 1920x1080 Super AMOLED with 386 ppi	5.7-inch 2560x1440 Super AMOLED with 515 ppi
Processor	Snapdragon 800 Quad-Core 2.3GHz or Exynos 5 Octa-Core at 1.9GHz	Snapdragon 805 Quad-Core 2.7GHz for LTE Markets or Exynos 5433 Octa-Core at 1.9GHz / 1.3GHz
RAM	3GB of RAM	3GB of RAM
Storage	32GB	32GB
Expansion	microSD Card up to 64GB	microSD Card up to 64GB
Cameras	13MP rear-facing 2.1MP front-facing	16MP rear-facing OIS, LED Flash 3.7MP front-facing wide angle
Connectivity	802.11 a/b/g/n/ac Wi-Fi Bluetooth 4.0 LE NFC microUSB 3.0 mini HDMI Out DLNA IR Blaster	802.11 a/b/g/n/ac Wi-Fi Bluetooth 4.0 LE NFC microUSB 2.0 mini HDMI Out DLNA IR Blaster LTE Cat 6 Bands
Software	Android 4.3 with TouchWiz Updated to Android 4.4.2	Android 4.4.4 with TouchWiz
Dimensions	151.2 x 79.2 x 8.3 mm - 168g	153.5 x 78.6 x 8.5 mm - 176g
Battery Size	3200mAh - Removable	3220mAh - Removable
Availability	Verizon, AT&T, Sprint, T-Mobile & US Cellular	Verizon, AT&T, Sprint, T-Mobile & US Cellular
Pricing	$299 - $199 on 2-year contract $700 off contract	$299 on 2-year contract (approx)





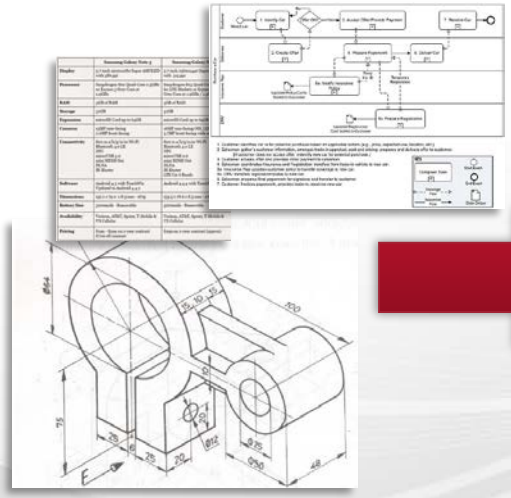
Issues with ~~TDP's~~ technical documentation





Source: Lifecycle Insights. The 2014 State of Model Based Enterprise Report.

Electronic delivery! (Phase 2 TDP's)

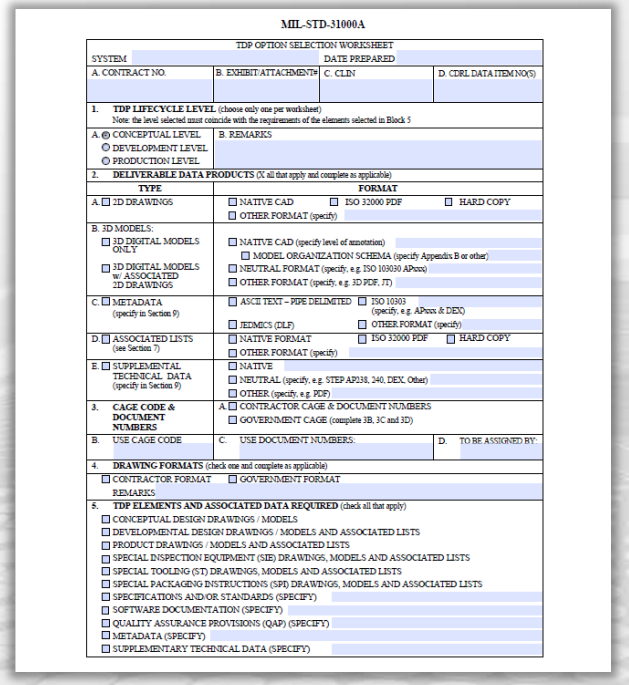


What did we gain?

- More efficient information exchange
- Better management of documentation
- Traceability
- ~~Clearer, more concise communication~~

PDF – One “container” ubiquitously accessible

- TDP form itself
- 2D Drawings
- 3D Models of any type
- Metadata
- Associated documents
- Supplemental data



MIL-STD-31000A

TDP OPTION SELECTION WORKSHEET

SYSTEM | DATE PREPARED

A. CONTRACT NO.	B. EXHIBIT/ATTACHMENT#	C. CLIN	D. CDRL DATA ITEM NO(S)

1. **TDP LIFECYCLE LEVEL** (choose only one per worksheet)
Note: the level selected must coincide with the requirements of the elements selected in Block 5

A. ◉ CONCEPTUAL LEVEL ○ DEVELOPMENT LEVEL ○ PRODUCTION LEVEL	B. REMARKS

2. **DELIVERABLE DATA PRODUCTS** (X all that apply and complete as applicable)

TYPE	FORMAT
A. ☐ 2D DRAWINGS	☐ NATIVE CAD ☐ ISO 32000 PDF ☐ HARD COPY ☐ OTHER FORMAT (specify)
B. 3D MODELS: ☐ 3D DIGITAL MODELS ONLY ☐ 3D DIGITAL MODELS w/ ASSOCIATED 2D DRAWINGS	☐ NATIVE CAD (specify level of annotation) ☐ MODEL ORGANIZATION SCHEMA (specify Appendix B or other) ☐ NEUTRAL FORMAT (specify, e.g. ISO 10303 APxxx) ☐ OTHER FORMAT (specify, e.g. 3D PDF, JT)
C. ☐ METADATA (specify in Section 9)	☐ ASCII TEXT – PIPE DELIMITED ☐ ISO 10303 (specify, e.g. APxxx & DEX) ☐ JEDMICS (DLF) ☐ OTHER FORMAT (specify)
D. ☐ ASSOCIATED LISTS (see Section 7)	☐ NATIVE FORMAT ☐ ISO 32000 PDF ☐ HARD COPY ☐ OTHER FORMAT (specify)
E. ☐ SUPPLEMENTAL TECHNICAL DATA (specify in Section 9)	☐ NATIVE ☐ NEUTRAL (specify, e.g. STEP AP238, 240, DEX, Other) ☐ OTHER (specify, e.g. PDF)
3. **CAGE CODE & DOCUMENT NUMBERS**	A. ☐ CONTRACTOR CAGE & DOCUMENT NUMBERS ☐ GOVERNMENT CAGE (complete 3B, 3C and 3D)

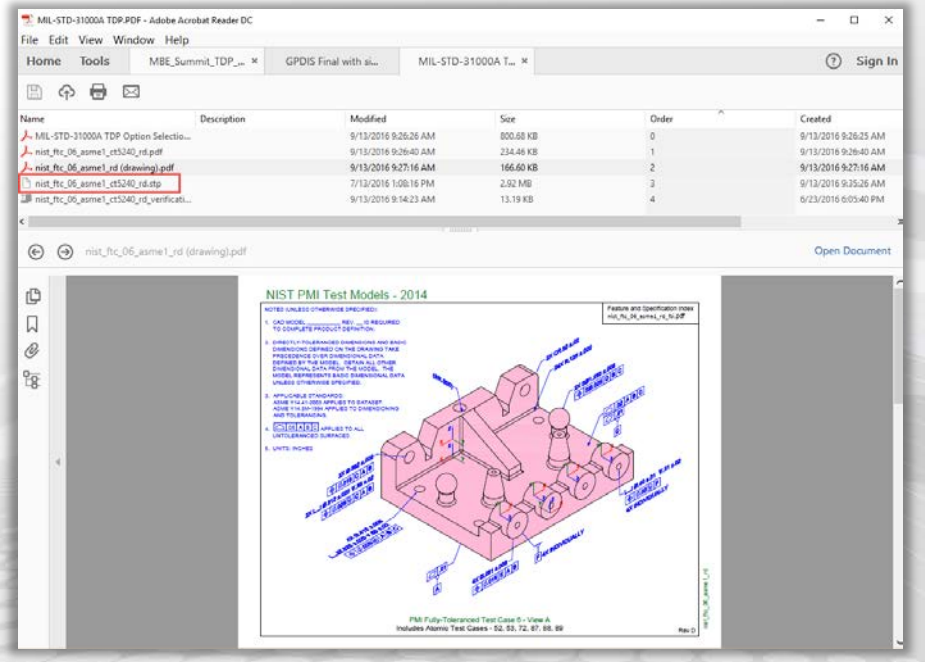
B. USE CAGE CODE	C. USE DOCUMENT NUMBERS:	D. TO BE ASSIGNED BY:

4. **DRAWING FORMATS** (check one and complete as applicable)
☐ CONTRACTOR FORMAT ☐ GOVERNMENT FORMAT
REMARKS

5. **TDP ELEMENTS AND ASSOCIATED DATA REQUIRED** (check all that apply)
- ☐ CONCEPTUAL DESIGN DRAWINGS / MODELS
- ☐ DEVELOPMENTAL DESIGN DRAWINGS / MODELS AND ASSOCIATED LISTS
- ☐ PRODUCT DRAWINGS / MODELS AND ASSOCIATED LISTS
- ☐ SPECIAL INSPECTION EQUIPMENT (SIE) DRAWINGS, MODELS AND ASSOCIATED LISTS
- ☐ SPECIAL TOOLING (ST) DRAWINGS, MODELS AND ASSOCIATED LISTS
- ☐ SPECIAL PACKAGING INSTRUCTIONS (SPI) DRAWINGS, MODELS AND ASSOCIATED LISTS
- ☐ SPECIFICATIONS AND/OR STANDARDS (SPECIFY)
- ☐ SOFTWARE DOCUMENTATION (SPECIFY)
- ☐ QUALITY ASSURANCE PROVISIONS (QAP) (SPECIFY)
- ☐ METADATA (SPECIFY)
- ☐ SUPPLEMENTARY TECHNICAL DATA (SPECIFY)

PDF Portfolio with 3D Model (Phase 3)

- **PDF “portfolio” allows inclusion of attachments**
- **Container provides seamless transmittal**
- **Consumption of model not provided within PDF**
- **External app may or may not be available!**



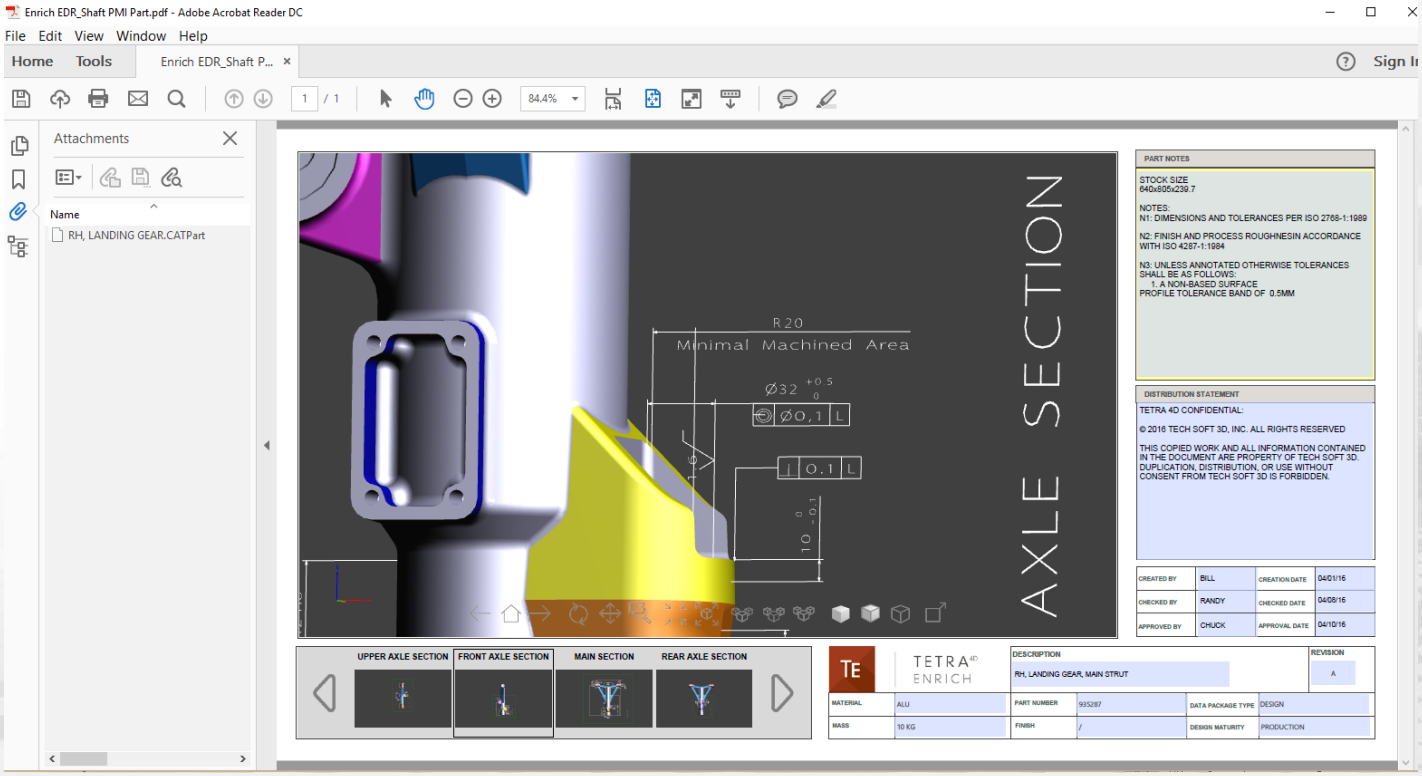
Model-Based Definition (MBD) and TDP's

- **MBD users**
  - **Build ½ the number of prototypes**
  - **Shorten development cycle by 30% - 50%**
  - **Reduce non-conformance issues by 30%-40%**

(40% of non-conformance issues are due to 2D drawing inaccuracies and ambiguities)

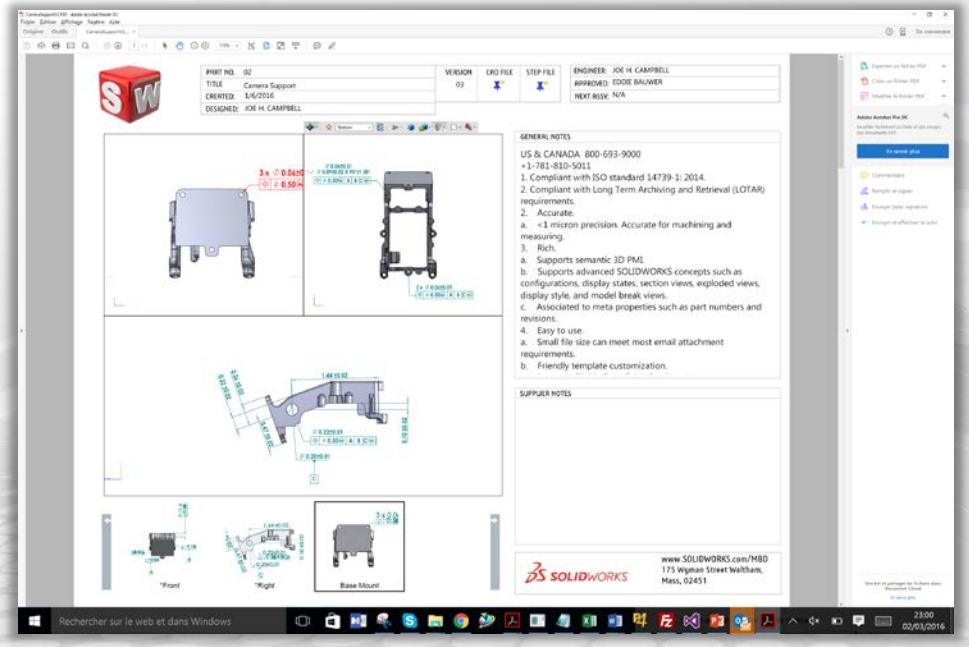
Source: Aberdeen Group study

Publish MBD to PDF with 3D (Phase 4)

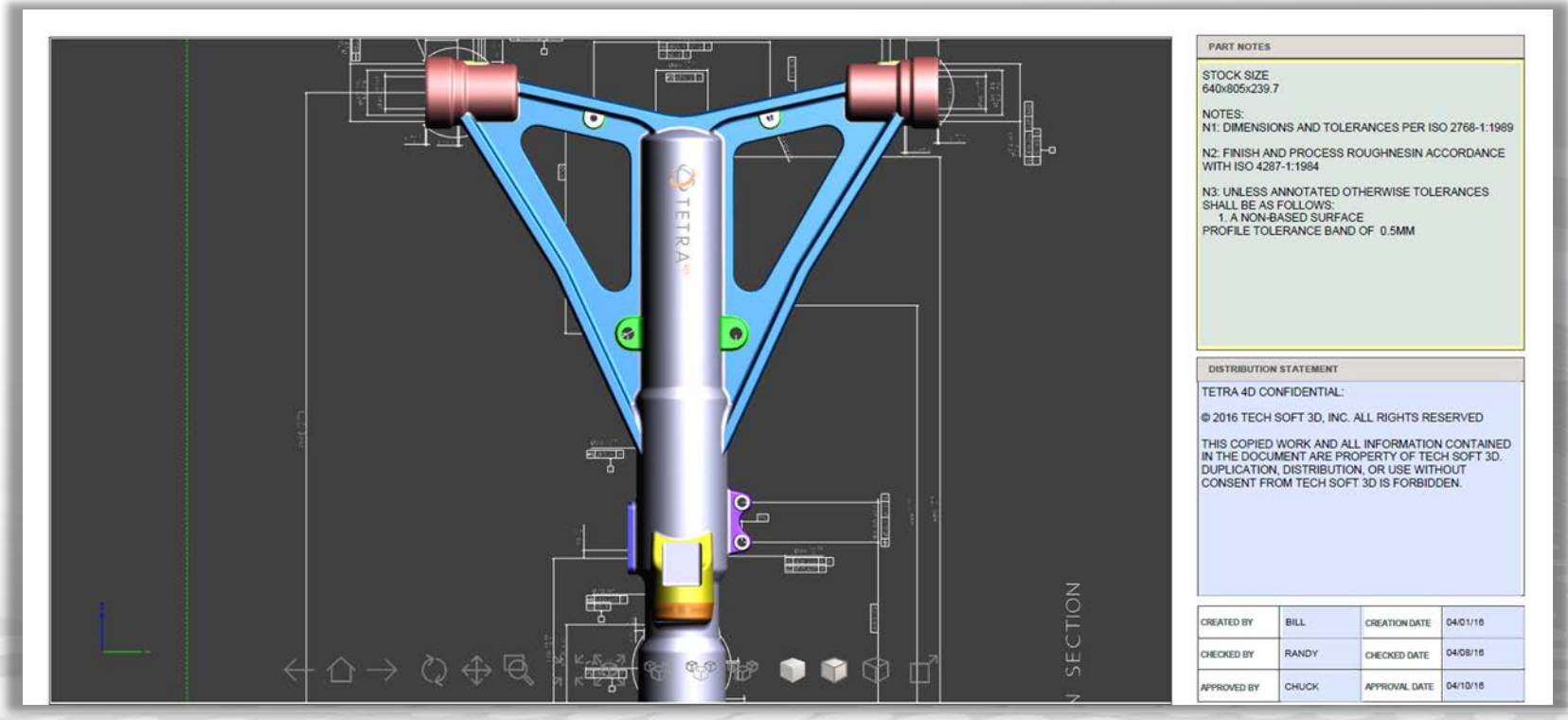


Fully leverage the capabilities of the PDF platform

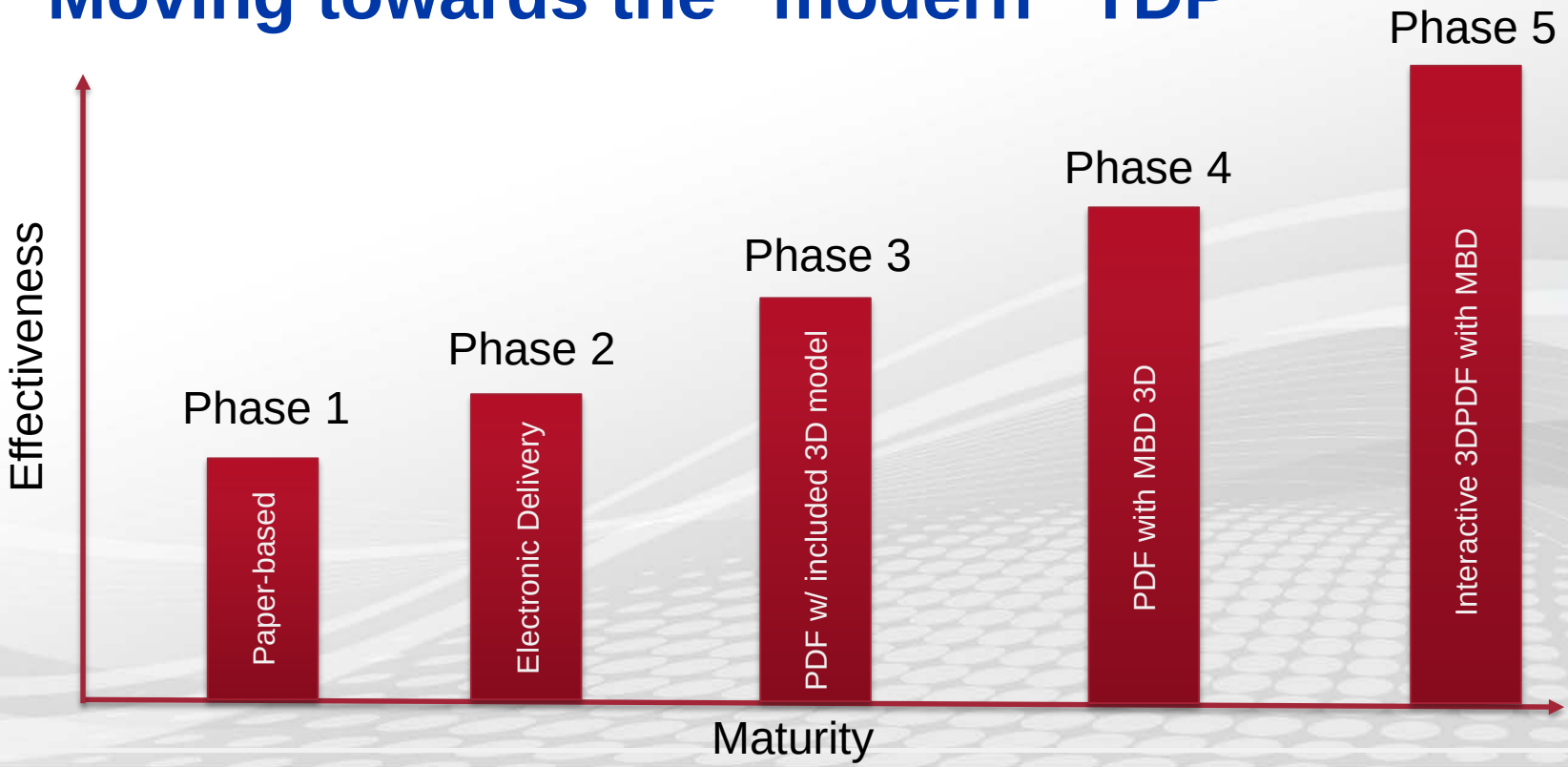
- **Templates ensure consistent presentation**
- **Portfolios enable “collections” of information**
- **Interactivity connects relevant, disparate data**
- **Relationships improve navigation**



Publish “interactive 3DPDF” with MBD (Phase 5)



Moving towards the “modern” TDP

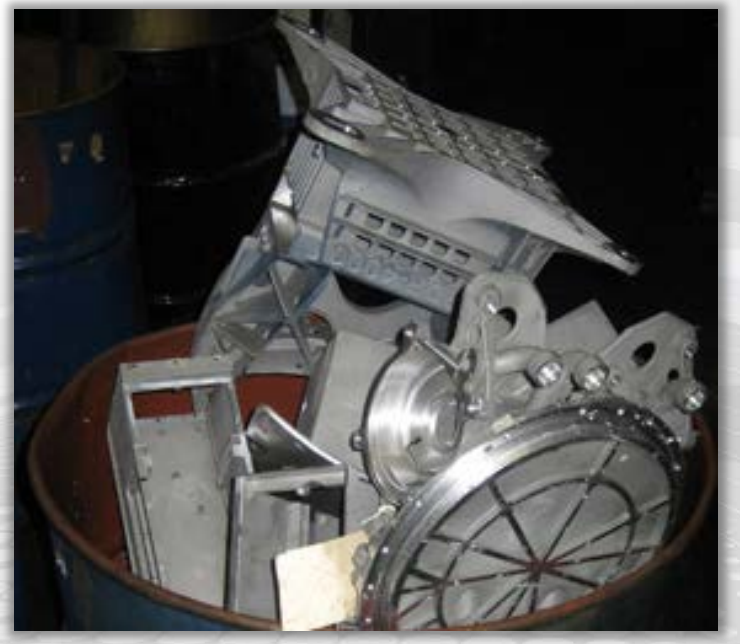


Ubiquitous Consumption

- Adobe Reader omnipresent
- Mobile consumption
- Web consumption
- Snaps into existing document management processes
- Archivable

Value of a modern TDP

- 27% reduction in procurement cost
- Reduction in quoting (accounts for 8% of cost)
- 19% of supplier scrap and rework due to poor TDP quality



Source: Defense Logistics Agency (DLA) survey

Benefits summary

- For customer
  - Reduced procurement costs
  - Lower overall lifecycle costs
  - Frictionless consumption
  - Shorter time to service
- For supplier
  - Reduced risk
  - Faster time to award
  - Increased profit margins
  - Competitive advantage

Resources

- 3DPDF Consortium – www.3dpdfconsortium.org
- Modeling Based Enterprise – www.modelbasedenterprise.org
- Tech Soft 3D – www.techsoft3d.com
- Tetra4D products – www.tetra4d.com
- Email: Jordan Opsahl – jordan@tetra4d.com
  Dave Opsahl – dave@techsoft3d.com


TETRA 4D