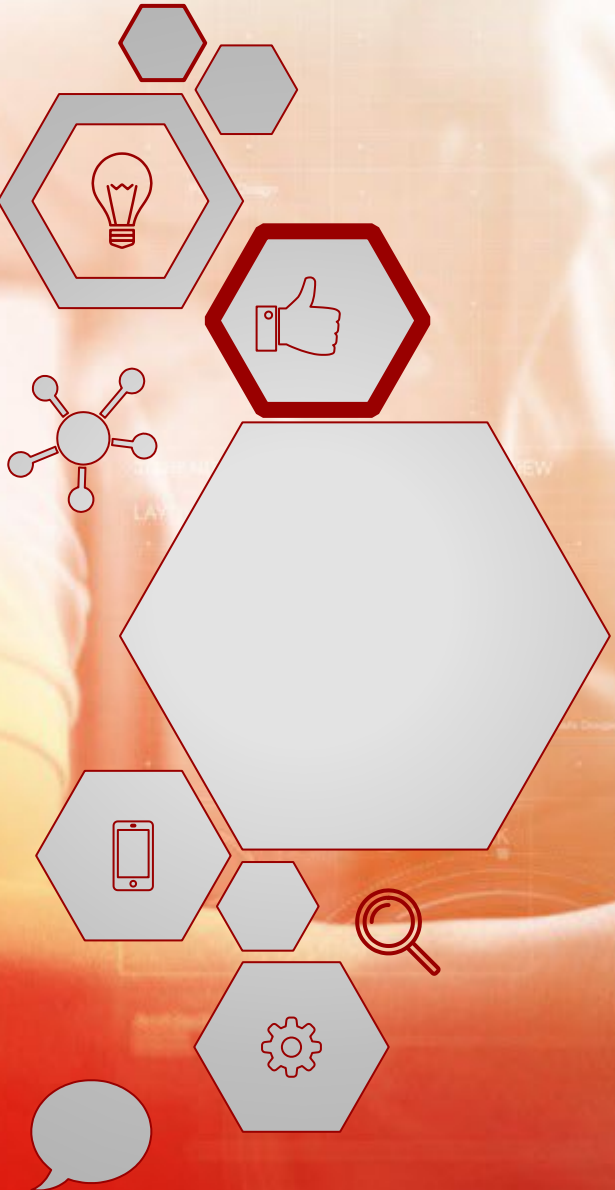




Stelae Technologies

Creating Actionable Information from Documents



MRO Case Study

- **MRO Operator in S.E Asia**
 - Multi Aircraft OEM
 - Multiple Airline Customers
- **Current Process**
 - Manual Copy/Paste of AMM/CMM data into MRO Planning Software
 - Copy/Paste from IPDs into Excel Sheets to create Product/Spares Ordering Sheets
 - Upload Excel Sheets to Supply Chain ERP
 - Copy/Paste from AMM/CMM to create Engineering Order in Word compliant with Local Regulator

Aircraft stays on ground for 4 days before any MRO work can start

MRO Data Sets

- **Smaller Volumes**
- **Highly Diverse**
- **Time Bound – clock starts when an Aircraft arrives at the MRO**

Heterogeneous Document Types require to be processed to create Engineering Orders, Input to Supply Chains

Aircraft/ Helicopters/Ships/Rail/ Submarines/Automotive/Engines/Spares/Avionics

1. Aircraft Manuals
2. Safety procedures
3. Emergency Procedures
4. Regulatory Documents
5. Minimum Equipment Lists
6. Illustrated Part Catalogues
7. Aircraft Maintenance Manual
8. Component Maintenance Manual
9. Service Bulletins
10. Airworthiness Directives
11. Repair Manuals
12. Job Cards
13. Tally Sheets
14. Maintenance Planning Document
15. Panel Lists

iSPEC2200, ATA 100,



PDF,SGML,Docx,xls,
csv

Maintenance Program

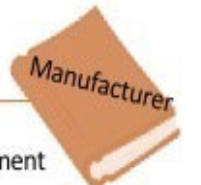
Routine Maintenance (MR)
(Schedule Maintenance)

- PRE-FLIGHT
- TRANSIT CHECK
- DAILY CHECK
- A CHECK
- C CHECK
- S CHECK
- D CHECK
- R CARD

MR
Maintenance Requirement
Maintenance Program for Airline
Providing schedule guideline for
each parts of aircraft



MPD
Maintenance Planning Document
From Manufacturer
The main resource for MR



Task Card & Tally Sheet

JOB CARD		MPD-TASK:
MSR -		AMM TASK:
A/C Reg.:	TITLE:	
CARD:	ZONE:	INTERVAL:
SKILL:	ACCESS:	

**** ON A/C ALL**

TASK
Functional Test to do a Check of the Distribution Piping for leakage and Obstruction

1. **Reason for the Job**
Refer to the MPD TASK:
FUNCTIONAL CHECK OF DISTRIBUTION PIPING FOR LEAKAGE AND OBSTRUCTION.
- to make sure that the extinguishing line is operational.

2. **Job Set-up Information**

A. **Fixtures, Tools, Test and Support Equipment**

REFERENCE	QTY	DESIGNATION
No specific	AR	ACCESS PLATFORM 3M (10 FT)- ADJUSTABLE
No specific	AR	AIR SOURCE 2 BAR (30 PSI) - REGULATED, FILTERED, DRY
No specific	AR	SAFETY CLIP - CIRCUIT BREAKER
No specific	AR	WARNING NOTICE(S)
(1234)	1	TEST TOOL-ENG. FIRE EXTINGUISHINK SYST.(RB211 TRENT)

B. **Work Zones and Access Panels**

ZONE/ACCESS	ZONE DESCRIPTION
B11	
FOR 403QEM1 (POWERPLANT-DEMOUNTABLE, ENG 1)	
41SAL, 41SAR, 41YAL	
41BAR, 453CL, 453CR	
FOR 403QEM2 (POWERPLANT-DEMOUNTABLE, ENG 2)	
42SAL, 42SAR, 42YAL	

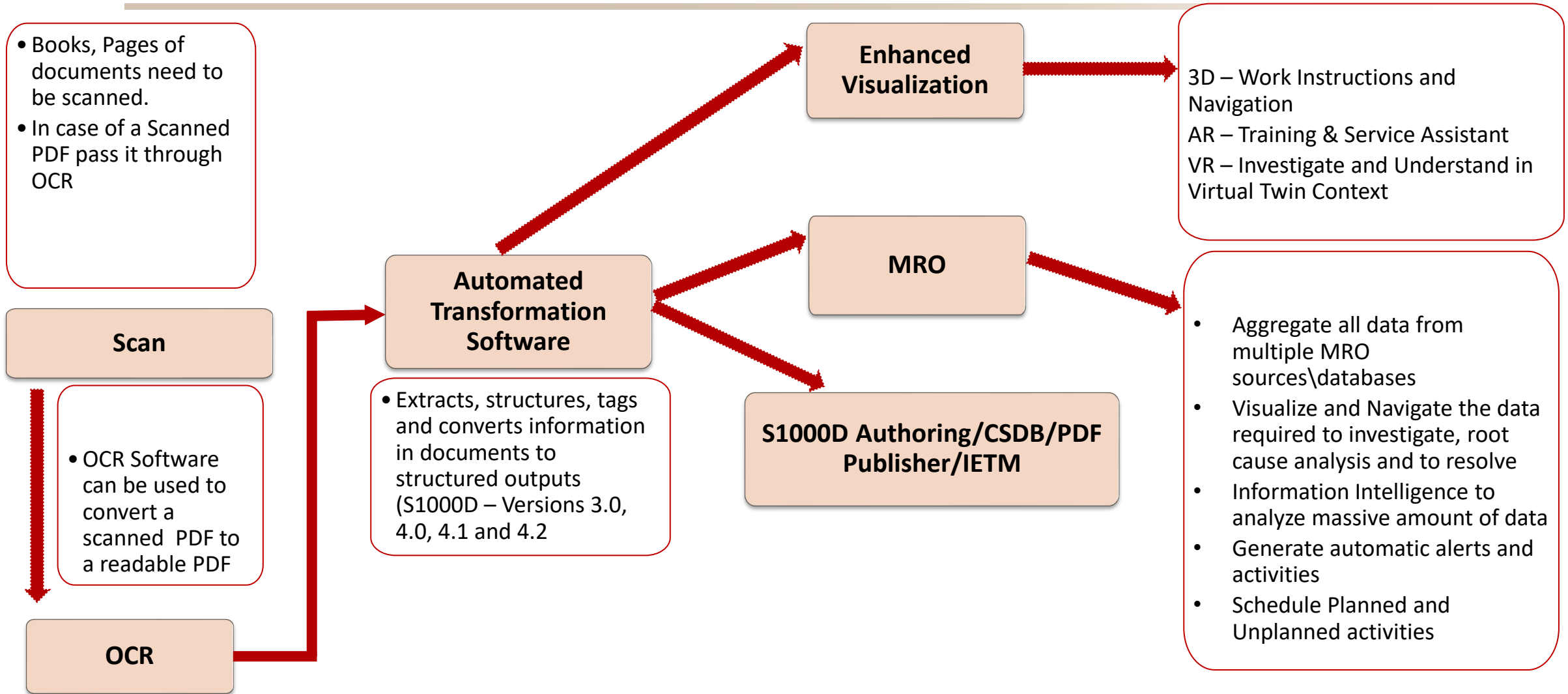
C. **Referenced Information**

REFERENCE	DESIGNATION
(Ref. 24-42-00-861-801-A)	Energize the Ground Service Network
(Ref. 26-21-41-400-804-A)	Installation of the Engine Fire-Extinguisher Bottle
(Ref. 71-13-00-010-805-A)	Open the Fan Cowl Doors
(Ref. 71-13-00-410-805-A)	Close the Fan Cowl Doors
(Ref. 72-22-41-000-801-A)	Removal of the Gas Generator Fairings
(Ref. 72-22-41-400-801-A)	Installation of the Gas Generator Fairings

Page 1 of 1

6Y CHK										13:33	13.Sep.2019	
Workpackage										Page 1/30		
A/C-Type: 333, Based on last Flight Log entry from Friday 13 September 2019 ; TAH: 19643:02 ; TAC: 6798 Description: 6Y-CHK										WP2451		
No	Log #	ATA	Description	Est. ME	TO GO	PRIO	Material	Requested Work performed and transferred again for next step	Requested Work performed and closed	Other	No work performed	
1	5952915	05	PERFORM MID-CHECK PERFORM CHECK: 6Y-CHECK, 6 YEARS STRUCTURE		940	U	Y					
2	5033148		PERFORM CHECK: C04, C-CHECK INTERVAL: 5400/H		940	U	Y					
3	14367261	20-00	PERFORM CHECK: 18M02, 18 MONTHS CHECK INTERVAL: 18/MT		1580	U	Y					
4	BTC	20-00	531101-01-1 (00) / FRONT PRESSURE B/HEAD FWD FACE INSP		930	U	I	Not issued				
5	BTC	20-00	531102-01-1 (00) / COCKPIT SIDE WINDOWS EXTERNAL INSP		930	U	I	Not issued				
6	BTC	20-00	531105-01-1 (00) / COCKPIT WINDSHIELD EXTERNAL INSP		930	U	I	Not issued				
7	BTC	20-00	531123-01-1 (00) / STRUCTURE BELOW GALLEYS/TOILETS INSP		930	U	I	Not issued				
8	BTC	20-00	531173-01-1 (00) / FUSE INTERNAL STRUC BELOW DOOR1 INSP		930	U	I	Not issued				
9	BTC	20-00	531176-01-1 (00) / STRUC BELOW BATT (FR10A/FR11A) INSP		930	U	I	Not issued				
10	BTC	20-00	532102-01-1 (00) / FUSE STRUCTURE (FR20/FR39.1) INSP		930	U	I	Not issued				
11	BTC	20-00	532104-01-1 (00) / STRUC BELOW GALLEYS & TOILETS INSP		930	U	I	Not issued				
12	BTC	20-00	532105-01-1 (00) / STRUCTURE BELOW FWD CARGO DOOR INSP		930	U	I	Not issued				
13	BTC	20-00	532122-01-1 (00) / STRUC BELOW DOOR 2 (FR32/FR36) INSP		930	U	I	Not issued				
14	BTC	20-00	533006-01-2 (00) / FRAMES 53.2,53.4,53.6&53.8 WEB INSP		930	U	I	Not issued				
15	BTC	20-00	533035-01-2 (00) / SKIN & BELLY STRC (FR37.1/FR47) INSP		930	U	I	Not issued				
16	BTC	20-00	533036-01-2 (00) / SKIN & BELLY STRUC (FR47/FR56) INSP		930	U	I	Not issued				
17	BTC	20-00	533122-01-1 (00) / KEEL BEAM STRUC (FR47/FR53.2) INSP		930	U	I	Not issued				
18	BTC	20-00	533123-01-1 (00) / MLG BAY (FR47/FR53.2) INSPECTION		930	U	I	Not issued				
19	BTC	20-00	533143-01-1 (00) / FR53.2&PRESS BULKHEAD AFT FACE INSP		930	U	I	Not issued				
20	BTC	20-00	533144-01-1 (00) / CENTER WING BOX (FR39.1/FR40) INSP		930	U	I	Not issued				
21	BTC	20-00	533191-01-1 (00) / DOOR 3 CUT-OUT (FR53.4/53.8) INSP		930	U	I	Not issued				
22	BTC	20-00	534127-01-1 (00) / FUSE STRUC (FR73.2/FR73) INSPECTION		930	U	I	Not issued				
23	BTC	20-00	534128-01-1 (00) / FUSE STRUC (FR73/FR80) INSPECTION		930	U	I	Not issued				
24	BTC	20-00	534134-01-1 (00) / DOOR 4 STRUCTURE (FR73/FR76) INSP		930	U	I	Not issued				
25	BTC	20-00	534145-01-1 (00) / BULK CARGO DOOR CUT-OUT INSPECTION		930	U	I	Not issued				

Software Driven Automation – From Paper to IETM, Enhanced Visualization and Immersive Solutions & MRO



Reduction in Maintenance personnel globally due to Covid

● Key Trends in Aftermarket



OEMs expanding aftermarket through Servitization: Bundling of products, services, support & knowledge

- Investment & expansion of ecosystems like Skywise (Airbus) and Yocova marketplace (RR)
- Expansion of Aftermarket solutions like Pay-per-hour (PW), Goldcare (Boeing), etc.
 - Improved CX – Reliability 360, Automated Customer tech support, Spares forecasting



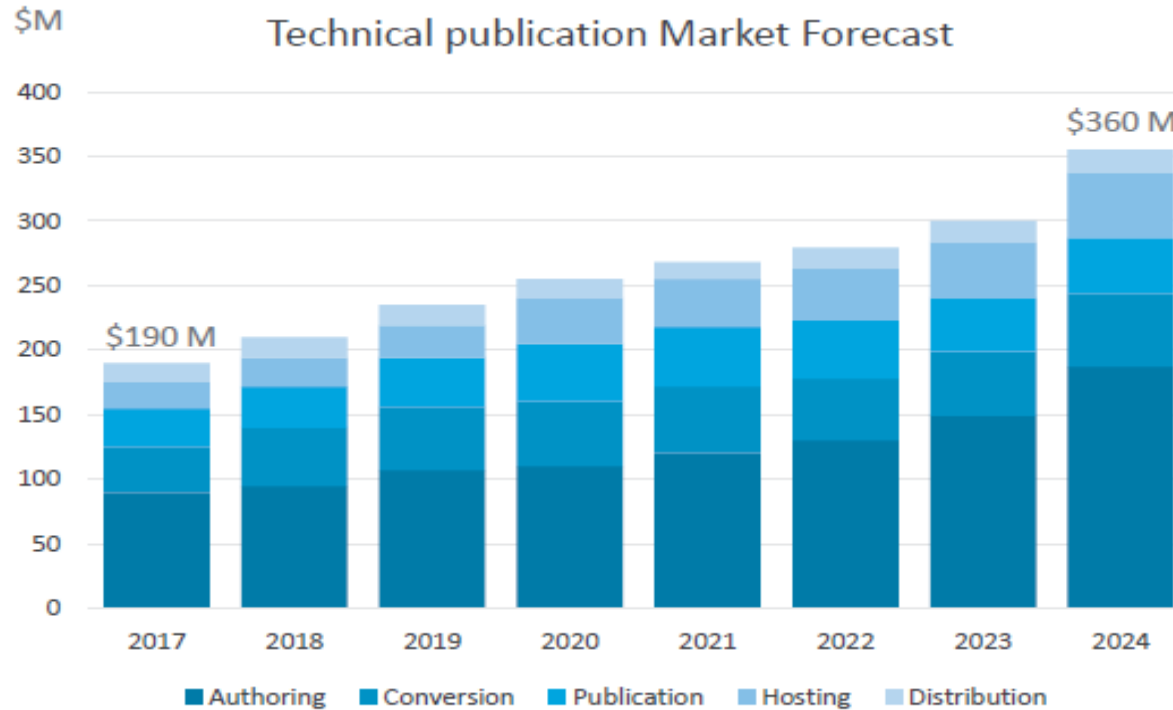
Digital Driven Streamlined Operations

- **Technical publications platforms** - Integrated, Centralized systems, standardize formats
- **Integrated Maintenance** - Asset health monitoring, In-service maintenance, like Engine wash, Leasing etc
- **Digital investments in MRO** - UAV for inspection, Blockchain for records management, Content Personalization etc.
- **Real-time asset information** - Customer360, Reliability 360, Engine / Program 360

Emerging Global Standards driving Digital Transformation of Technical Documents



- Aerospace Technical Publication is estimated to be a \$360 Million Market in 2024. Focus will be on standardization to S1000D, using single centralized team



Authoring/conversion forms 68.7% in 2024

Key Stakeholders & their contribution

Stakeholders	Contribution
OEMs	31%
Primes	22%
Tier 1 companies	15%
Tier 2, 3 companies	10%
Other (incl PMA)	6%
MRO	16%

Source : Cyient Market research & Consulting team.