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Automated 2D to 3D CAD Conversions – Myth or Reality?

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Presented at the SME WESTEC 2004 – New Frontiers in Manufacturing Technology Conference, Los Angeles, CA

March 24, 2004

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
24 MAR 2004	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Automated 2D to #D CAD Conversions-- Myth or Reality?	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
Dr. Raj Iyer	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
USA TACOM 6501 E 11 Mile Road Warren, MI 48397-5000	**13974**
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	TACOM TARDEC
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES

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14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**SAR**	**29**	

Outline

- Need to move to 3D
- Issues with legacy data
- Decision factors
- Methodology
- Conversion issues
- Demos
- Conclusions

Legacy data

- Paper and Mylar drawings
- Scanned raster images
- 2D CAD vector files
- 3D "dumb" solid models

Need to move to 3D

- Large holdings of legacy 2D drawings
- Redesign (or design new) parts based on older designs
- Manufacture spare parts using new machine tools– improved logistic support
- Archive designs for future use
- Visualize 3D models for non-engineering use
- Virtual prototyping – engineering analysis

Issues with legacy data

- Scanned images
  - Poor scanning resolution
  - Poor quality of hardcopy drawings
  - Multiple sheets because of scanner restrictions
  - Need to be vectorized first
- Vectorized drawings
  - Duplicate and overlapping edges
  - Disconnected and crisscrossing edges
  - Near zero length entities
  - Breakup of entities
  - Incorrect scale factor
  - Ambiguous dimensions

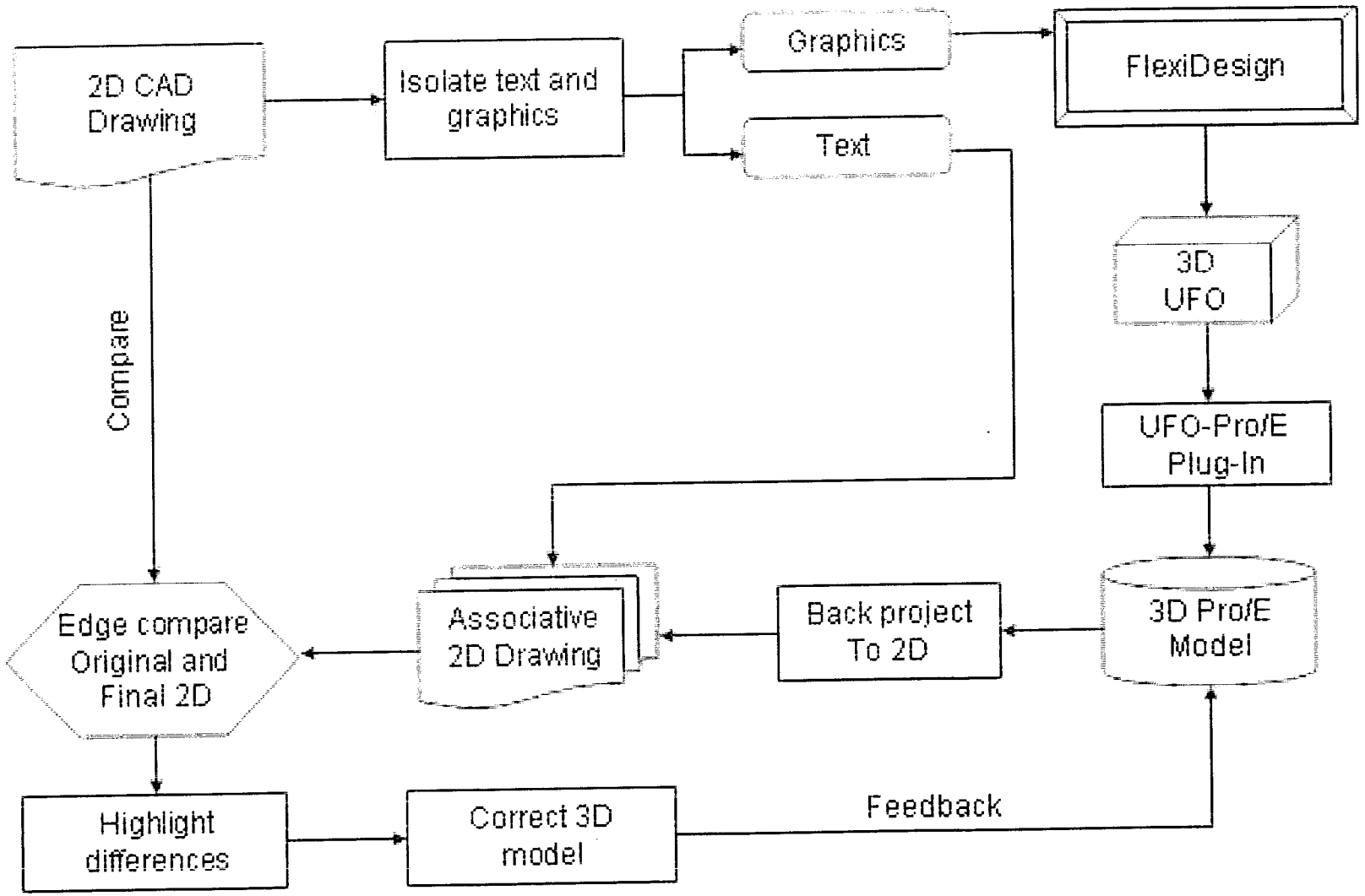
Conversion decision factors

- Future production quantities
- Remaining product lifecycle
- Potential for design changes
- Availability and quality of technical data package (TDP)
- Mechanical content
- System density

Available software solutions

- AutoBuildZ (PTC)
- SolidEdge (UGS)
- FlexiDesign (ASPire3D)

Conversion methodology



Conversion issues

- Works best with machinable piece parts
- Cannot handle assembly drawings
- Design intent
- Preprocessing and post-processing needed
- Automated vs. interactive
- Availability and completeness of data
- Pro/ENGINEER API issues
- Carryover of notes and non-geometric information

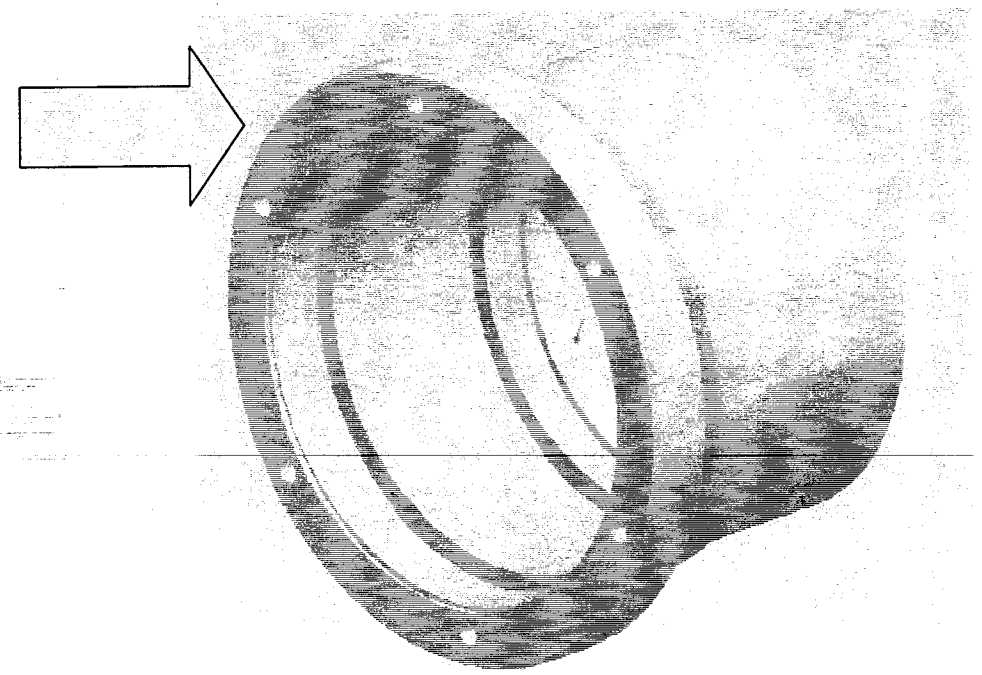
Process issues

- Can we mandate 3D across the enterprise?
- How to make 3D the official legal document for procurement?
- Do we need to hold on to the 2D?
- How do we manage raster, 2D and 3D concurrently?
- How do we interface with the PDM?
- Are our suppliers capable of handling 3D exclusively?
- Do we have rights to the contractor's design data?

Potential savings

- Automated conversions 4-5 times faster than manual conversions based on pilot conversions
- May not require engineers or 3D modeling experts
- In-house conversions on an as-needed basis possible
- Flexibility in outputs – Pro/E, Catia, UG, SolidWorks
- Lower costs in procuring and manufacturing parts by providing supplier with CAD data that they can directly use

Demos



In summary

- Cost-saving automated software are becoming available and affordable today
- Take advantage of cost/time savings that automated software provides
- Not a 100% solution – but definite productivity improvements over manual conversion approaches

Contact

- Any Questions?
- For more information:

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13974

Alfafara, Marsha 'CONTR'

From: Alfafara, Marsha 'CONTR'
Sent: Monday, January 26, 2004 10:53 AM
To: Iyer, Raj G.
Subject: OPSEC Review

Dr. Iyer:

The OPSEC Review on your briefing #13974"Automated 2D to 3D CAD Conversions -- Myth or Reality?" is complete. A PDF copy of the OPSEC Review Certification is attached.

To archive your briefing with the Defense Technical Information Center (DTIC), Fort Belvoir, I need for you to complete a Form 298 -- also attached. I will then submit your briefing to DTIC and contact you when they have assigned an archival number -- it a about a six week process.

If you have any questions please contact me -- my hours are listed below.

Marsha

Marsha Alfafara
Contracted Coordinator
TARDEC Technical Information Center (TIC)
AMSRD-TAR-O (MS 204)
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The TIC is located in Building 200C
Just South of the Media Center

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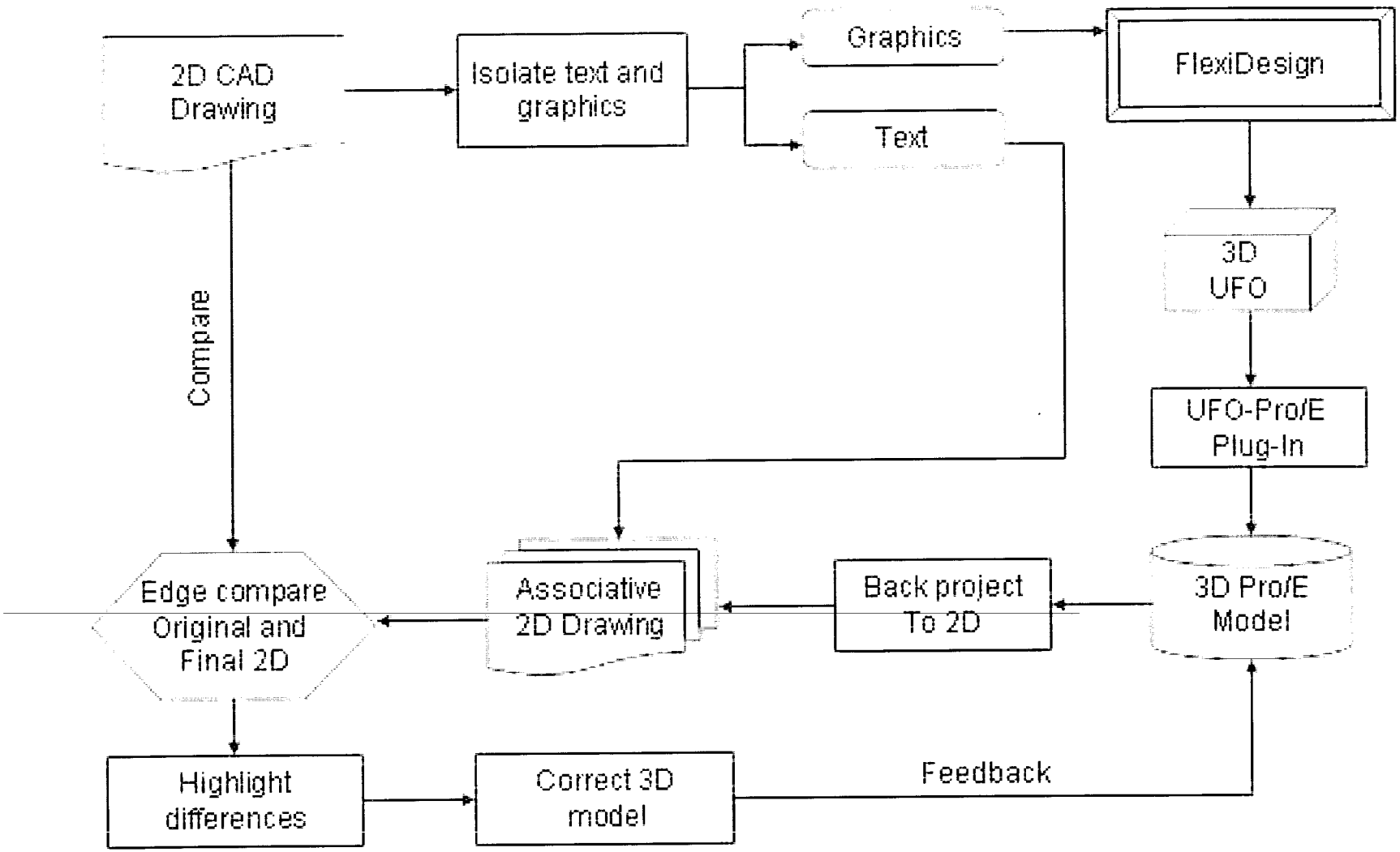

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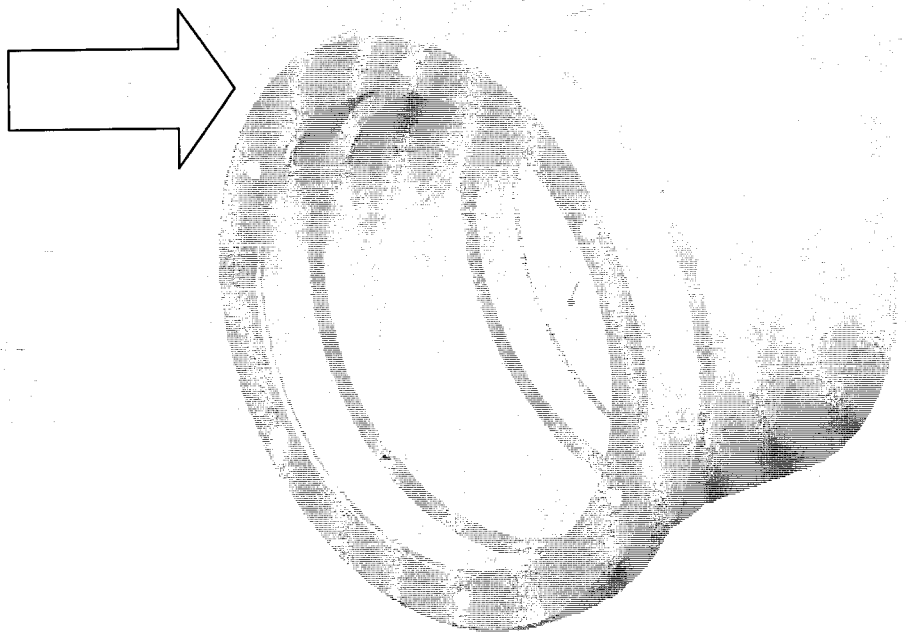

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