RICIS Symposium '88

November 9, 1988

Software Development Environments Status and Trends

Software Engineering Institute
Carnegie Mellon University
Pittsburgh, PA 15213

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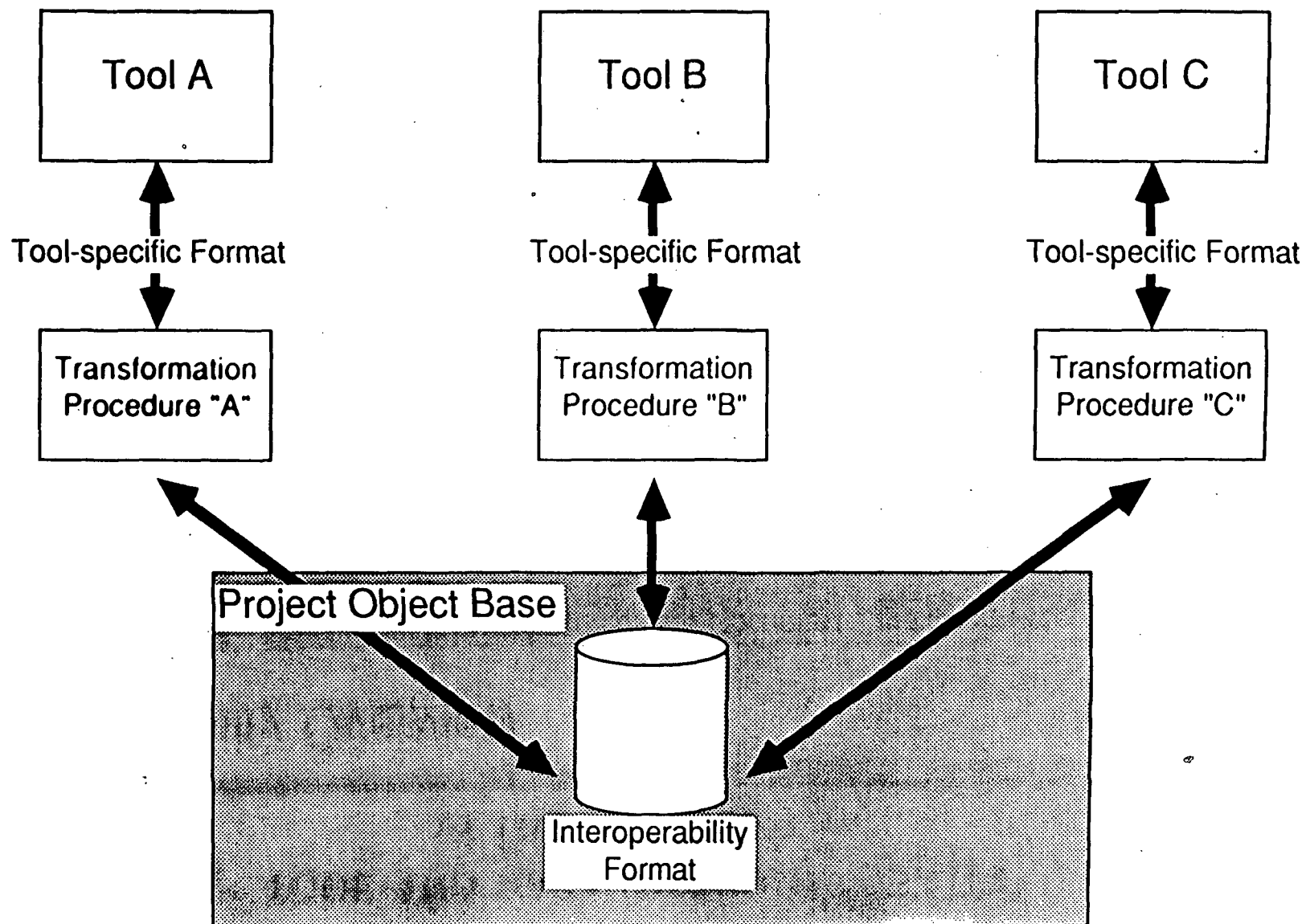**U.S. Department of Defense**

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Design Approach for Transformation Procedures

- Identify Common Subset of Tool Capabilities
  - Requires Detailed Understanding of the Tool
    Suite as well as Application Domain

- Develop Text-based, Machine-readable Representation
  - Text-based format avoids machine-dependencies
  - Compiler Technology can be Applied in most Cases

- Common Interoperability Format should be Hidden from
  Applications, unless it is their Native Format
  - Allows easy modification of Interoperability Format

- Transformation Procedures Require Similar support
  routines. Design for Portability and Reuse
  - Up to 75% of code in an Interoperability to Tool
    Transformation Procedure is common.
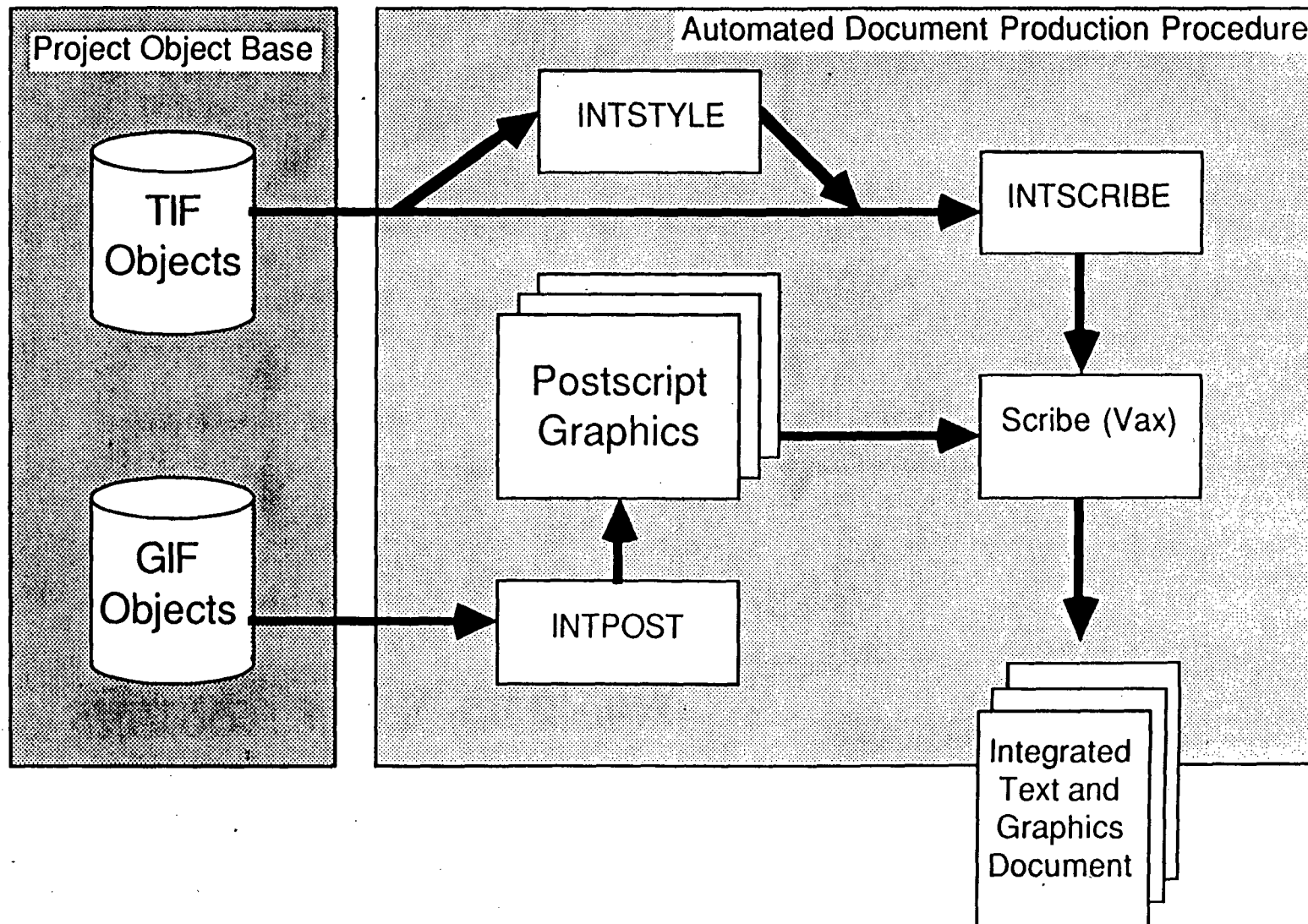
TOOL AND DATA INTEROPERABILITY
IN THE SSE SYSTEM

Interoperability Overview

Tool A	Tool B	Tool C

Tool-specific Format | Tool-specific Format | Tool-specific Format

Transformation Procedure "A"	Transformation Procedure "B"	Transformation Procedure "C"

Project Object Base

Interoperability Format

TOOL AND DATA INTEROPERABILITY IN THE SSE SYSTEM
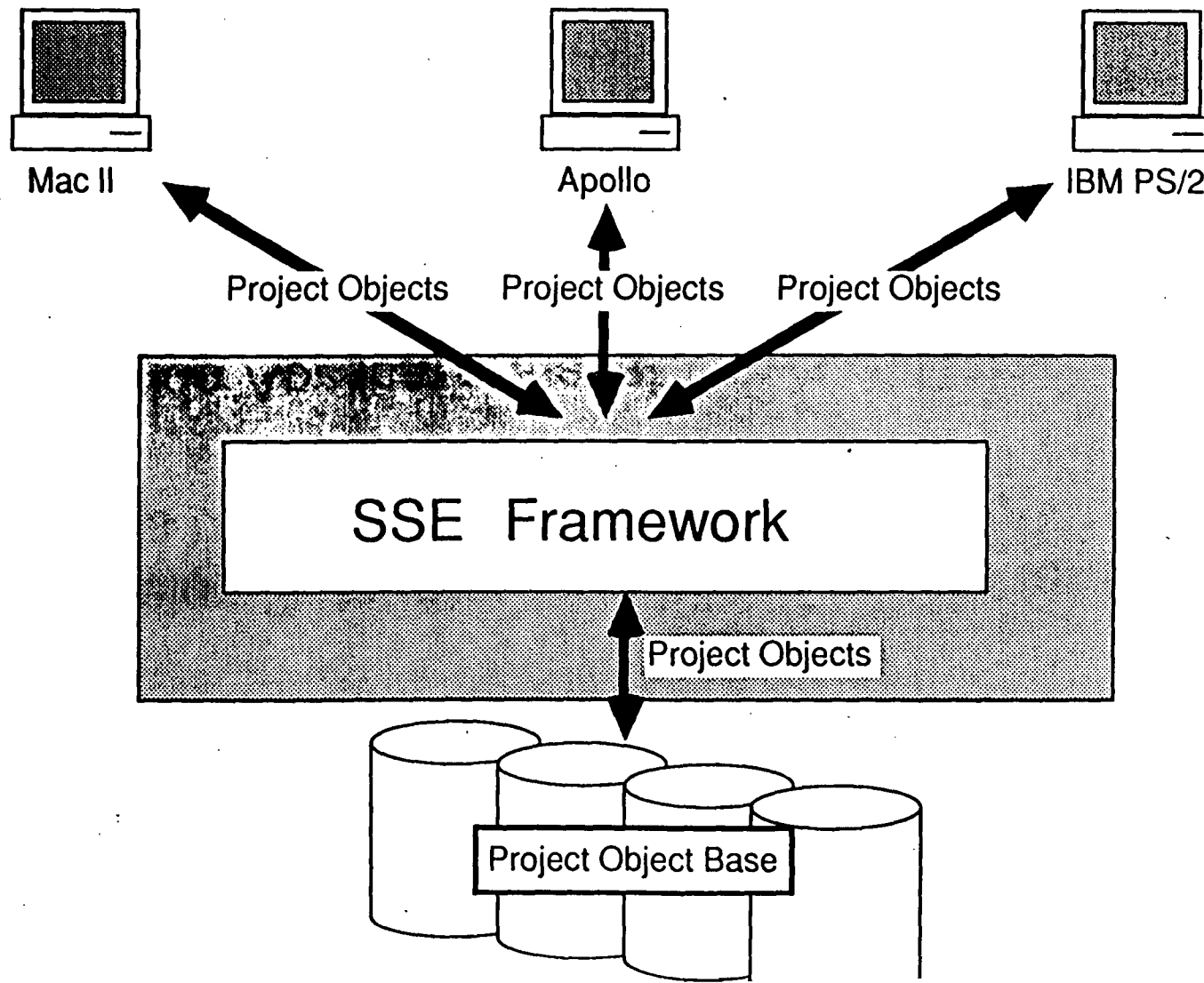
Interoperability Overview

SSE Interoperability Solution

- Develop Data Interoperability Formats for Each Class of Design and Development Tool

- Provide Application-level Views of Data, Versus Network, O/S or File System Views

- Tool/Data Interoperability Is Related to Information-bearing Entities, Not Physical Implementations or Interpretations

- Interoperability Formats Support the Intersection of Tool Capabilities, Not the Union

TOOL AND DATA INTEROPERABILITY
IN THE SSE SYSTEM

Interoperability Overview

SSE Interoperability Issues

- Multiple Hosts in a Distributed Environment

  - Vax/VMS

  - IBM/VM

- Multiple Workstations Networked to Hosts

  - Apollo

  - Macintosh II

  - IBM PS/2

SSE Interoperability Issues (cont'd)

- Design Tool Interoperability
  - Cadre Teamwork, Iconix PowerTools, Excellerator

- Graphics Development Tool Interoperability
  - Interleaf, MacDraw, GEM Draw

- Document Development Tool Interoperability
  - Interleaf, Microsoft Word (RTF and DCA Formats)

- Document Production
  - Scribe, Postscript

The Interoperability Problem

- Commonality of Data and Information

- Information Exchange between Diverse Tool Sets

- Interoperability between Heterogeneous Hosts

- Interoperability between Heterogeneous Tools

Past Attempts at Solving the Interoperability Problem

- Common Hardware Architecture
  - IBM 360, SDP, Various PC Standards

- Common or Standard Operating Systems
  - CP/M, MSDOS, Unix/POSIX

- Industry-developed Data Formats
  - DIFF, DCA, RTF
  - IGES, TIFF, GIF
  - EDIF

- Stand-alone Tool Integration
  - Mac O/S
  - Software Backplane