



Carnegie Mellon University  
Software Engineering Institute

Dr. Larry E. Duffel

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Software Development Environments  
Status and Trends

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## TOOL AND DATA INTEROPERABILITY IN THE SSE SYSTEM

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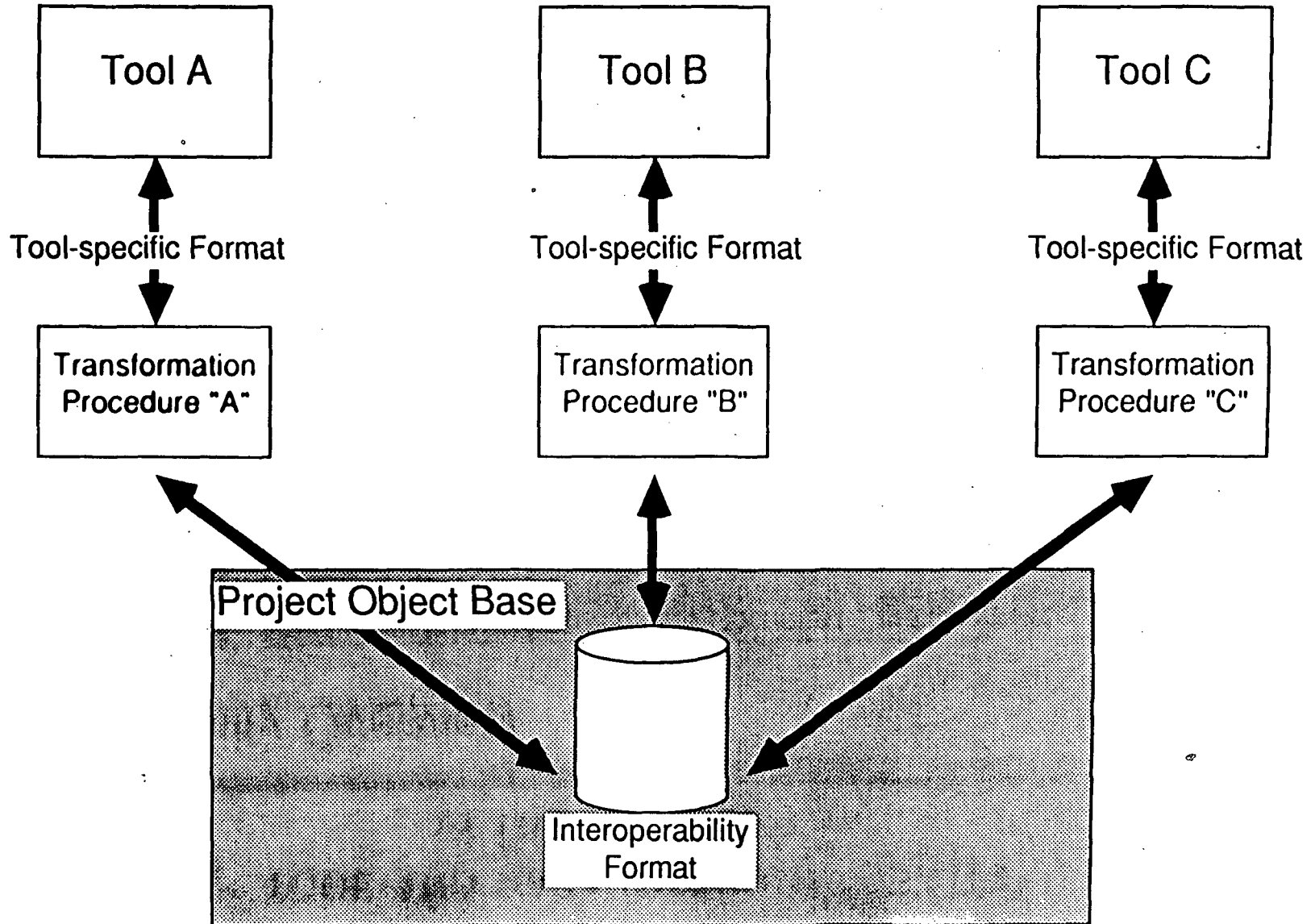
### Design Approach for Transformation Procedures

- 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.



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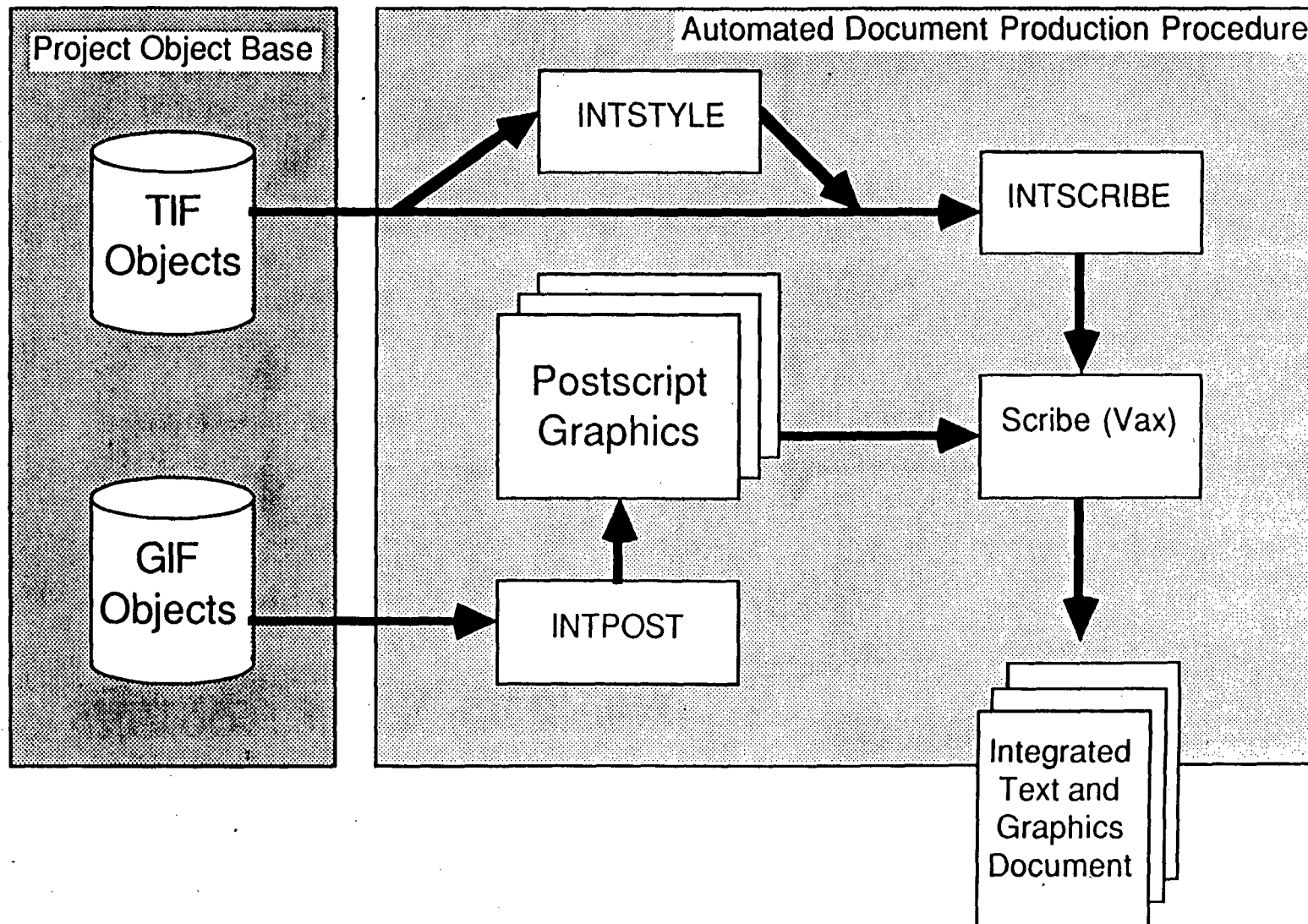
## Interoperability Overview





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## Interoperability Overview





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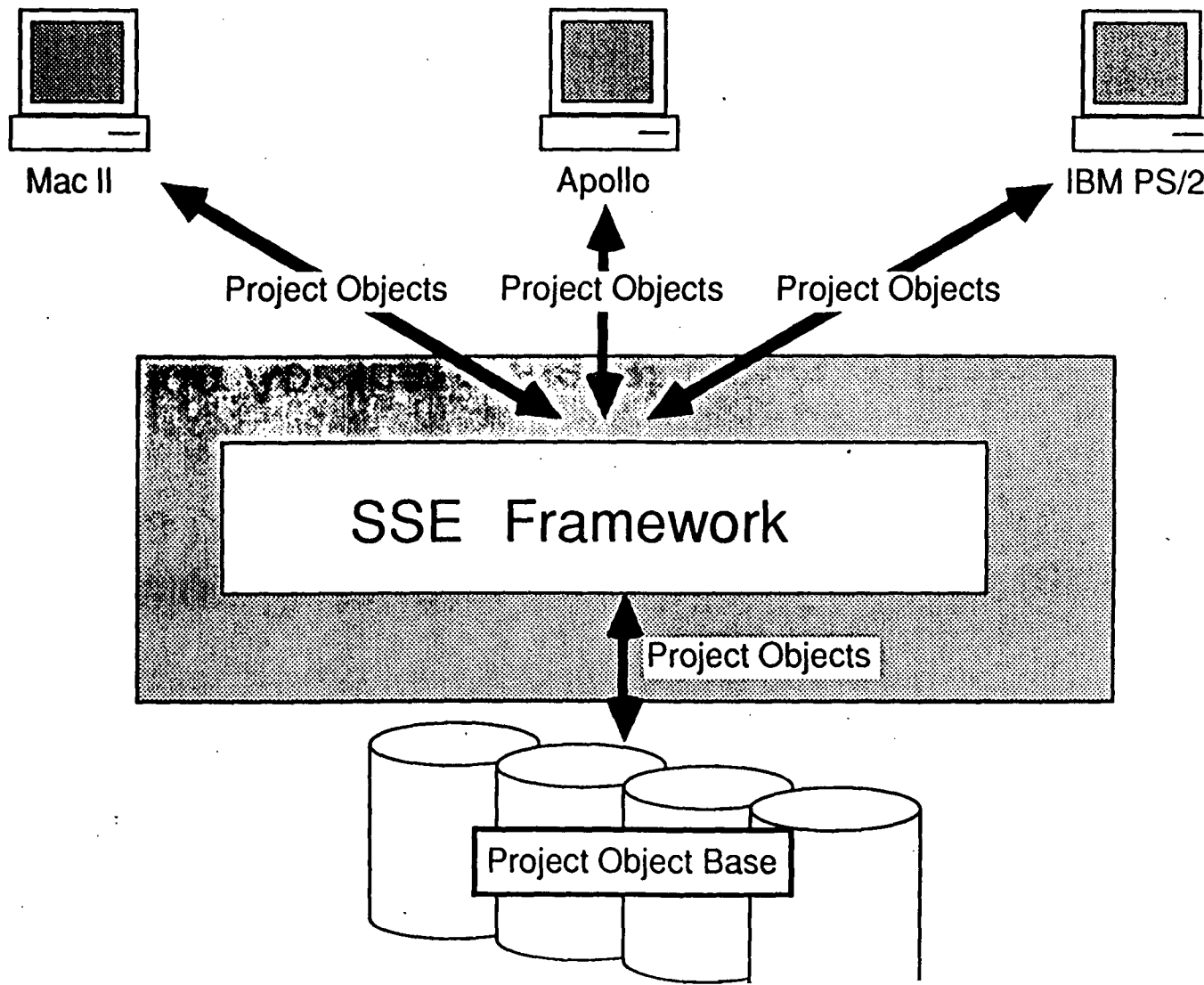
### SSE Interoperability Solution

- 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





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### SSE Interoperability Issues

- Multiple Hosts in a Distributed Environment
  - Vax/VMS
  - IBM/VM
- Multiple Workstations Networked to Hosts
  - Apollo
  - Macintosh II
  - IBM PS/2



## TOOL AND DATA INTEROPERABILITY IN THE SSE SYSTEM

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### 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





## TOOL AND DATA INTEROPERABILITY IN THE SSE SYSTEM

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### The Interoperability Problem

- Commonality of Data and Information
- Information Exchange between Diverse Tool Sets
- Interoperability between Heterogeneous Hosts
- Interoperability between Heterogeneous Tools



## TOOL AND DATA INTEROPERABILITY IN THE SSE SYSTEM

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### 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