



Apple[®] Development Tools and Object Technology

Apple[®] Computer's Development Tools

**Development
Systems**

Languages

MacApp[®]

Macintosh[®] Toolbox

Development Systems

- Macintosh[®] Programmer's Workshop: MPW[®]
- Macintosh Allegro Common Lisp[™]
- ViewEdit/Mouser
- HyperCard[™]

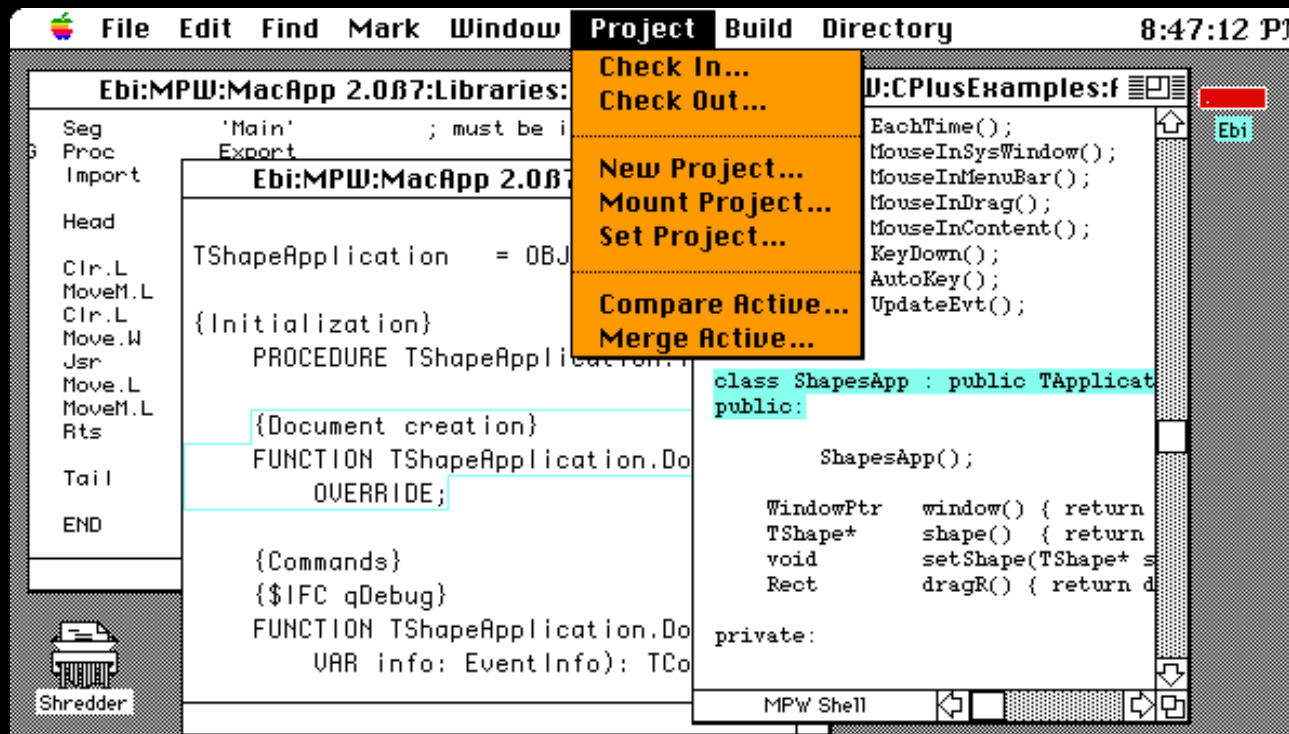
MPW[®]: Macintosh Programmer's Workshop

- Our Backbone Development System, in 3rd Major Release
 - Used internally and by over half of our developers
 - Features Editor, Command Shell, Pascal, C, Assembler, Linker, Projector, and other tools

MPW[®] SADE[®]: Symbolic Application Debugging Environment

- Source Level Debugger
- Scriptable
- Supported by all MPW languages
- Runs under MultiFinder[®] ; does not require debug code in application

Projector



Macintosh[®] Allegro Common Lisp[™]

- Prototyping
- Research
- AI
- Full Macintosh Interface Support
- Supports Common Lisp Object System (CLOS)

ViewEdit

- Interactively create Views - MacApp[®] user-visible objects
- Allows direct manipulation of objects
- Modify program without re-build

Mouser: MacApp[®] Browser

- Source Code Editor/Browser (à la Smalltalk)
- Edit/Browse MacApp and/or Application Source Code
- Supports Object Pascal or C++

Languages

- ANSI Compliant C
- Object Pascal
- C++

Plus 3rd-party FORTRAN, ADA, Modula,...

Object Pascal

- It's the standard
- Developed by Apple® with N. Wirth
- Largely adopted by Microsoft
- Pascal standards committee forming

MPW[®] C⁺⁺ FRONT: C⁺⁺ with Extensions

- SADI[®] support
- Object Pascal compatibility
- Automatic static initializer

C++ Debugging with SADE[®]

- No encryption of local variable names or data member names
- Token stream interface to MPW[®] C
- Built-in C preprocessor & scanner

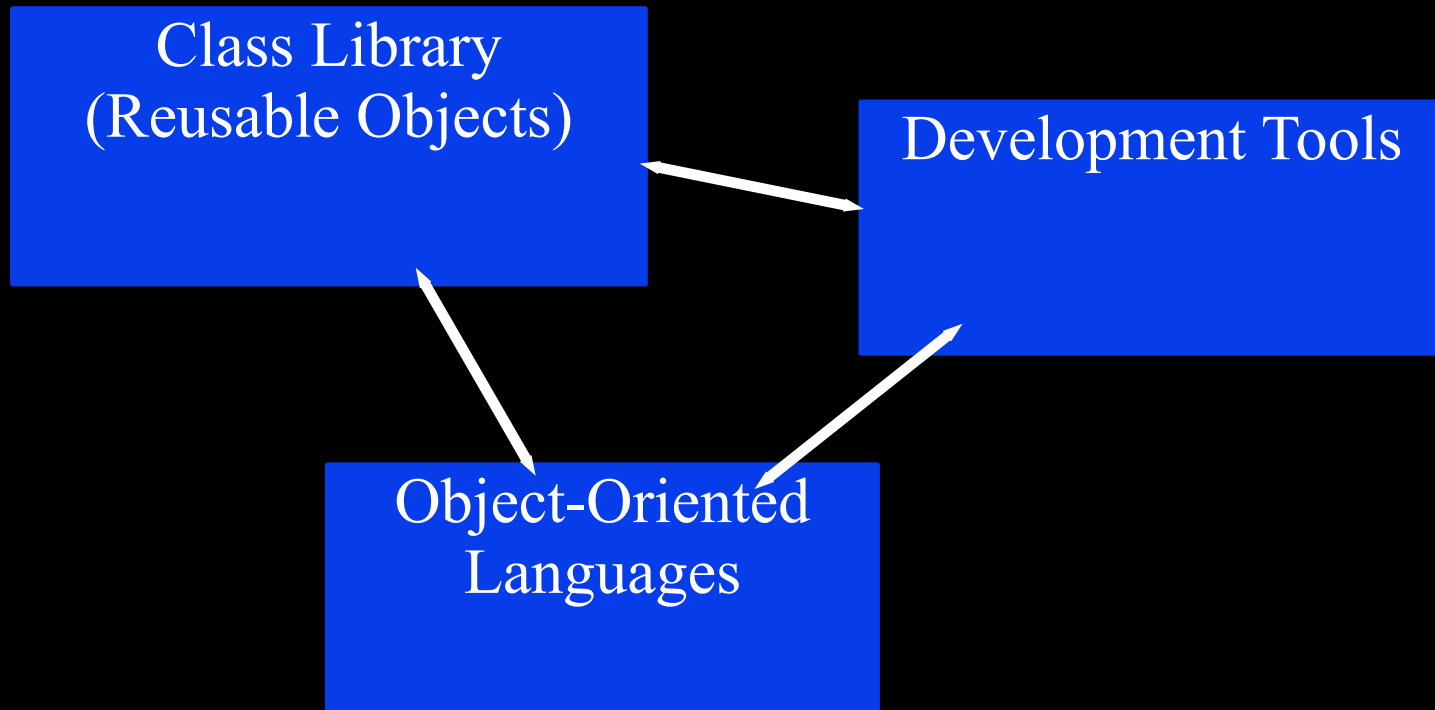
3rd-Party Object Languages

- Smalltalk V/Mac
- Smalltalk-80
- Prograph

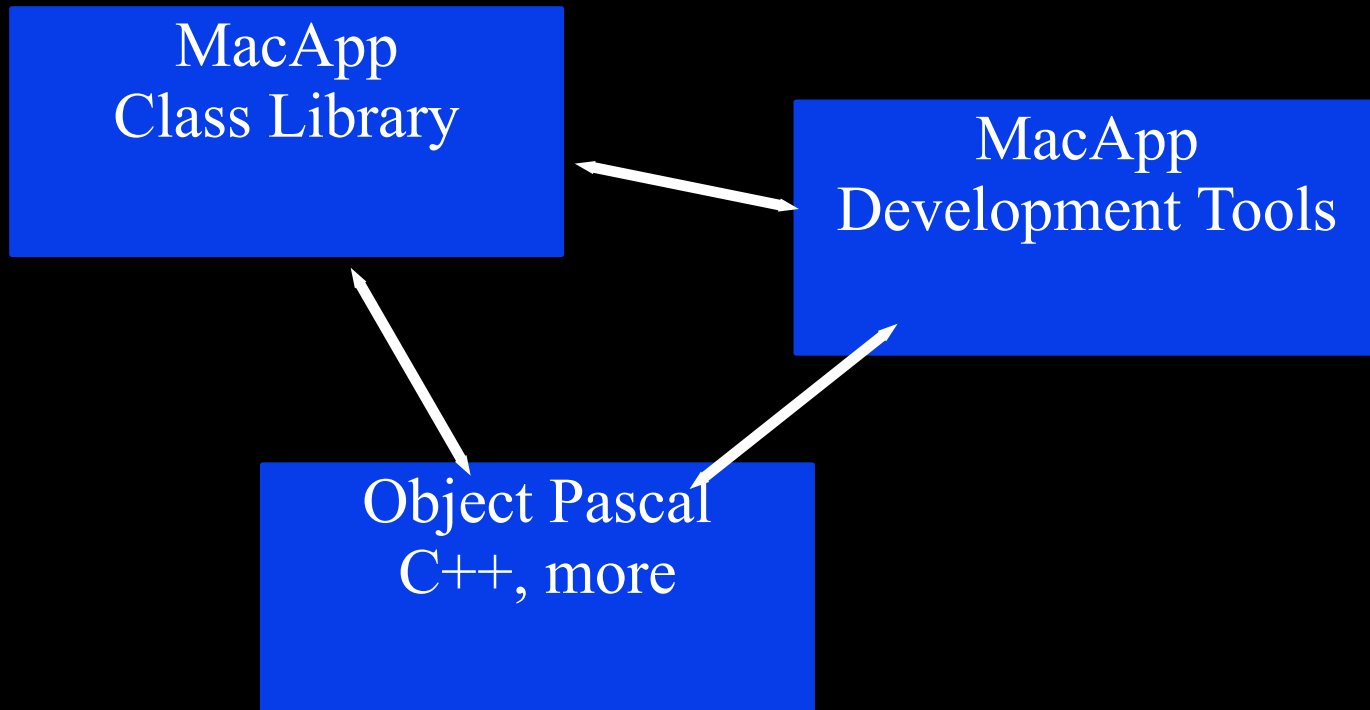
MacApp[®] and Apple[®] Computer's Object Technology

- MacApp
- Object Languages
- Object Tools

What is Object Technology?



What is MacApp[®] ?



Benefits of MacApp[®]

- Standard Macintosh[®] user interface already implemented and tested
 - Spend more time implementing application-specific features
- Simplicity
- Productivity
- Maintainability

Additional Benefits

- Follows compatibility guidelines
- Memory management, exception handling, and error reporting mechanisms
- Flexibility: Multilingual Support

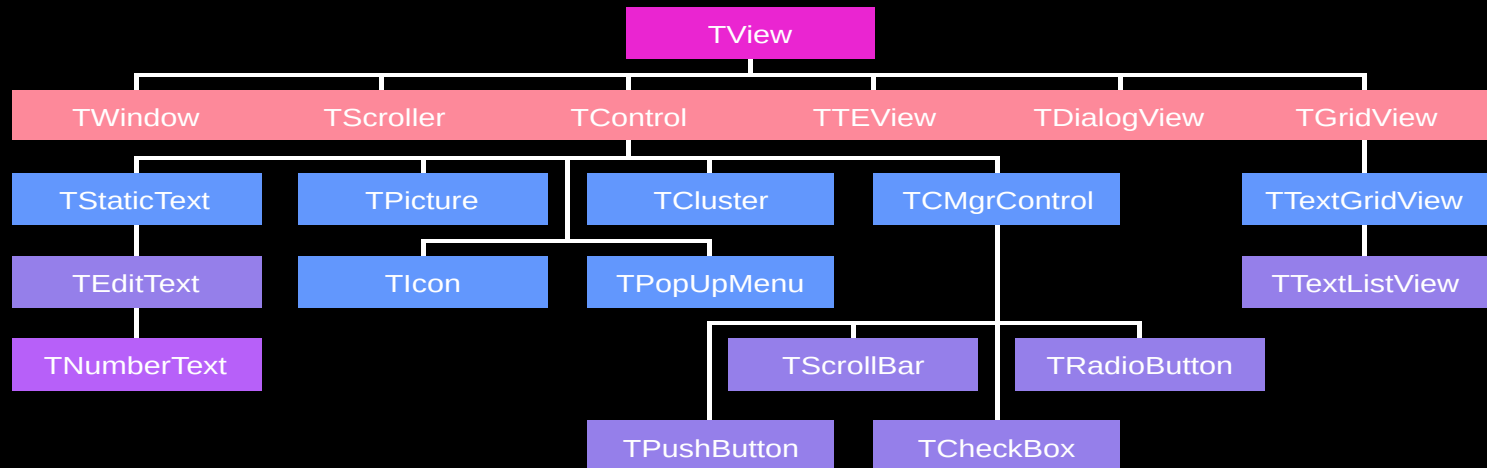
What MacApp[®] Implements (1)

- Main event loop
- Support for multiple documents
- Window management (move, resize, zoom,...)
- Menu management (including Undo framework)

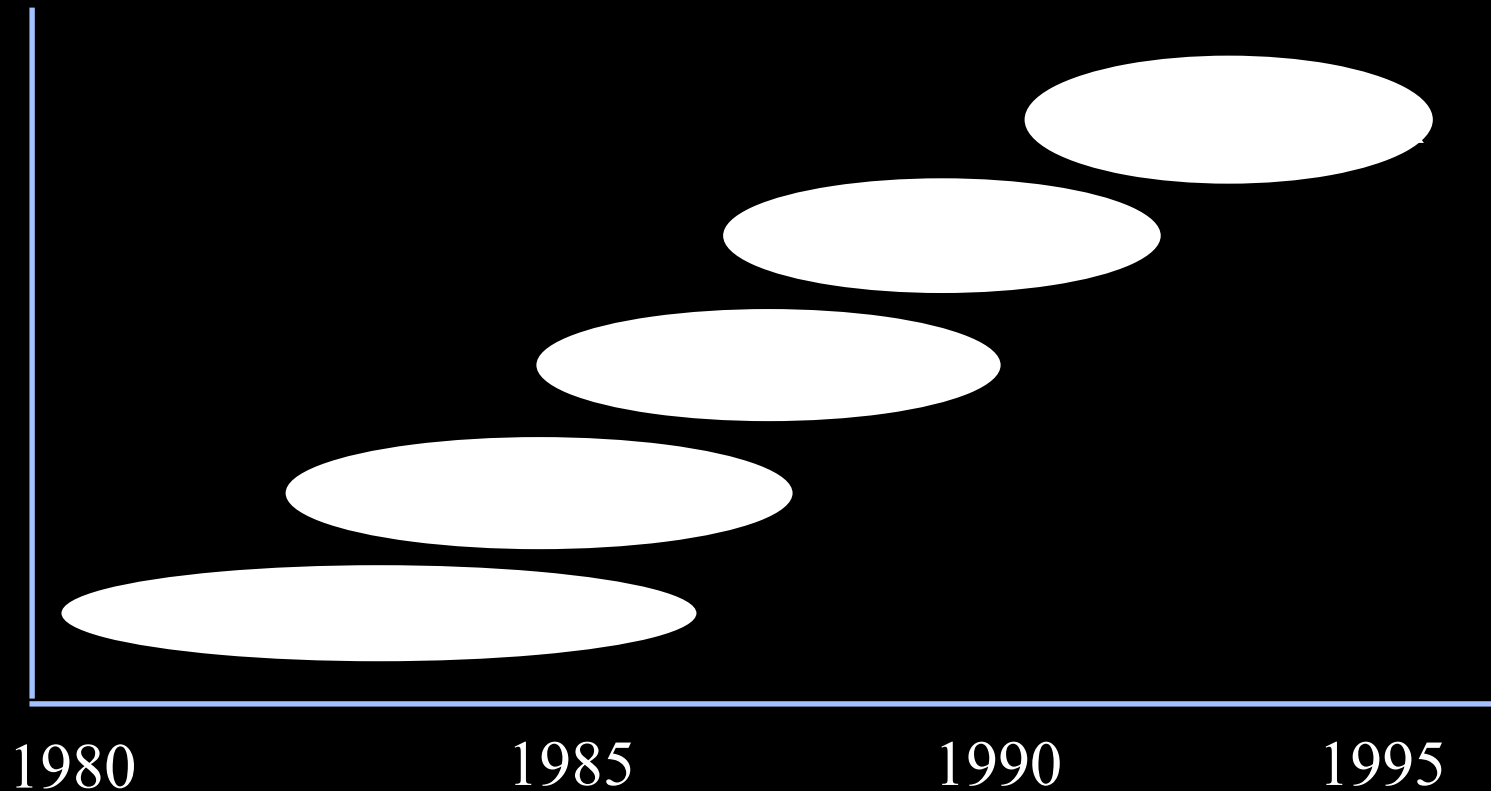
What MacApp[®] Implements (2)

- Exception handling and error reporting
- Memory and segment management
- Scrolling (manual and automatic)
- Clipboard support
- Printing

View Class Library (partial)



Apple[®] Computer's Decade+ of OOP



AppleScript™

- Common user scripting tool available system-wide:
create, edit, debug
 - The standard language for applications that need scripting
 - HyperTalk® based
 - Extensible to support control of application specific function

AppleEvents[™]

- Protocol for applications to communicate via IPC
- Multiple Apple-Event aware applications can work together, orchestrated via AppleScript
- Applications using MacApp will be Apple-Event aware “for free”

Putting it Together

- Direct Manipulation as in HyperCard[®] and ViewEdit
- Rich MacApp[®] Application Framework
- Ease of modification and interconnect of AppleScript[™]



The power to be your best™

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