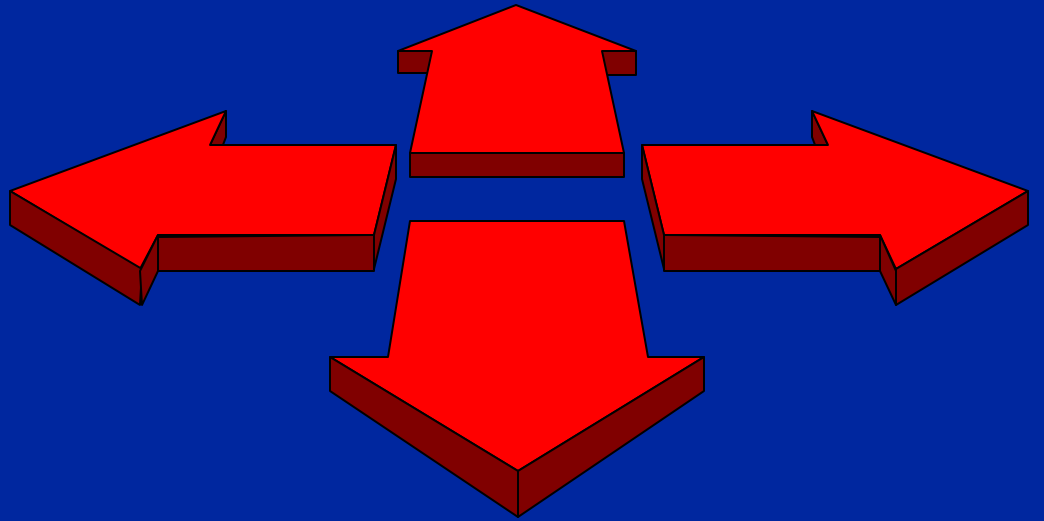


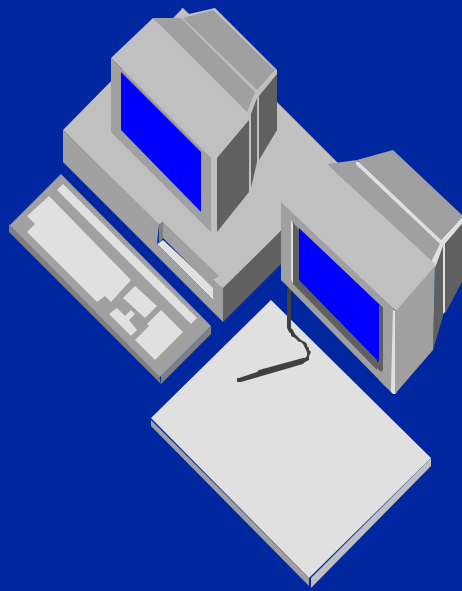
Windows[™] Open Service Architecture (WOSA)



Chris Williams
Product Manager, WOSA
Microsoft Corporation

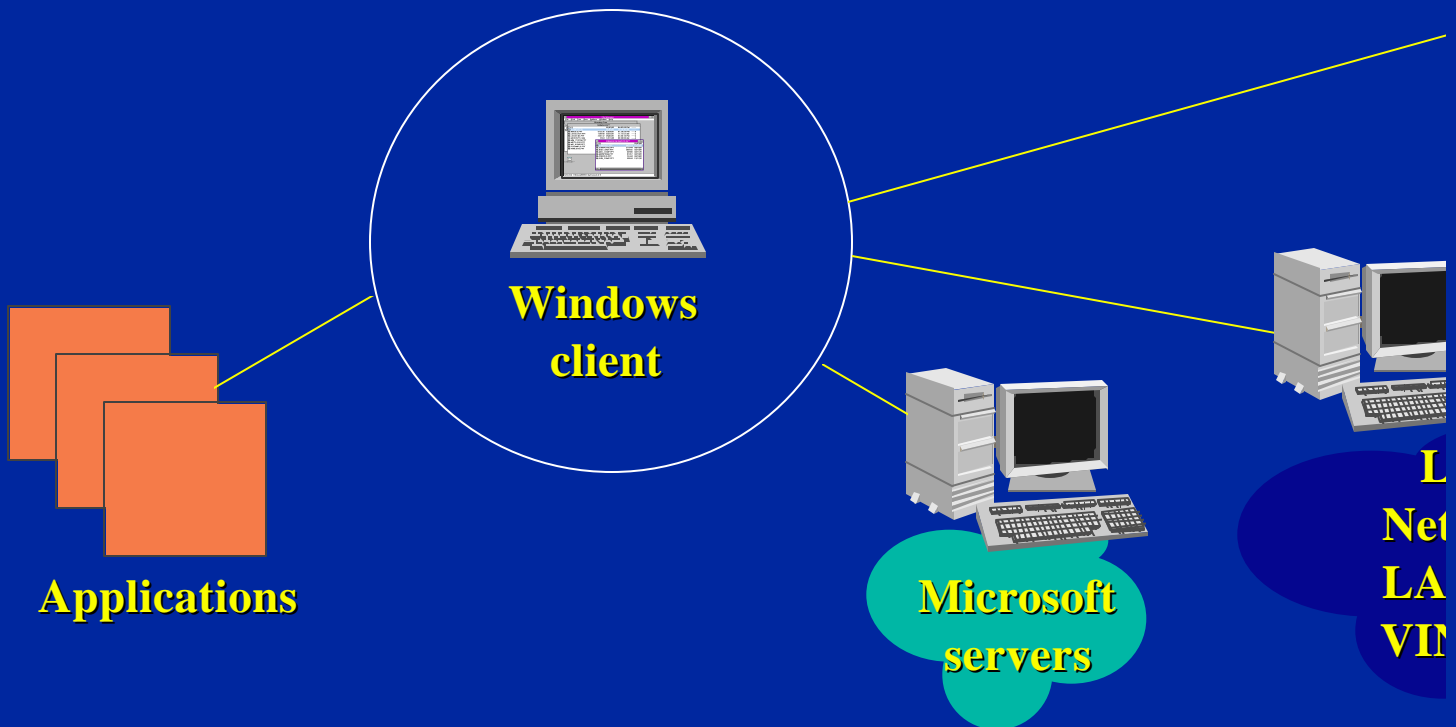
WOSA Description

- ◆ **Open architecture that enables Windows and Windows NT workstations to connect to a wide range of services in a heterogeneous environment**



Need For An Open Services Arch

- ◆ IS Managers want **choice, flexibility** and **security** in a heterogeneous environment
- ◆ Systems integrators need to integrate custom software packages
- ◆ Independant software vendors need a standard to connect applications with services



WOSA Services

◆ **Common application services**

- **Data Access: Open Database Connectivity (ODB**
- **Messaging: Messaging API (MAPI)**
- **Licensing: License Service API (LSAPI)**
- **Telephony: Telephony API (TAPI)**

◆ **Communication services**

- **Windows Sockets API**
- **Windows System Network Architecture (SNA) A**
- **Windows Remote Procedure Call (RPC) API**

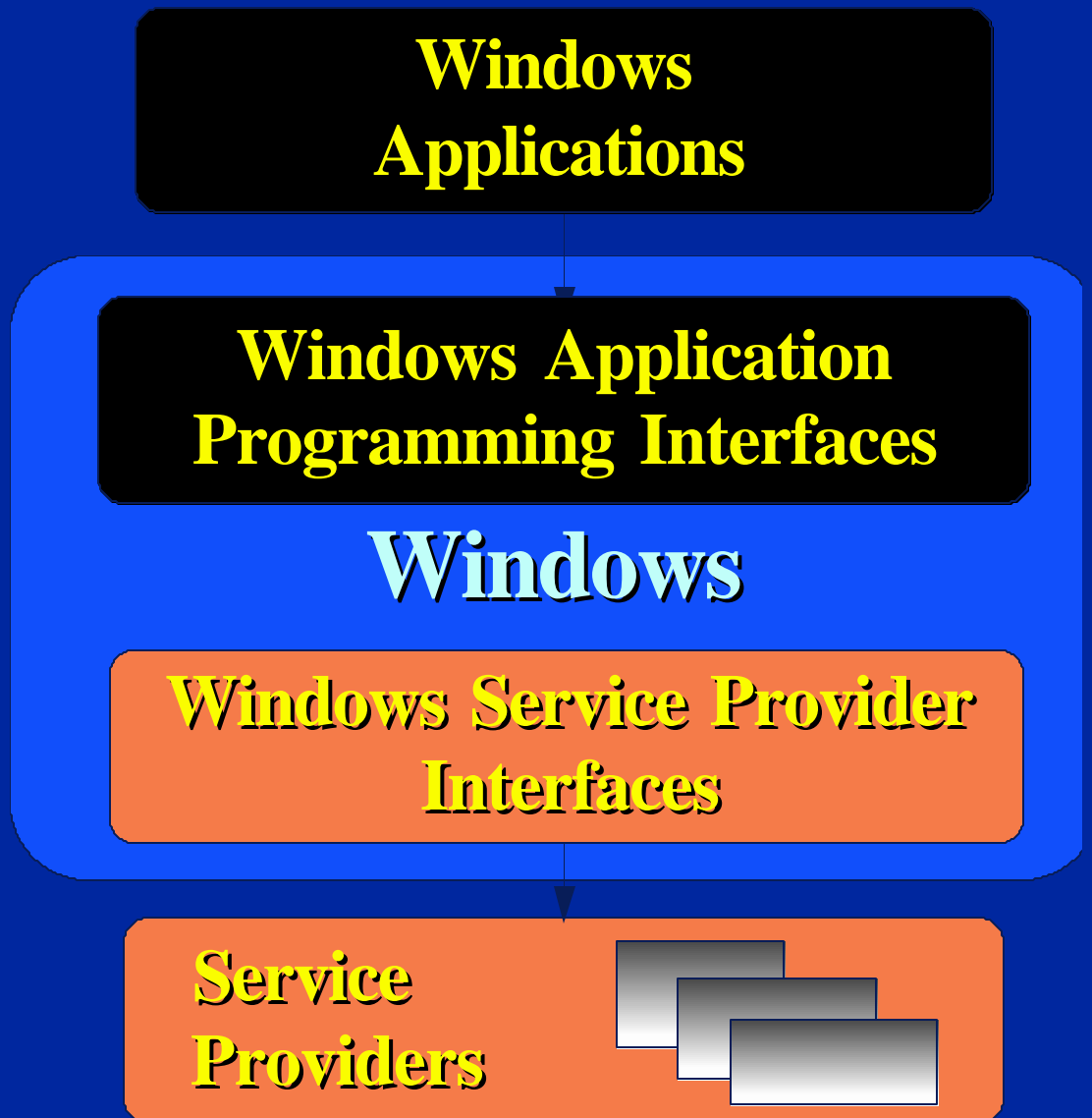
◆ **Vertical market services**

- **WOSA extensions for Financial Services**
- **WOSA extensions for Real-time Market Data**
- **WOSA extensions for Controls, Engineering and Manufacturing**

WOSA Objectives

- ◆ **Make application development easy with a consistent set of interfaces**
- ◆ **Provide an open interoperability architecture for everyone to work together**
- ◆ **Establish consensus with Microsoft Open Process**
- ◆ **Establish Windows as the best-connected client platform**

WOSA Architecture



WOSA Meets Today

Requirements

Requirement

Microsoft Re

◆ **Choice**

- Standardize programming interfaces
- Leverage investment toward future systems

- Standard API's
- Heterogeneous

◆ **Flexibility**

- Leverage power of the PC
- Insulate user and application from complexity of system

- Windows PC be connected client p
- Seamless access

◆ **Security**

- Preserve investment in existing systems
- Security of industry standards and clear strategic direction

- Exploit existing
- Microsoft and e support

WOSA Investment

- ◆ **Standards groups**
 - Supporting standards where they exist
 - For example: SAG, XAPIA, X/Open, ANSI, OSF, MMA, SPA
- ◆ **Specification development**
 - Microsoft Open Process: working with other vendors and customers to develop architecture
- ◆ **Development support**
 - Software development kits

Open Database Connect (ODBC)

A standard way for applications to connect to databases

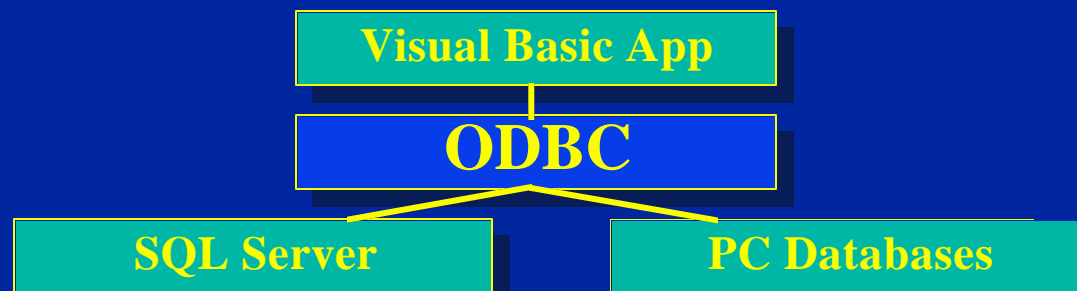
Benefits:

- **Choice:** Access any ODBC compatible database from any vendor
- **Flexibility:** Scale to new data sources without redesign
- **Security:** Based on industry standards
Access Group Call Level Interface

Customer Example

Large US Manufacturer with existing Quality Control application

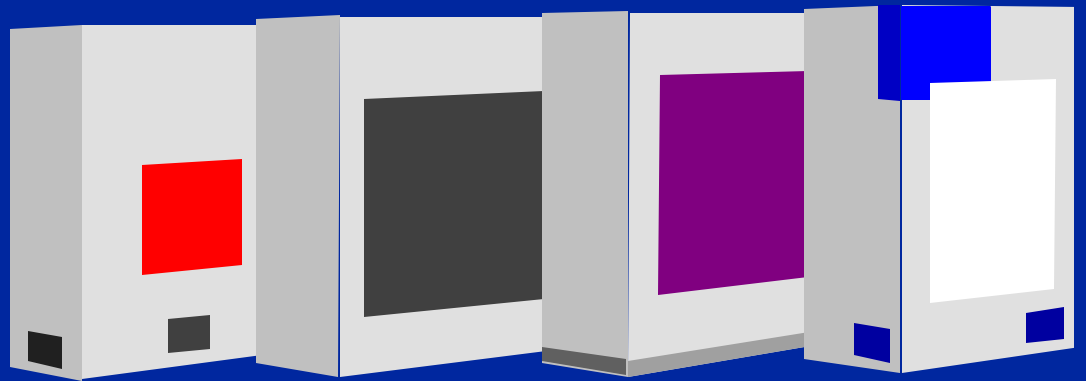
- **Need:** Replicate application at vendor and smaller sites without SQL
- **Solution:** Implement ODBC to create backend flexibility
- **Benefit:** Application can use any backend at any site



VB Access

- ◆ **VB 3.0 Professional includes:**
 - **ODBC Support**
 - **Access database engine**
 - **Variety of data-aware controls**
- ◆ **Third-party controls by Coromai**
Q+E
- ◆ **Access the ODBC APIs directly**

ODBC Demo



ODBC Supporters

(partial list)

- Apple
- Bull HN
- Coromandel
- Fairfield Software
- Hewlett-Packard
- Ingres
- mdba
- Microrim
- Neon Systems
- Page Ahead
- Progress
- Rochester Software
- Sybase
- Unify
- Andyne
- Cincom Systems
- DEC
- Fulcrum Technologies
- Information Builders
- IQ Software
- MicroDecisionware
- Must Software
- Novell
- Pioneer
- Raima
- Seimens
- Tandem
- Vertisoft Research
- Brio
- CCA
- Easel
- Gupta
- Inform
- Lotus
- Micro
- NCR
- Oracle
- Power
- Retix
- Softw
- Unifa
- Watc

Messaging API (MAF)

A messaging architecture that allows applications to connect with services

- **Choice:** Select “Best of Breed” messaging components
- **Flexibility:** Simultaneously access multiple messaging services
- **Security:** Compatibility with future products

Customer Example

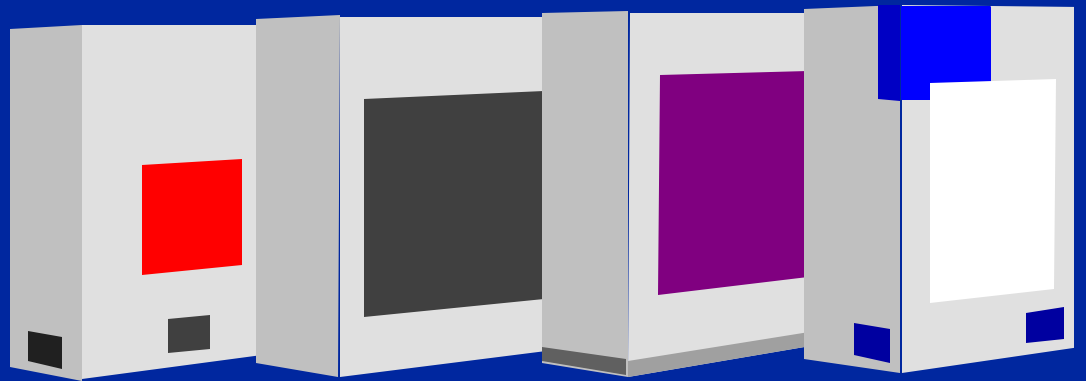
Large corporation with multiple systems installed

- **Need:** Reduce training, support costs associated with multiple user interfaces
- **Solution:** Choose a single Windows messaging interface for all services
- **Benefit:** Provided features users wanted; improved application integration

VB Access

- ◆ **VB 3.0 Professional includes a control for Simple MAPI**
- ◆ **Access the Simple MAPI API directly by declaration**
- ◆ **Coming: VB Control (used by VBA) for CMC**

MAPI Demo



MAPI Supporters

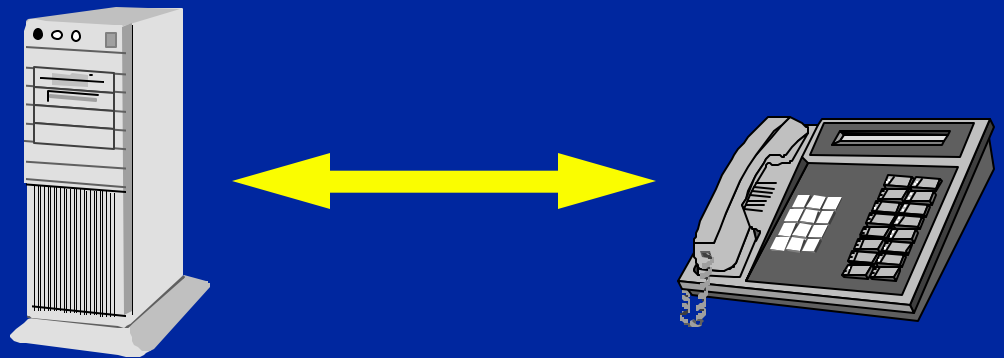
(partial list)

- ♦ **AT&T**
- ♦ **Action Plus Software**
- ♦ **Archive Software**
- ♦ **Banyan**
- ♦ **Beyond**
- ♦ **Calera Recognition**
- ♦ **Capella Systems**
- ♦ **Chronos Software**
- ♦ **Claris**
- ♦ **CompuServe**
- ♦ **Connect Software**
- ♦ **DEC**
- ♦ **Dun & Bradstreet**
- ♦ **Delrina Technology**
- ♦ **ExMachina**
- ♦ **Franklin Quest**
- ♦ **GlobalStream**
- ♦ **Hewlett-Packard**
- ♦ **ISICAD**
- ♦ **JetForm**
- ♦ **Keyfile**
- ♦ **Keyword**
- ♦ **LABTECH's Vision**
- ♦ **Lenel Systems Intl**
- ♦ **Microcom**
- ♦ **Novell**
- ♦ **NUKO Info Systems**
- ♦ **PenKnowledge**
- ♦ **Pilc**
- ♦ **Pol**
- ♦ **Pov**
- ♦ **Pro**
- ♦ **Rai**
- ♦ **Sha**
- ♦ **Sky**
- ♦ **Sof**
- ♦ **Sof**
- ♦ **Syn**
- ♦ **Ver**
- ♦ **Wo**
- ♦ **Wo**
- ♦ **XT**

Windows Telephony A

A standard way to integrate the PC with the telephone

- **Choice:** Wide range of application
- **Flexibility:** Permits integration of n vendor hardware and software
- **Security:** Protects software investm provides future compatibility



Customer Example

Order entry group for a sports apparel manufacturer

- **Need:** Provide more complete, responsive assistance to customers
- **Solution:** Use TAPI to integrate order entry systems with phones
- **Benefit:** Inbound calls bring up the appropriate customer data; outbound calls are autodialed with a mouse click

VB Access

- ◆ **TAPI uses callback functions and dynamic variable-sized data structures not supported in VB**
- ◆ **Can use 3rd-party product that supports callbacks (i.e. SpyWork)**
- ◆ **MS working on a custom control future release**

TAPI Supporters

(partial list)

Telecom Mfgers:

**Alcatel
AT&T
Ericsson
Fujitsu
InteCom
Mitel
NEC
Northern Telecom
ROLM
Siemens
Toshiba**

Telecom Industry:

**Bell Atlantic
Dialogic
Centigram
Natural Microsystems
Octel
US West
VMX**

Computer

**Acer
Analog D
Compaq
Delrina
Intel
Lotus
Microsoft
Motorola
National S**

License Service API

A standard way for applications to connect with license metering systems

- **Choice:** Allows applications to work with any LSAPI licensing server
- **Flexibility:** LSAPI doesn't require applications to follow a particular licensing policy
- **Security:** Works with existing license servers as well as future products

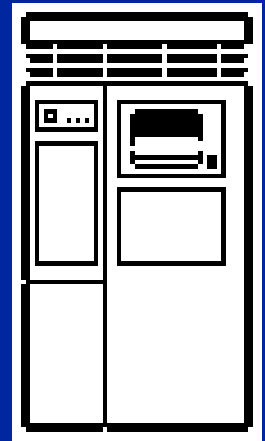
Licensing Example



Application transparently requests permission to run

License request

License grant



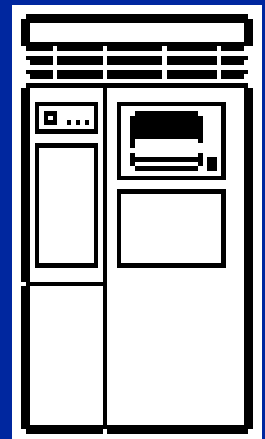
Server finds a valid license and grants permission

Li
al



Application transparently releases the license when it is done

License release



The license is made available to others

Li
de

VB Access

- ◆ **LSAPI SDK not yet available**
- ◆ **MS working on a custom control**

License Service API

(partial list)

- ◆ Apple Computer, Inc.
- ◆ Banyan Systems, Inc.
- ◆ Brightwork Development
- ◆ CompuServe, Inc.
- ◆ Digital Equipment Corporation
- ◆ Funk Software, Inc.
- ◆ Hewlett-Packard Company
- ◆ Highland Software, Inc.
- ◆ InterWorks, Inc.
- ◆ Lotus Development Corporation
- ◆ Microcomputer Association
- ◆ Microsoft Corporation
- ◆ Novell, Inc.
- ◆ Oracle Corporation
- ◆ Open Software Foundation
- ◆ Symantec
- ◆ Software Publishers Association
- ◆ Tangram Systems
- ◆ WordPerfect Corporation

Windows Sockets API

A standard way for applications to communicate with the network

- **Choice:** Makes it easier to integrate Windows and UNIX applications across a network
- **Flexibility:** Supports both connection-oriented and connectionless protocols
- **Security:** Based on the de facto network standard, Berkeley Sockets

Case Study: NT SQL Server

- ◆ Originally implemented with TCP/IP
- ◆ Conversion to utilize IPX/SPX sockets quick and painless: two weeks
- ◆ On-the-wire compatibility with existing Netware and TCP/IP SQL clients
- ◆ Well positioned to adopt additional transports in the future
- ◆ Result: world-class performance, single transport model, full interoperability with existing clients

Windows Sockets Support

(partial list)

- ◆ 3Com Corporation
- ◆ AGE Logic Inc.
- ◆ Beame & Whiteside Software
- ◆ Digital Equipment Corporation
- ◆ District Corporation
- ◆ Frontier Technologies Group
- ◆ FTP Software
- ◆ Hewlett-Packard Company
- ◆ Hughes LAN Systems
- ◆ IBM
- ◆ Ingres, an Ask company
- ◆ JSB Corporation
- ◆ Microsoft Corporation
- ◆ Net Manage
- ◆ Network Resources Corporation
- ◆ Novell, Inc.
- ◆ Sun Microsystems
- ◆ Ungermann-Bass
- ◆ Walker, Richard
- ◆ Wollongong

Windows SNA

A standard way to connect with host-based Systems Network Architecture (SNA) services in Windows

- **Choice:** Common API for Windows and Windows NT (16-bit and 32-bit)
- **Flexibility:** Single interface integrates products from multiple vendors
- **Security:** Includes full support for the SNA categories

Windows SNA Suppor

(partial list)

- ◆ Attachmate
- ◆ Andrew Corporation
- ◆ Computer Logics
- ◆ Data Connection
- ◆ Digital Communications Associates
- ◆ Easel
- ◆ Eicon Technology
- ◆ FutureSoft
- ◆ IBM
- ◆ ICOT
- ◆ International Co
- ◆ Microsoft Corpo
- ◆ Multisoft
- ◆ NCR
- ◆ Network Softwar
- ◆ Novell
- ◆ Olivetti
- ◆ Siemens-Nixdorf
- ◆ Systems Strategy
- ◆ Wall Data, Inc.

Windows RPC API

A standard way for building distributed applications using Remote Procedure Calls (RPC) in Windows

- **Security:** Compatible with Open Security Foundation's (OSF) Distributed Computing Environment (DCE) RPC protocol

WOSA

Extensions For Financial Services

A general architecture and standard interfaces that provide access to:

- ◆ Specialized peripherals
- ◆ Communications
- ◆ Financial transaction messaging
- ◆ Network and system management

BOB JONES		2048
DATE _____		
PAY TO THE ORDER OF _____		\$ _____
_____		100/100
FIRST NATIONAL BANK		

100 2100 661 770 111 3640 76 2121		

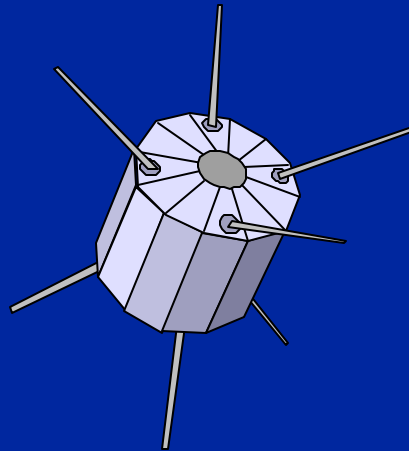
WOSA Extensions For Financial Services Supporters

Banking Systems Vendor Council

- Andersen Consulting
- Atalla/Tandem
- Digital Equipment Corp.
- EDS
- ICL-Fujitsu
- Microsoft Corp.
- NCR
- Olivetti
- Siemens Nixdorf
- Unisys Corp.

WOSA Extensions For Real-Time Market]

- ◆ Interfaces defined to allow any Windows applications to access time market data from any prov



VB Access

- ◆ **Use pure OLE automation**
 - **Use a timer control and call the WOSA/XRT Object's 'DataItem' on each tick to get the latest data**
- ◆ **Write a custom VBX**
 - **This would fire events into VB code RT data changes**
- ◆ **Future: OLE Controls that are WOSA/XRT objects**

WOSA Extensions For Real-Time Market Data Supporters

Windows Open Market Data Connectors

- Andersen Consulting
- A-T Financial
- ARTS
- Digital Equipment Corp
- FD Consulting
- ILX
- Knight-Ridder
- Market Vision
- Microsoft Corporation
- Quotron
- Reuters
- S&P ComScore
- Siemens Nixdorf
- Townsend
- Teknekron
- Telerate
- Track Data

WOSA Extensions For Controls, Engineering and Manufacturing

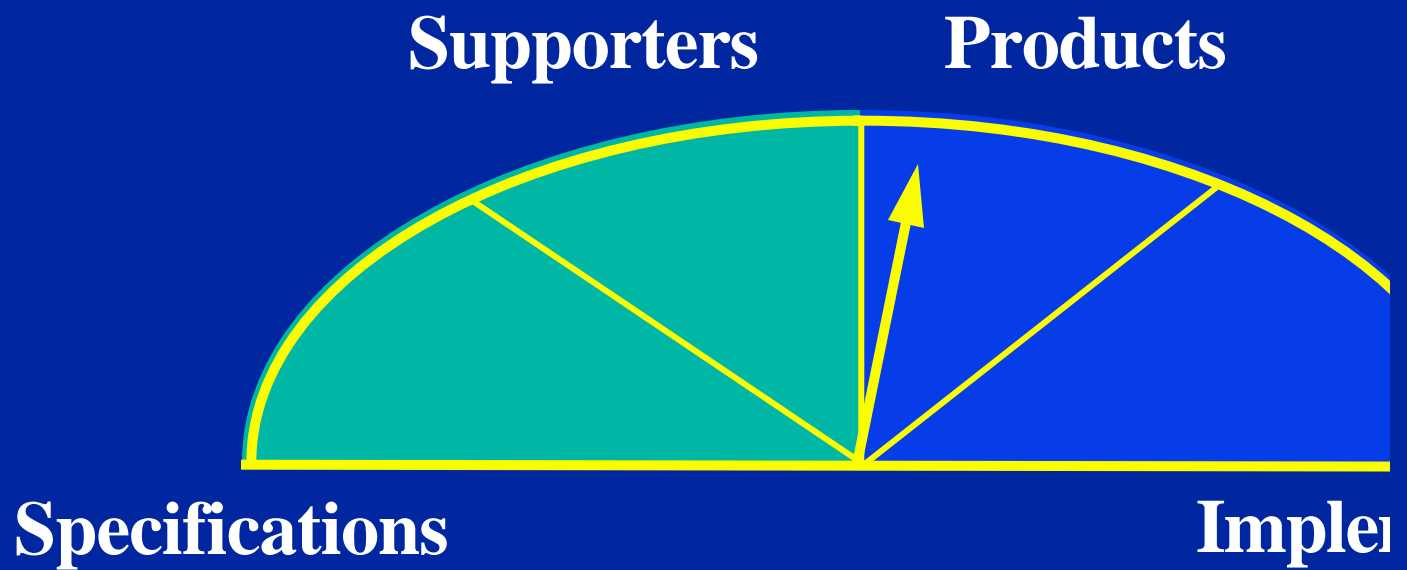
- ◆ **Reduce the time and cost involved developing solutions for the manufacturing industry**

WOSA Extensions For Controls, Engineering and Manufacturing

Windows Controls, Engineering and Manufacturing (CEM) Systems Companies

- American Advantech Corporation
- Bio-RAD
- Bioscan
- Cambridge
- Scientific Computing, Inc.
- Control Technology
- Data Translation
- Digital
- Equipment Corporation
- Dynapro Systems, Inc.
- Hewlett-Packard Company
- Hopkins Co
- ICOM
- Iconics
- Industrial S
- Intellution, I
- Intuitive Te
- Microsoft C
- National Ins
- RadiSys
- Strawberry
- Ziatech

WOSA Timescale



WOSA Next Steps

- ◆ **Foster implementations around current services**
 - Data Access, Messaging, Telephony, Software Licensing
 - Communications
 - Vertical market extensions
- ◆ **Conduct “open process” around possible future services**
 - Directory Services
 - Distributed Security
 - Systems Management
 - Other Vertical Markets

Summary

- ◆ WOSA is a collection of system-level building blocks
- ◆ Connects to heterogeneous services
- ◆ Provides **Choice, Flexibility** and **Security** in application design and development