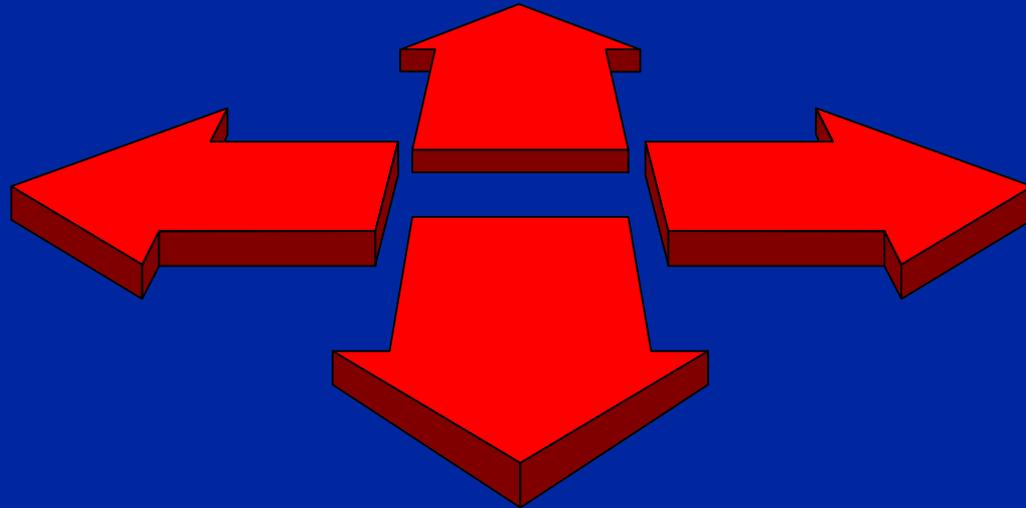


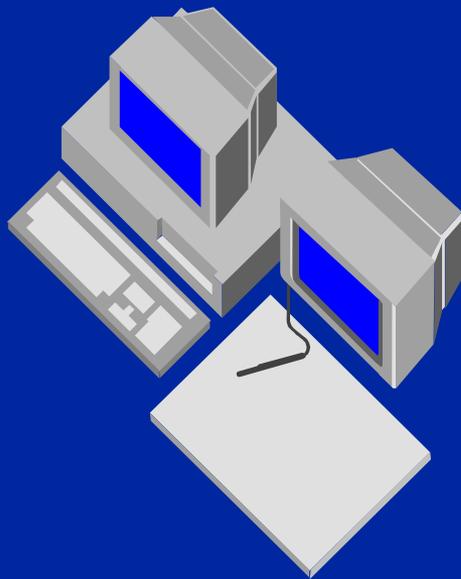
Windows™ Open Services Architecture (WOSA)



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Microsoft Corporation

WOSA Description

Open architecture that enables Windows and Windows NT work-stations to connect to a wide range of services in a heterogeneous environment

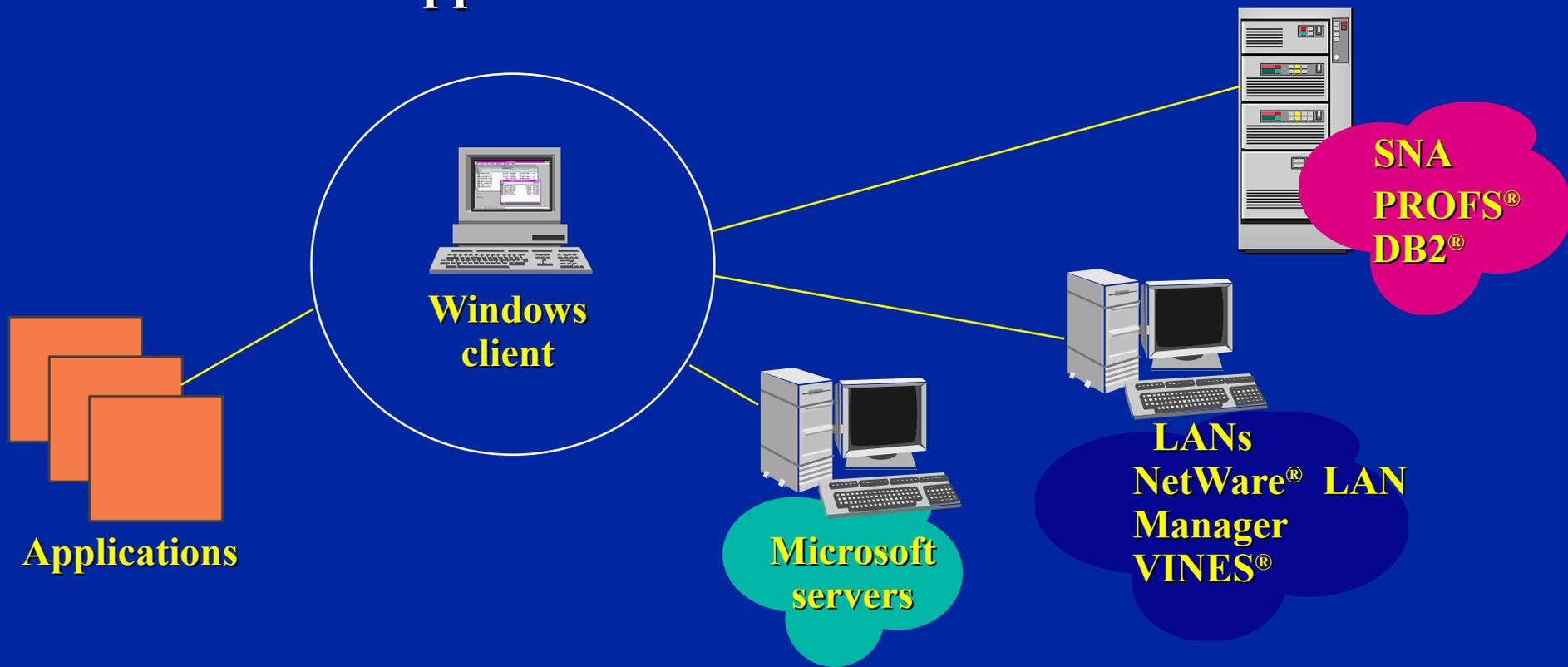


Need For An Open Services Architecture

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 way to connect applications with services



WOSA Services

Common application services

Data Access: Open Database Connectivity (ODBC)

Messaging: Messaging API (MAPI)

Licensing: License Service API (LSAPI)

Telephony: Telephony API (TAPI)

Communication services

Windows Sockets API

Windows System Network Architecture (SNA) API

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

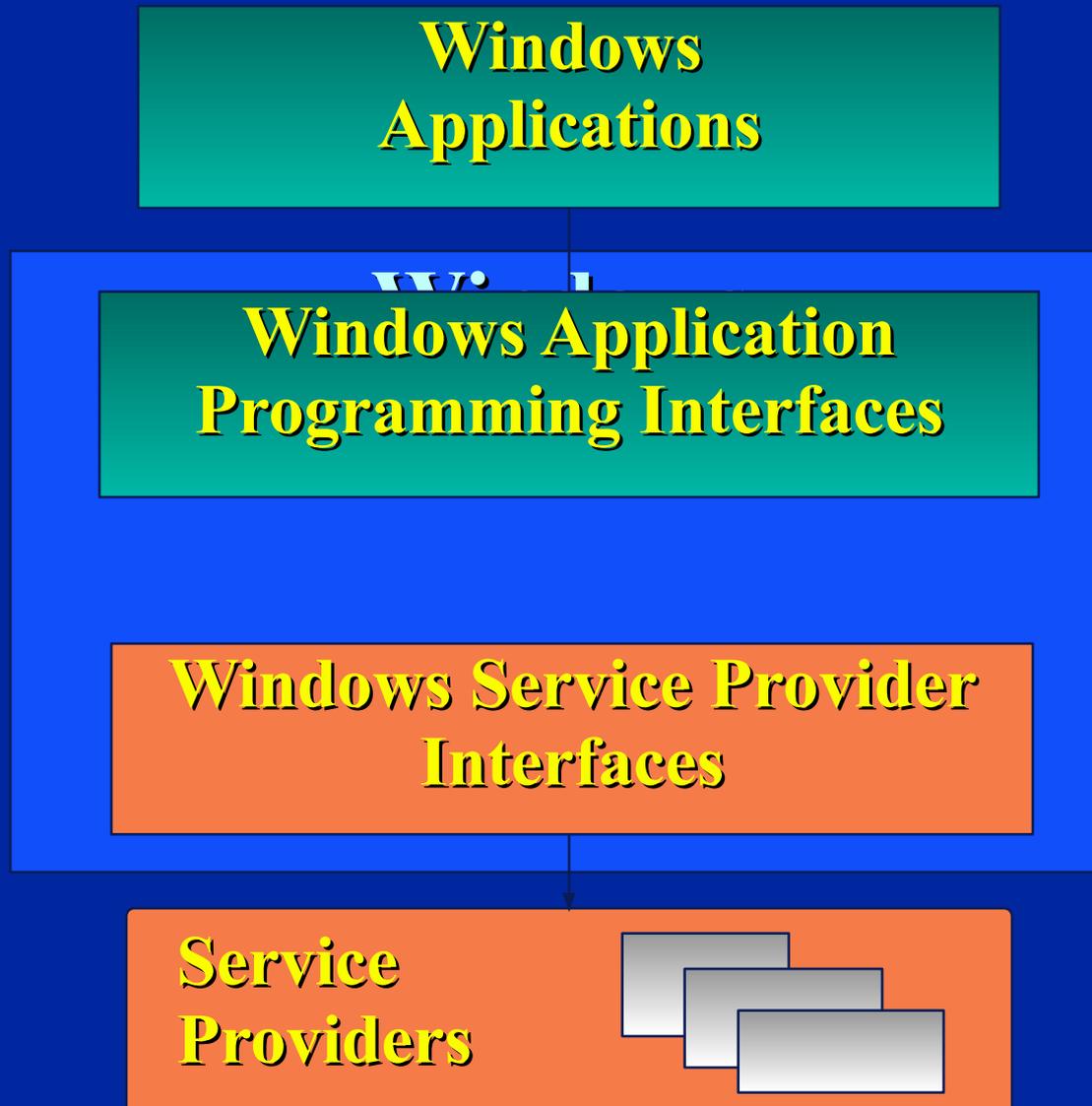
Make application development easier with a consistent set of interfaces

Provide an open interoperability architecture for everyone to work together

Establish consensus with Microsoft's Open Process

Establish Windows as the best-connected client platform

WOSA Architecture



WOSA Meets Today's Requirements

Requirement

Microsoft Response

Choice

Standardize programming interfaces
Leverage investment toward future systems

Standard API's and SPI's

Heterogeneous connectivity

Flexibility

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

Windows PC becomes best-connected client platform

Seamless access

Security

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

Exploit existing architectures

Microsoft and extensive ISV 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 design the
architecture**

Development support

Software development kits

Open Database Connectivity (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 standard SQL 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

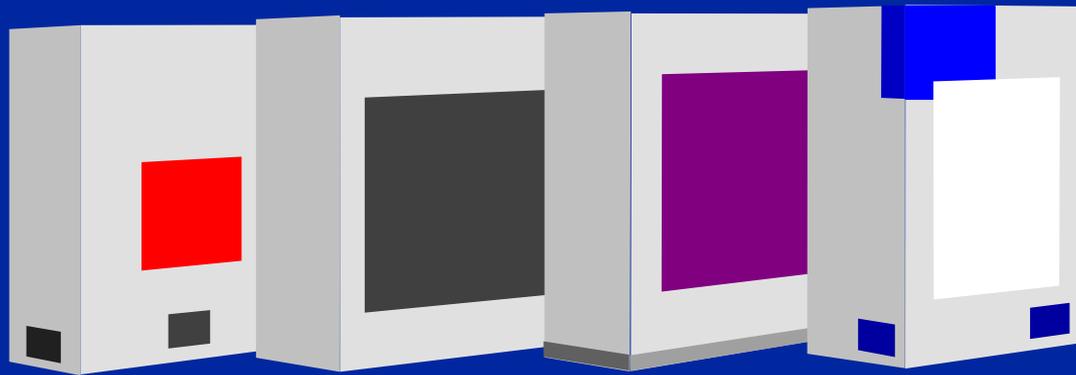
Access database engine

Variety of data-aware controls

Third-party controls by Coromandel, Q+E

Access the ODBC APIs directly

ODBC Demo



ODBC Supporters (partial list)

- Apple
- Andyne
- Brio
- Bull HN
- Cincom Systems
- CCA
- Coromandel
- DEC
- Easel
- Fairfield Software
- Fulcrum Technologies
- Gupta
- Hewlett-Packard
- Information Builders
- Informix
- Ingres
- IQ Software
- Lotus
- mdbs
- MicroDecisionware
- Microsoft
- Microrim
- Must Software
- NCR
- Neon Systems
- Novell
- Oracle
- Page Ahead
- Pioneer
- Powersoft
- Progress
- Raima
- Retix
- Rochester Software
- Seimens
- Software AG
- Sybase
- Tandem
- Uniface
- Unify
- Vertisoft Research
- Watcom

Messaging API (MAPI)

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 mail 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

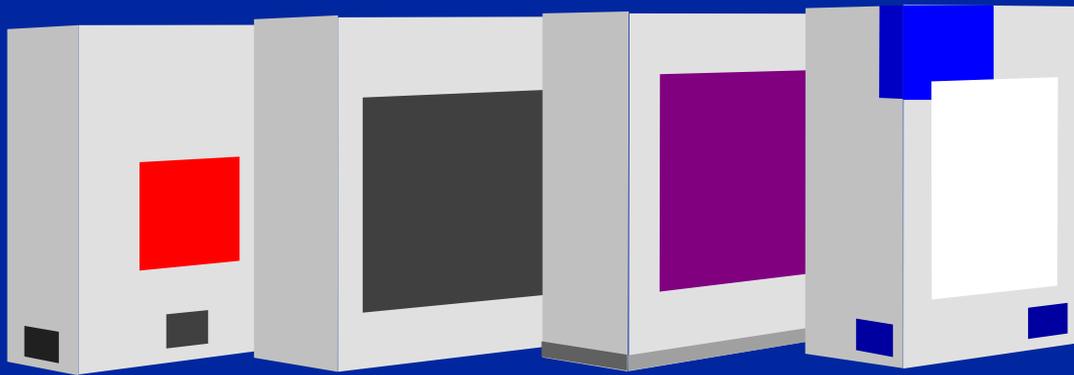
VB Access

VB 3.0 Professional includes a custom control for Simple MAPI

Access the Simple MAPI API directly by declaration

Coming: VB Control (used by VB, 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

Pilot Software

Polaris

Powercore

Prometheus

Raindrop Software

Shapeware

SkyTel

SoftSwitch

Software Publishing

Symantec

Ventana

WordStar

WordPerfect

XTree Company

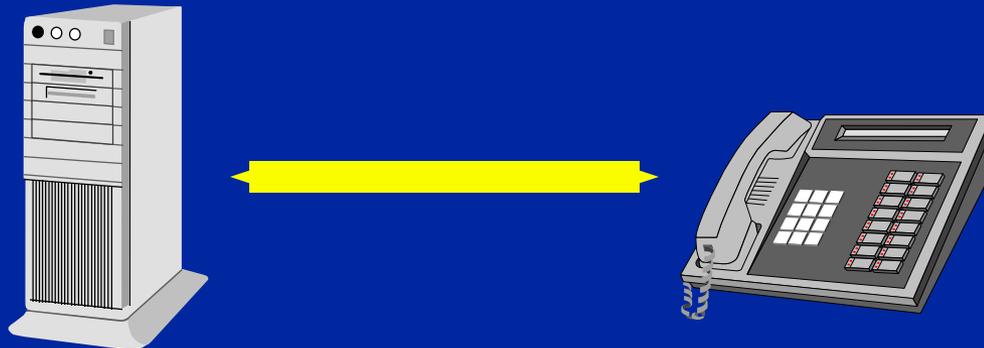
Windows Telephony API

A standard way to integrate the PC and the telephone

Choice: Wide range of application choices

Flexibility: Permits integration of multi-vendor hardware and software

Security: Protects software investment and 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. SpyWorks)

MS working on a custom control for 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 Industry:

Acer
Analog Devices
Compaq
Delrina
Intel
Lotus
Microsoft
Motorola
National Semiconductor

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 licensing servers as well as future products

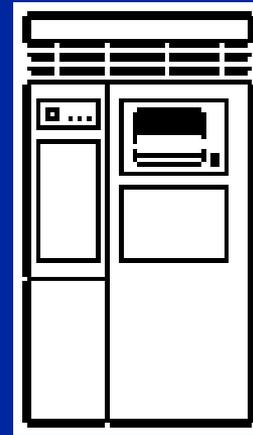
Licensing Example



Application transparently requests permission to run

License request

License grant



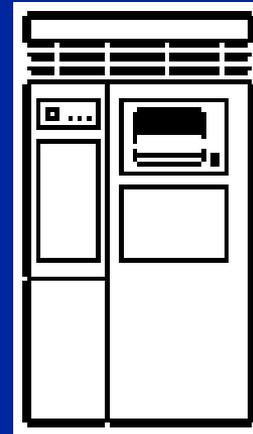
Server finds a valid license and grants permission

License is allocated



Application transparently releases the license when it is done

License release



The license is made available to others

License is deallocated

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 Managers
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 both Windows and UNIX applications across a network

Flexibility: Supports both connection-oriented and connectionless protocols

Security: Based on de facto network API standard, Berkeley Sockets

Case Study: NT SQL Server

Originally implemented with TCP/IP sockets

Conversion to utilize IPX/SPX sockets was 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 Supporters

(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 Inc.

**Network Research
Corporation**

Novell, Inc.

Sun Microsystems, Inc.

Ungermann-Bass

Walker, Richard & Quinn

Wollongong Group

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 key SNA categories

Windows SNA Supporters

(partial list)

Attachmate

Andrew Corporation

Computer Logics

Data Connection

**Digital Communications
Associates**

Easel

Eicon Technology

FutureSoft

IBM

ICOT

International Computers Ltd.

Microsoft Corporation

Multisoft

NCR

Network Software Associates

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 Software 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 _____	\$ _____
	_____ DOLLARS
FIRST NATIONAL BANK	

⑆00 2100 55⑆ 770⑆⑆ 554075⑆ 2121	

WOSA Extensions For Financial Services Supporters

Banking Systems Vendor Council

Andersen Consulting

Atalla/Tandem

Digital Equipment Corp.

EDS

ICL-Fujitsu

Microsoft Corporation

NCR

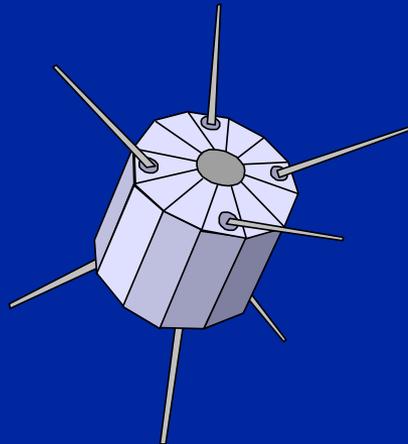
Olivetti

Siemens Nixdorf

Unisys Corporation

WOSA Extensions For Real-Time Market Data

Interfaces defined to allow any Windows applications to access real-time market data from any provider



VB Access

Use pure OLE automation

Use a timer control and call the WOSA/XRT Object's "DataItem" methods on each tick to get the latest data

Write a custom VBX

This would fire events into VB code when RT data changes

Future: OLE Controls that are WOSA/XRT objects

WOSA Extensions For Real-Time Market Data Supporters

Windows Open Market Data Council

Andersen Consulting

A-T Financial

ARTS

Digital Equipment Corp

FD Consulting

ILX

Knight-Ridder

Market Vision

Microsoft Corporation

Quotron

Reuters

S&P ComStock

Siemens Nixdorf

Townsend Analytics

Teknekron

Telerate

Track Data

WOSA Extensions For Controls, Engineering and Manufacturing

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

WOSA Extensions For Controls, Engineering and Manufacturing

Windows Controls, Engineering and Manufacturing (CEM) Systems Council

American Advantech Corporation

Bio-RAD

Bioscan

Cambridge

Scientific Computing, Inc.

Control Technology

Data Translation

Digital

Equipment Corporation

Dynapro Systems, Inc.

Hewlett-Packard Company

Hopkins Computing

ICOM

Iconics

Industrial Systems, Inc.

Intellution, Inc.

Intuitive Technology

Microsoft Corporation

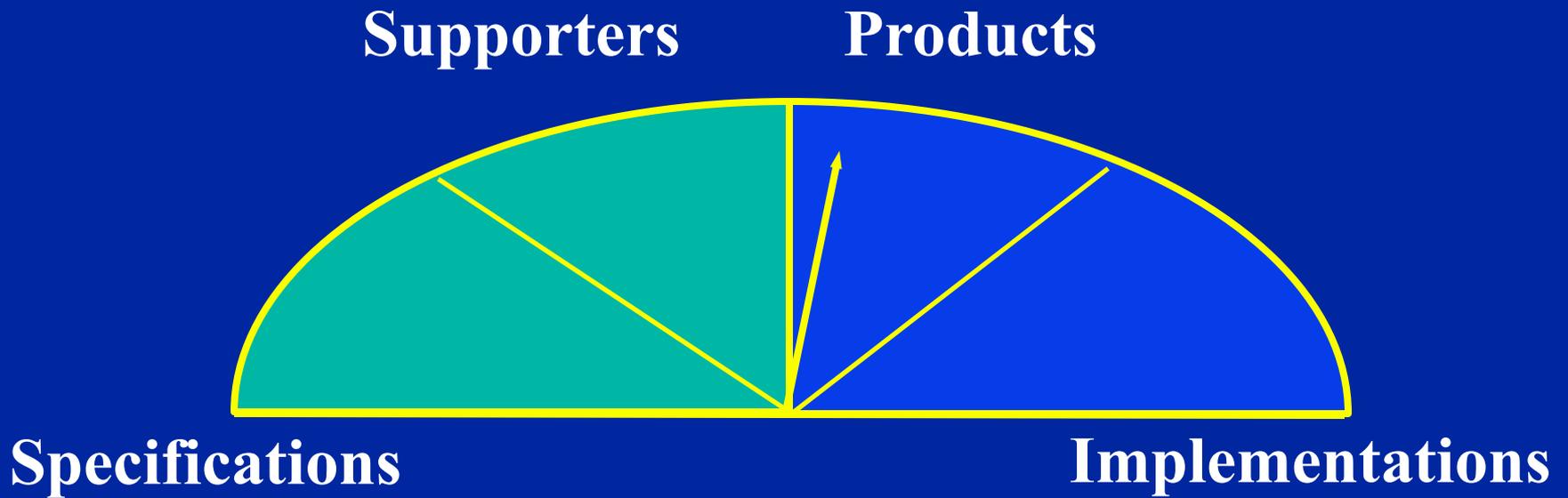
National Instruments

RadiSys

Strawberry Tree

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 usage