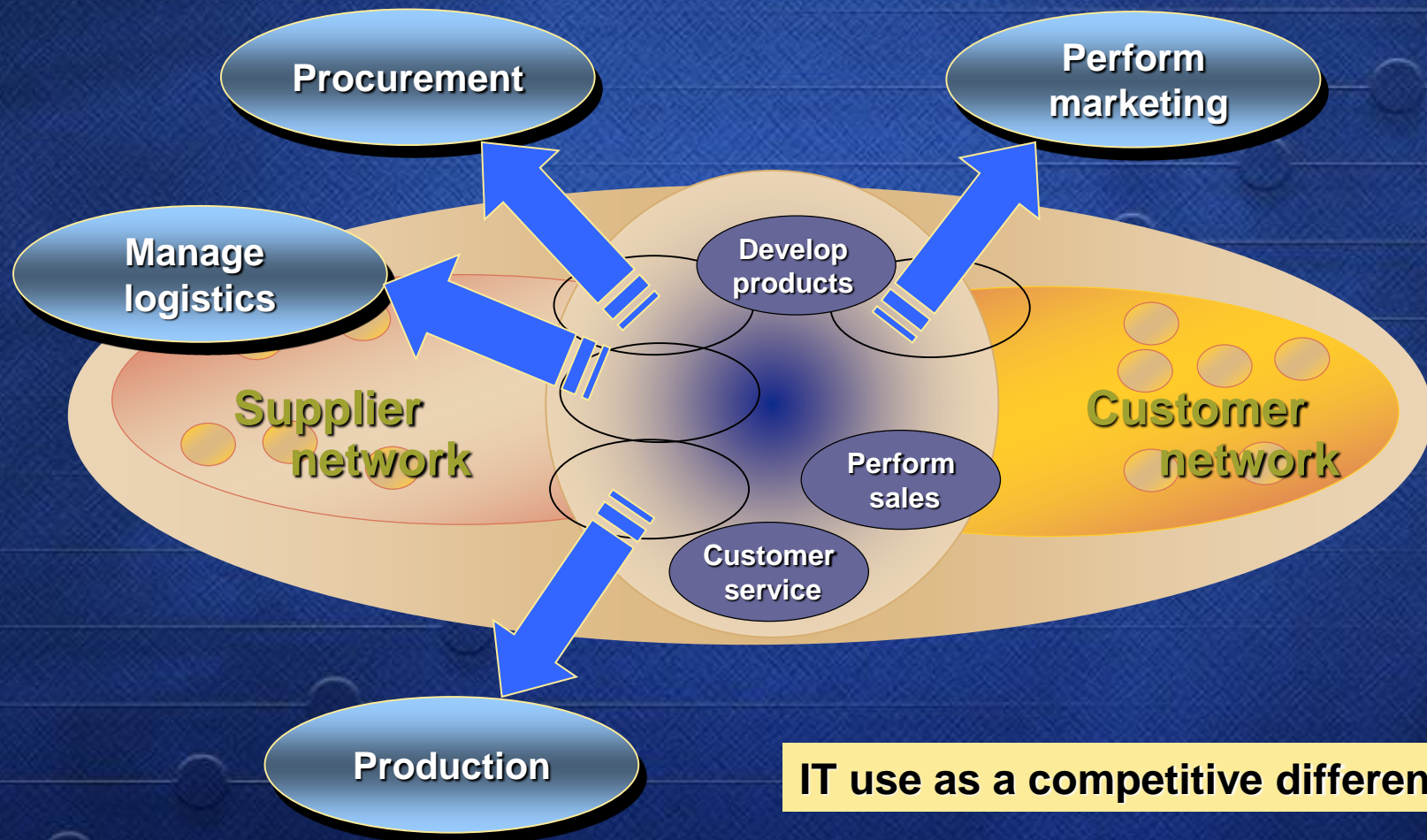# Bringing Innovation to Process Industries

Lorenzo Pengo
Managing Director Manufacturing Industries Unit
Microsoft EMEA

Key Objective : Enterprise Agility
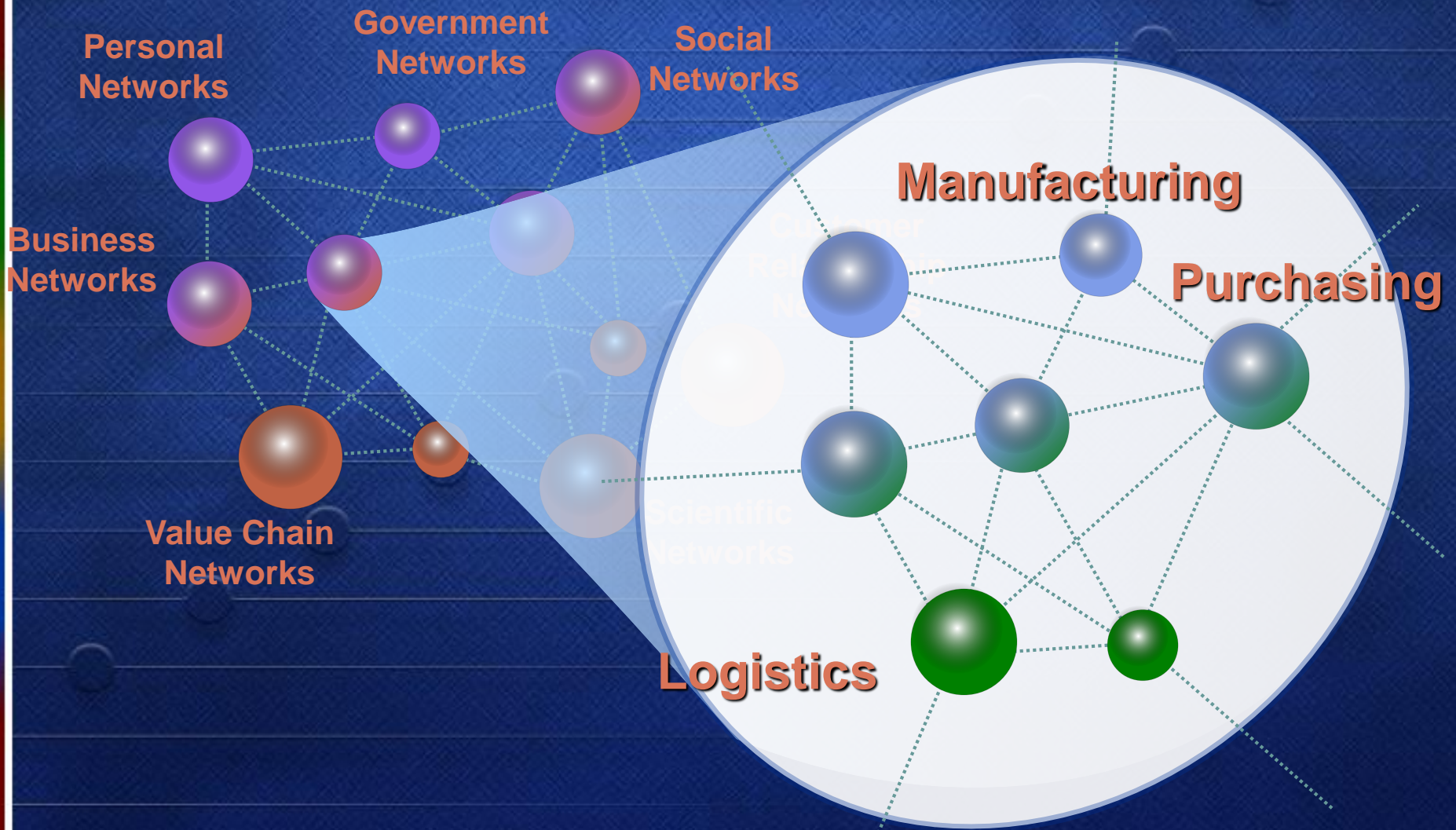## Define, build and deploy the "real-time" value chains

Procurement

Perform marketing

Manage logistics

Develop products

Supplier network

Customer network

Perform sales

Customer service

Production

IT use as a competitive differentiator

- **Focus on core competences**
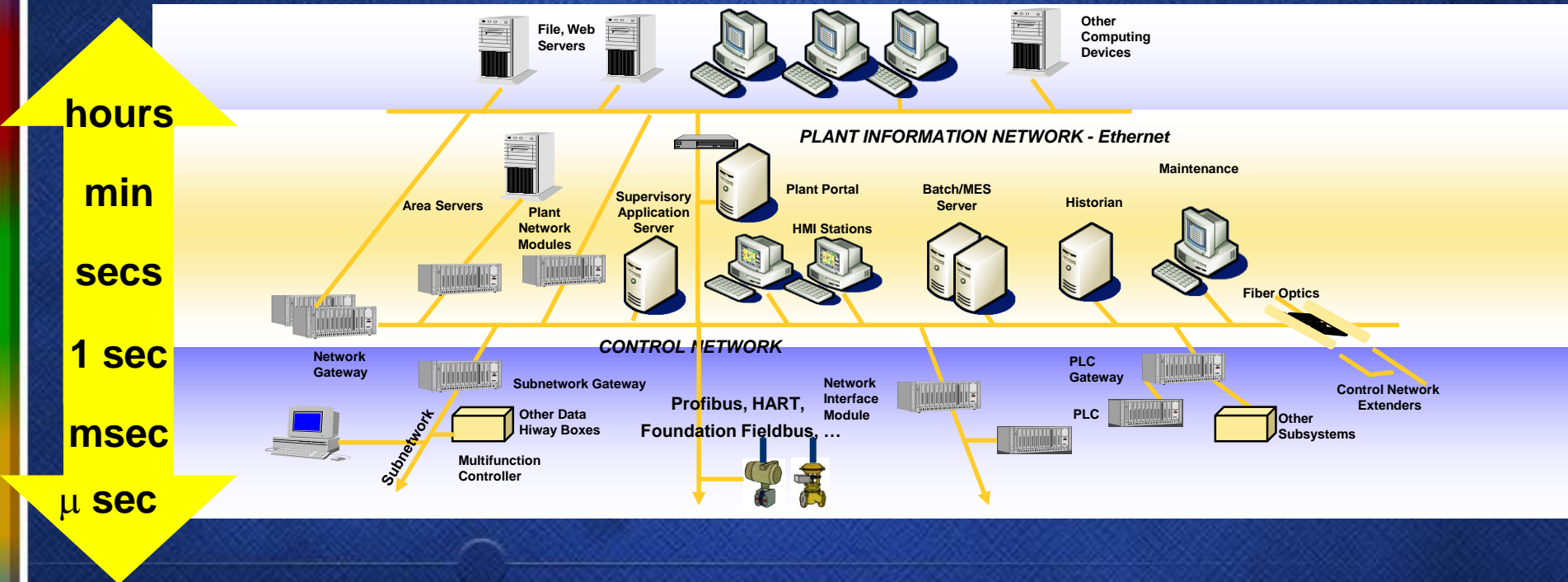- **A transformed business will outsource much of its activities**
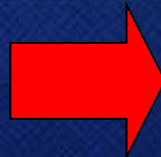
- **Governance - Ownership**
- **Flexibility**
- **Product and Process Consistency**
- **Customer Focus**

Source : PWC Consulting

Services Everywhere

Personal Networks

Government Networks

Social Networks

Business Networks

Value Chain Networks

Manufacturing

Purchasing

Logistics

The Plant : a Complex Environment

hours
min
secs
1 sec
msec
μ sec

File, Web Servers
Other Computing Devices

PLANT INFORMATION NETWORK - Ethernet

Area Servers
Plant Network Modules
Supervisory Application Server
Plant Portal
HMI Stations
Batch/MES Server
Historian
Maintenance
Fiber Optics

CONTROL NETWORK

Network Gateway
Subnetwork Gateway
Subnetwork
Other Data Hiway Boxes
Multifunction Controller
Profibus, HART, Foundation Fieldbus, …
Network Interface Module
PLC Gateway
PLC
Control Network Extenders
Other Subsystems

⟳ **Asynchronous Processing**

⟳ **Multiple interfaces**

⟳ **Mission Critical**
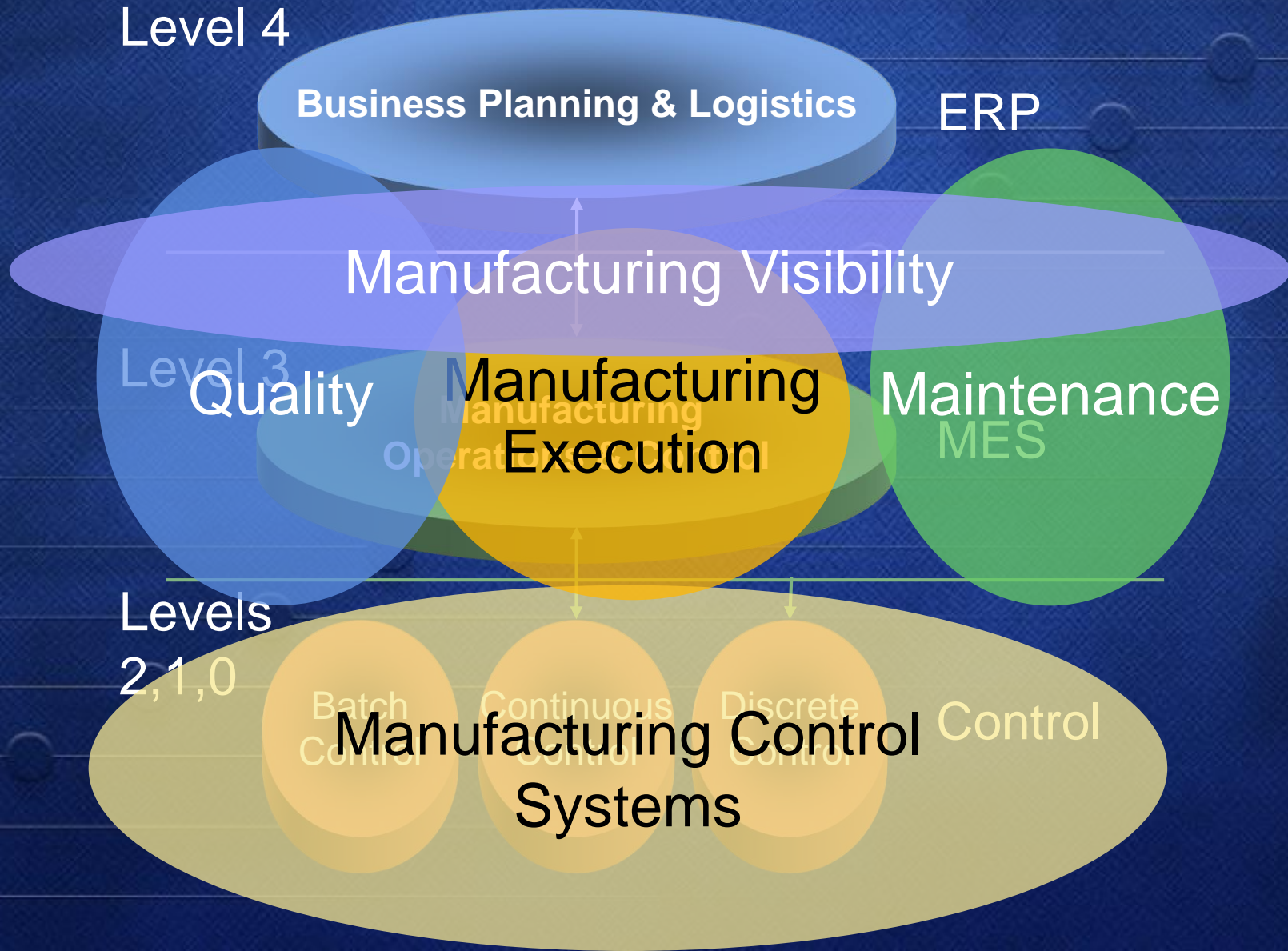
⟳ **How to manage changes?**

⟳ **Complex information flows**

⟳ **Multivendor**

⟳ **Proprietary**

Key is to combine Realtime operations with Transactional systems

The Information Challenge in Process Manufacturing

- Need for collaboration through different disciplines (R & D, Marketing, Engineering, LOB) and inside silos

- Share Information about up-scaling of new or modified products

- Information Management of Quality Assurance Data

- Analytical Process Control Data and validation

- Real Time Collaboration !!!

- Production Audit

- Need for easy access to information across the process

- Combine Real-time data with transactional data … on a fly

- From Plant Floor to TopFloor (SAP) Integration

ISA-95 Functional Hierarchy

Level 4

Business Planning & Logistics

ERP

Manufacturing Visibility

Level 3

Quality

Manufacturing Execution

Maintenance

Manufacturing Operations

MES

Levels 2,1,0

Batch Control

Continuous Control

Discrete Control

Control

Manufacturing Control Systems

Openness

A standard object model and set of interfaces for applications and servers

Productivity
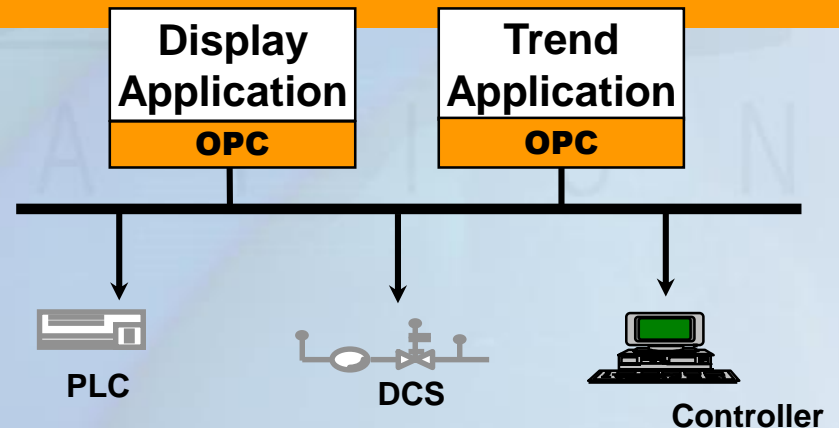
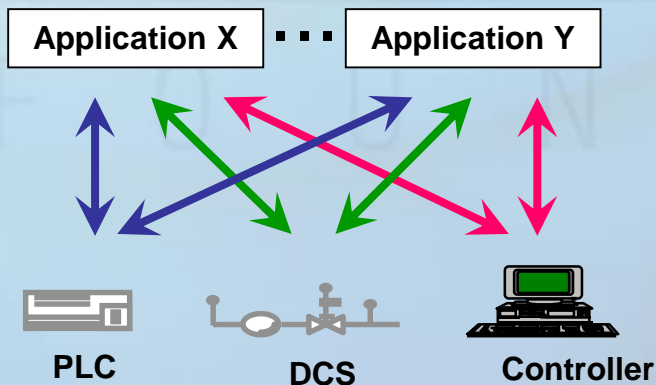**Before OPC:**
Custom interfaces
- **costly**
- **inefficient**
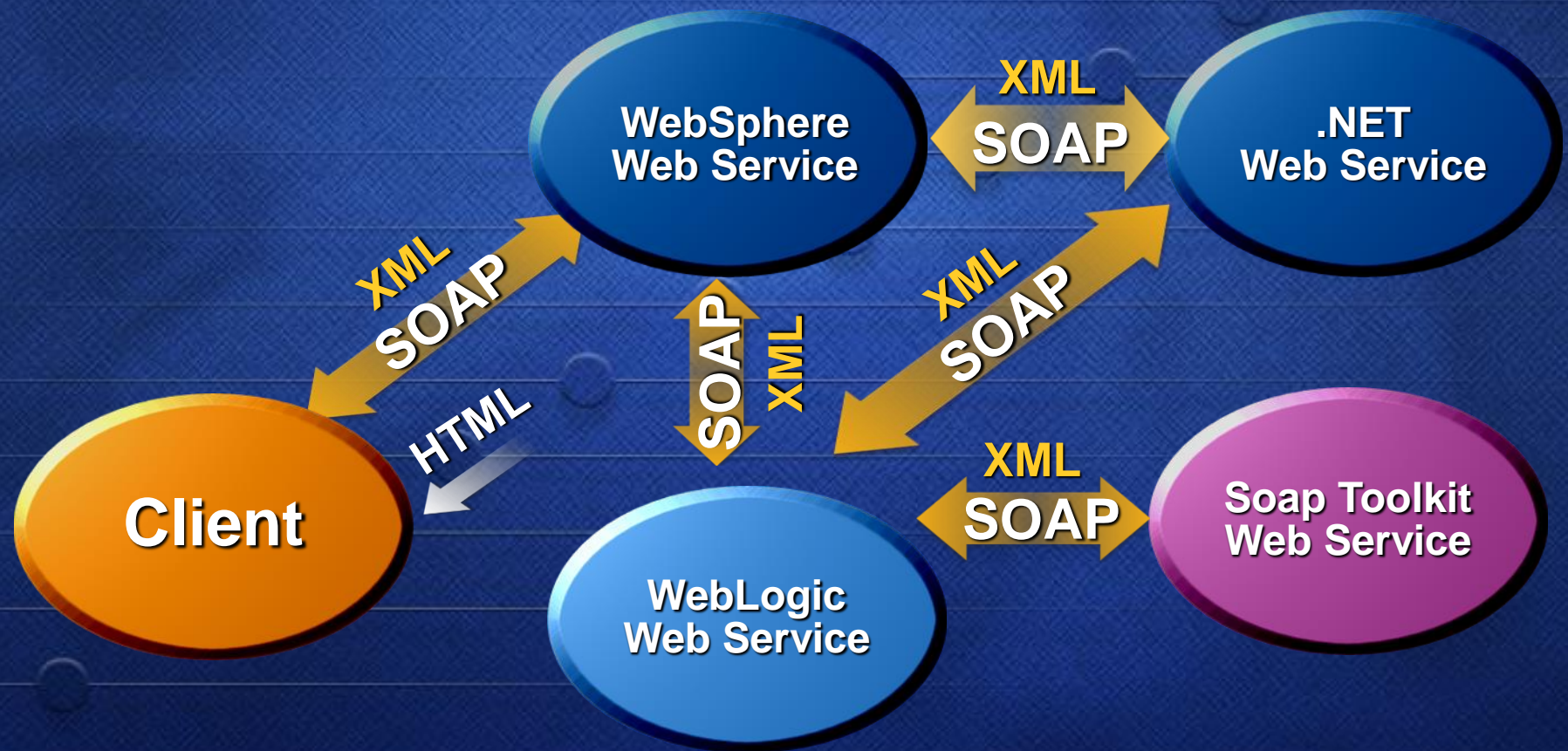- **risky**
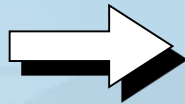
With OPC:
Client and Server write to a standard
- **reduce cost**
- **protect investment**
- **more choices**
- **increase productivity**

Connectivity

| Application X | ••• | Application Y |

PLC   DCS   Controller

| Display Application | Trend Application |
| OPC | OPC |

PLC   DCS   Controller

Web Services
Platform Neutral Software Components

OPC Unified Architecture

What is the OPC Unified Architecture?

- **Web Service & XML based**
- **Interoperability Framework / Infrastructure**
- **Unifies existing OPC specifications**
- **Adds Key Functionality**
- **Leverages / Collaboration with Existing Standards**
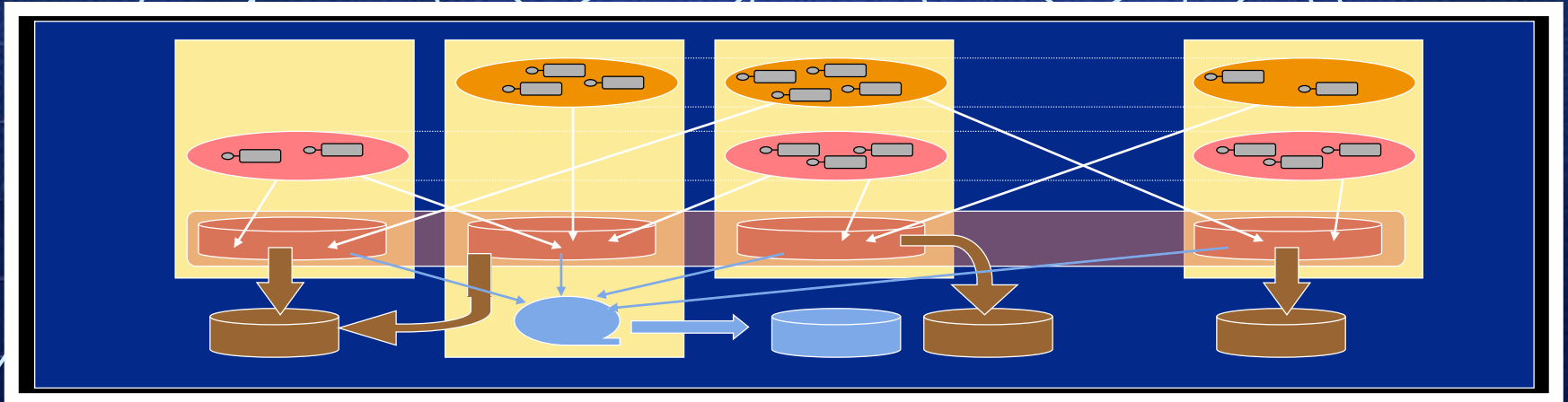- **Seamless integration with installed base of existing OPC based products**

Integrating People, Processes and Technology

Business Processes
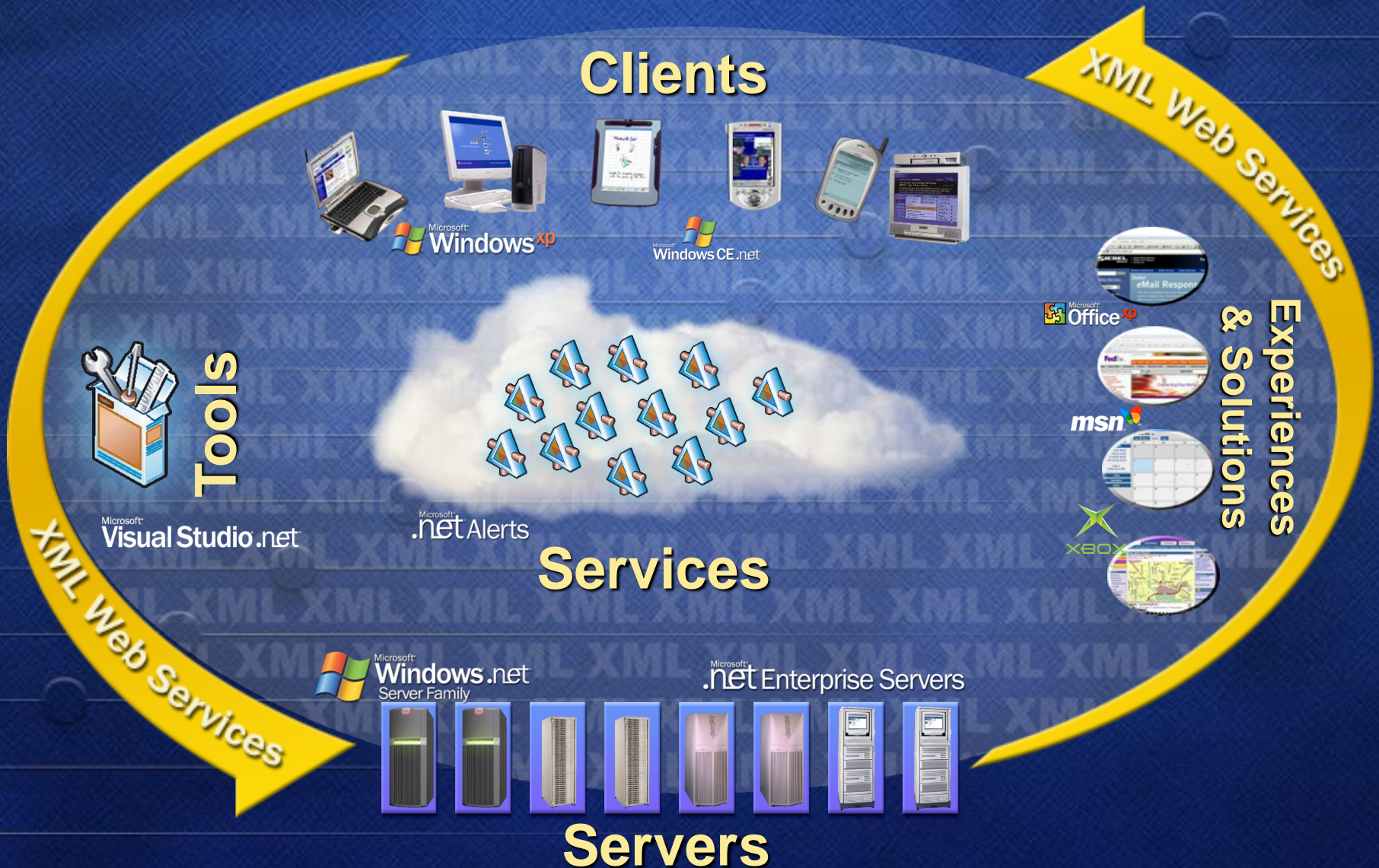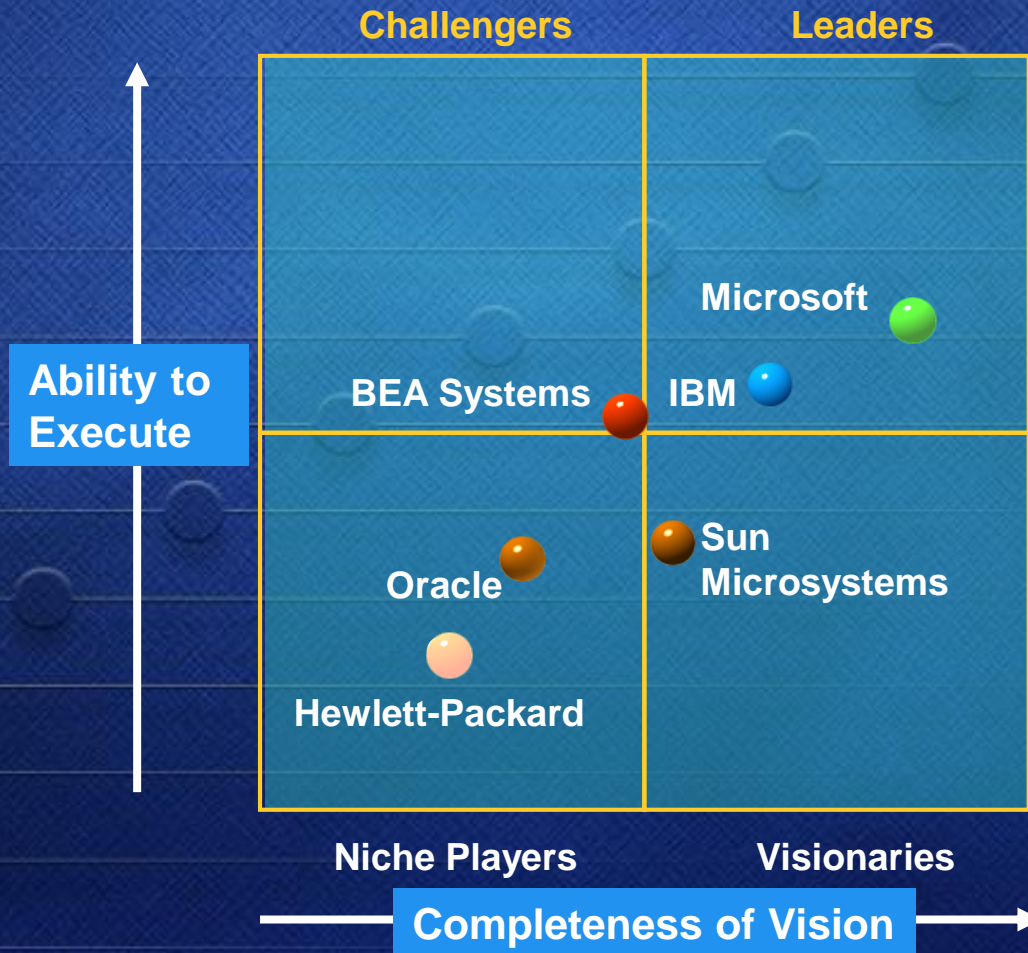
Financials

Technology

Manufacturing

Supply Chain

Leader in the Industry Web Services Effort

'Major Vendor Web Services Platform Influence Magic Quadrant'

Challengers   **Leaders**

Ability to Execute

Microsoft

BEA Systems   **IBM**

Sun Microsystems

Oracle

Hewlett-Packard

Niche Players   **Visionaries**

Completeness of Vision

*Source: Gartner Research

Win 2003 : Build for Quality

Better Customer Connection

- ► 100+ joint development customers
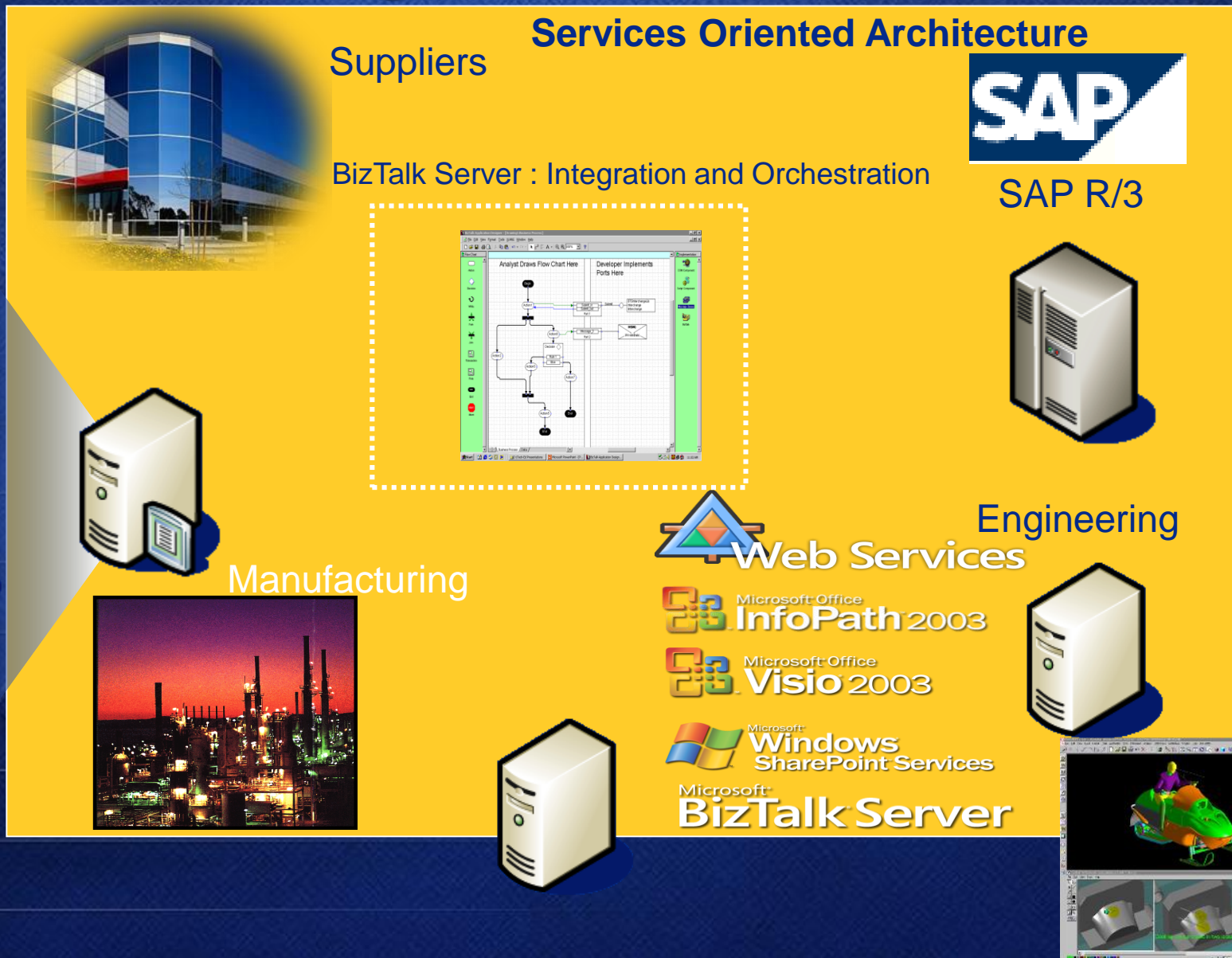- ► 10K production deployments
- ► 1 million pre-release copies

Better Product

- ► Role-based design
- ► Downtime reduced 8x over NT4
- ► Software Update Services
- ► 2x better performance

Better Development Process

- ► Management technology priority
- ► Shared error data with partners
- ► IIS 6.0 – major improvements

Integrating the Manufacturing Enterprise

Services Oriented Architecture

Suppliers

SAP

SAP R/3

BizTalk Server : Integration and Orchestration

Manufacturing

Engineering

Web Services

Microsoft Office InfoPath 2003

Microsoft Office Visio 2003

Microsoft Windows SharePoint Services

Microsoft BizTalk Server

Value of Microsoft Office System in Manufacturing

Key Challenge:

Improve collaboration and productivity throughout the manufacturing process

- Typically paper-based
- Manual data aggregation
- Large prep time for presentation of data and results
- Need to link all related quality management documentation

Microsoft Office System Based Solution

- Creation, sharing & discussion unstructured & structured documents
- Enhanced collaboration with engineering & other experts
- Streamlined report generation process with workflow for review & approval
- Integrated document security and protection of IP
- Searchable and Secure Repository

Office System in Practice and Real Time
Performance Management (Process Mfg)

Case Study

- The opportunity to profit from information is directly proportional to how fast you act on that information. We see a future where Information Workers are transformed into "Real-time Information Workers," dramatically increasing corporate agility.

- RtPM solutions enables people to make better, faster decisions by giving secure, immediate, role-based, real-time access to both operational and corporate information.

- We accomplish this through deep leverage of the Microsoft Windows 2003 Server and Office 2003 Systems. No other platform does this

Benefits: Savings in maintenance costs

Savings in lower reject rates

Access to operational & corporate information

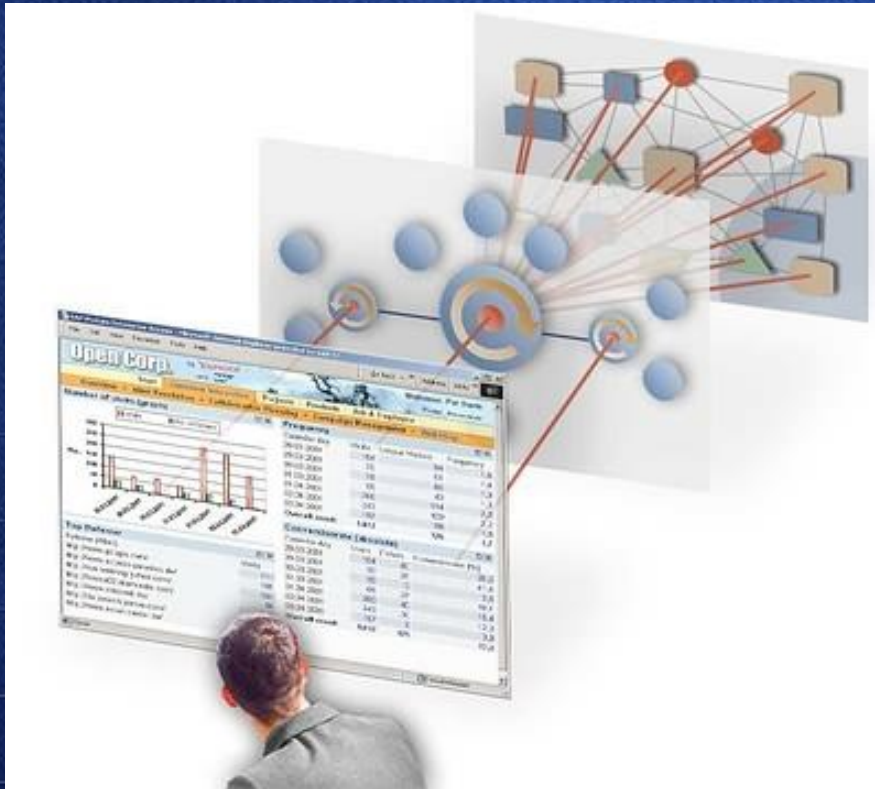# Integration and Collaboration across Italcementi Network hidden complexity to end-user

Key Benefits :

- **One Integrated Environment across the company and across different systems**

- **Leverage common Office Productivity Tools as Interface to Line of Business applications**

- **Microsoft Tools do Open the ERP environment**

- **Time to Market : 50% saving from design to production (target)**

Plant Floor Security

Goal

Protect plant floor computing assets

Focus

- Assess server and workstation risks for security vulnerabilities
- Develop risk matrix of plant floor computing systems
- Review existing plant floor security processes
- Provide guidance to protect servers and workstations against security attack
- Provide guidance for network security
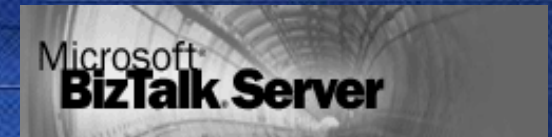- Identify plan to mitigate identified security risks
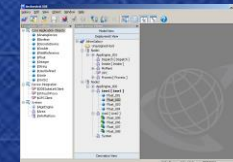
ISA-95 Functional Hierarchy and MS Technologies

Level 4
Business Planning & Logistics ERP

Level 3
Quality Manufacturing Execution Maintenance MES

Manufacturing Operations & Control

Levels 2,1,0
Batch Control Continuous Control Discrete Control

Manufacturing Control Systems

Manufacturing Visibility

Embedded