# Open Systems and Virtual Reality:
# The Role of Standards in Creating a Market

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*VR93, San Jose, May 21,1993*

# Overview of Talk

- **Open Systems**
- **Standards Process**
- **User Interface**
- **U.S. Government Activities FCCSET — VR Task Group**
- **Future Scenarios — Markets**

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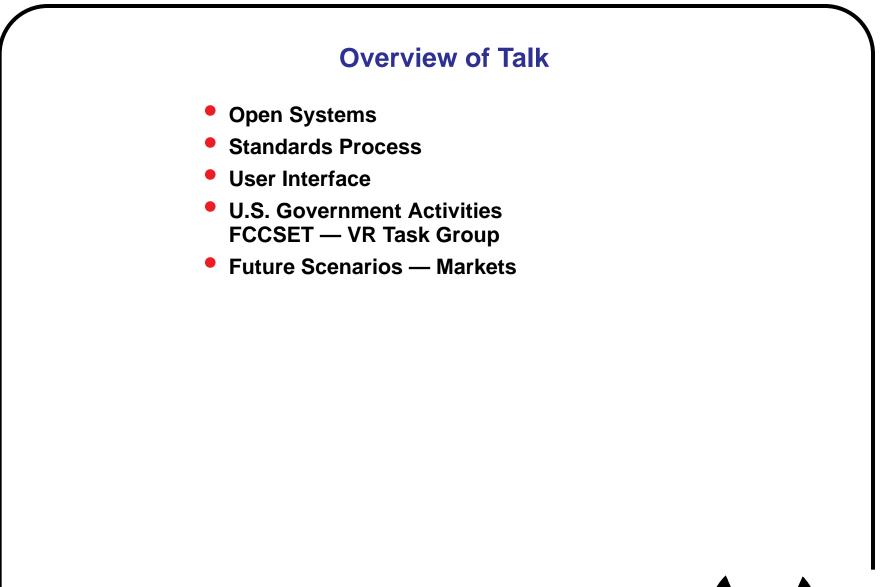R E A L I T Y
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# Open Systems

- **Framework for Interoperable Systems**
- **Heterogeneous Platforms**
- **Vendor Neutral**

# Open System Environment (OSE)

- **Extensibility**

  *Based upon an architectural framework which allows an extensible collection of interfaces, services, protocols, and supporting formats to be defined*

- **Non-Proprietary**

  *Interfaces, services, protocols, and supporting formats are defined in terms of nonproprietary specifications that are available to any vendor for use in developing commercial products.*

- **Consensus Based**

  *Evolution is controlled by a consensus - based process for decisions regarding definition and specification of interfaces, services, protocols, supporting formats, and other issues relating to the computing environment.*

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# Open System Environments — Benefits

- Increase freedom of choice in selecting vendors
- Reduce integration costs
- Protect software investment
- Enhance availability, quality and variety of complementary products

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# Profiles

- **A suite of specifications which reflect required functions and an organization's view.**

- **Application profiles should be expressed in terms of user-specified functions.**

- **A framework and taxonomy must be established to provide discipline to the process of describing user-specified functions.**

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# Application Portability Profile

- **Provides guidance to Federal agencies regarding selection and use of OSE specifications**

- **Is NOT a standard**

- **APP service areas provide the support necessary for a broad range of applications**

  *Operating System*
  *User Interface*
  *Data Management*
  *Data Interchange*
  *Programming*
  *Graphics*
  *Network*
  *Security*
  *System management*

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# User Interface

- **One service area of the APP.**

- **Oriented toward window system GUIs.**

- **Inadequate for the additional human interface devices commonly use in VR applications**
  *Head Mounted Display*
  *Spatial Sound*
  *Data Gloves*
  *3D Position Trackers*
  *Force feedback*

- **Beginning to explore the creation of a formal standard for 3D Position Trackers**

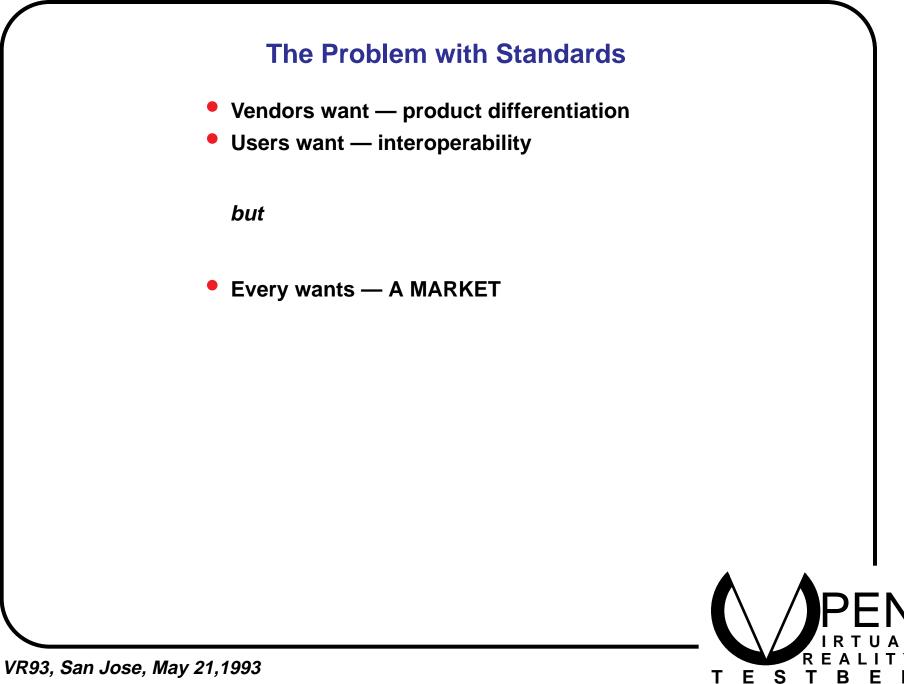*VR93, San Jose, May 21,1993*

# Formal Standards Development

- **International**
  *ISO/IEC, CCITT*
- **National**
  *ANSI*
- **Industry Driven / Open**
  *IEEE, ASME*
- **Government**
  *MIL-STDs*
  *FIPS*

*All are consensus building activities among diverse participants. This inevitably takes time.*

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# The Problem with Standards

- **Vendors want — product differentiation**
- **Users want — interoperability**

*but*

- **Every wants — A MARKET**

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# FCCSET — HPCC VR Task Group

- **Monthly meetings with representatives of many government agencies:**

- **Part of the HPCC, High Performance Computing and Communications FCCSET.**

- **Identify barriers to the productive exploitation of VR technologies.**

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# VR Application Domains

- **Health Care**

  *Shift delivery toward the patient*
  *Collaborative consultation*
  *Intervention planning tool*

- **Education and Lifelong Learning**

  *Explore virtual worlds — hazardous, inaccessible, team experiences, historical recreations, remote exploration*
  *Augmented reality*
  *Science and Math education - visualization and manipulation of abstract concepts.*
  *Natural access to digital libraries*

- **Manufacturing**

  *Collaborative design*
  *Rapid Interactive Prototyping*
  *Walkthroughs*
  *Virtual Factory*

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# Open Virtual Reality Testbed — Mission

*To facilitate the development of standard interfaces, and testing methodologies to the many novel human interface devices which when integrated for a virtual reality system.*

*NIST will work with a number of private companies, universities and other government agencies to ensure a broad base of functionality and acceptance to evolving standards.*

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# Open Virtual Reality Testbed — Current Activities

- **Signed Memorandum of Agreement with Army Research Institute - to provide facilities and expertise in the study of cognitive issues for VR.**

- **Participant in the VR Task Group of the HPCC FCCSET committee meetings.**

- **In the process of developing a Cooperative Research and Development Agreement with Silicon Graphics to explore long term strategic issues relating to VR.**

- **Initiating the development of a formal standards effort for 3D motion tracking devices, to be led by industry.**

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# Future Scenarios — Markets

- Is there a VR market?

- Where are the off-the-shelf products?

- Cost to develop applications is too high.

- Standards can reduce risk, broaden user acceptance, and increase potential market.

- VR technologies are still developing, many are premature

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# Standards and Markets

- **Do Standards create Markets?**

- **Do Markets demand Standards?**

- **Vendor community must be willing to put forward the resources required to develop standards.**

  *but*

- **That will only happen if there is the perception of a marketplace.**

- **Federal government can function as a facilitator and stimulus to the development of standards**

  *but*

- **Rarely develops standards on its own.**

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# Summary

- **Standards and Technology are a chicken and egg problem**

- **Valuble to identify specific technologies suitable for standardization.**

- **Standards lower the risk of software development.**

- **Applications must drive the technology.**

- **Government can play a role as a neutral facilitator.**