

Towards A Ubiquitous Future Limited Only By Our Imagination ...

Dipl.-Ing. Heinz Strauss

**Executive Architect
Chief Vision Officer, Germany**

Sun Microsystem GmbH

Geneva, April 7th, 2005



Technologies for Ubiquitous Networks

Devices

Ultra-small One-Chip Computers, RFID, Sensors, Smart Things

Infrastructure

High Performance Computing, 3G-2-4G, ISO Standards

Network

IPv6, Security, Seamless Network, QoS over Heterogeneous Networks, Sensor Networks

Appliances

New PDA's for Ubiquitous Environments, Digital Home Appliances, Wearable Computers

*Contents,
Services*

Personalized Services, Content Distribution, Streaming Data Distribution, Digital Rights Management

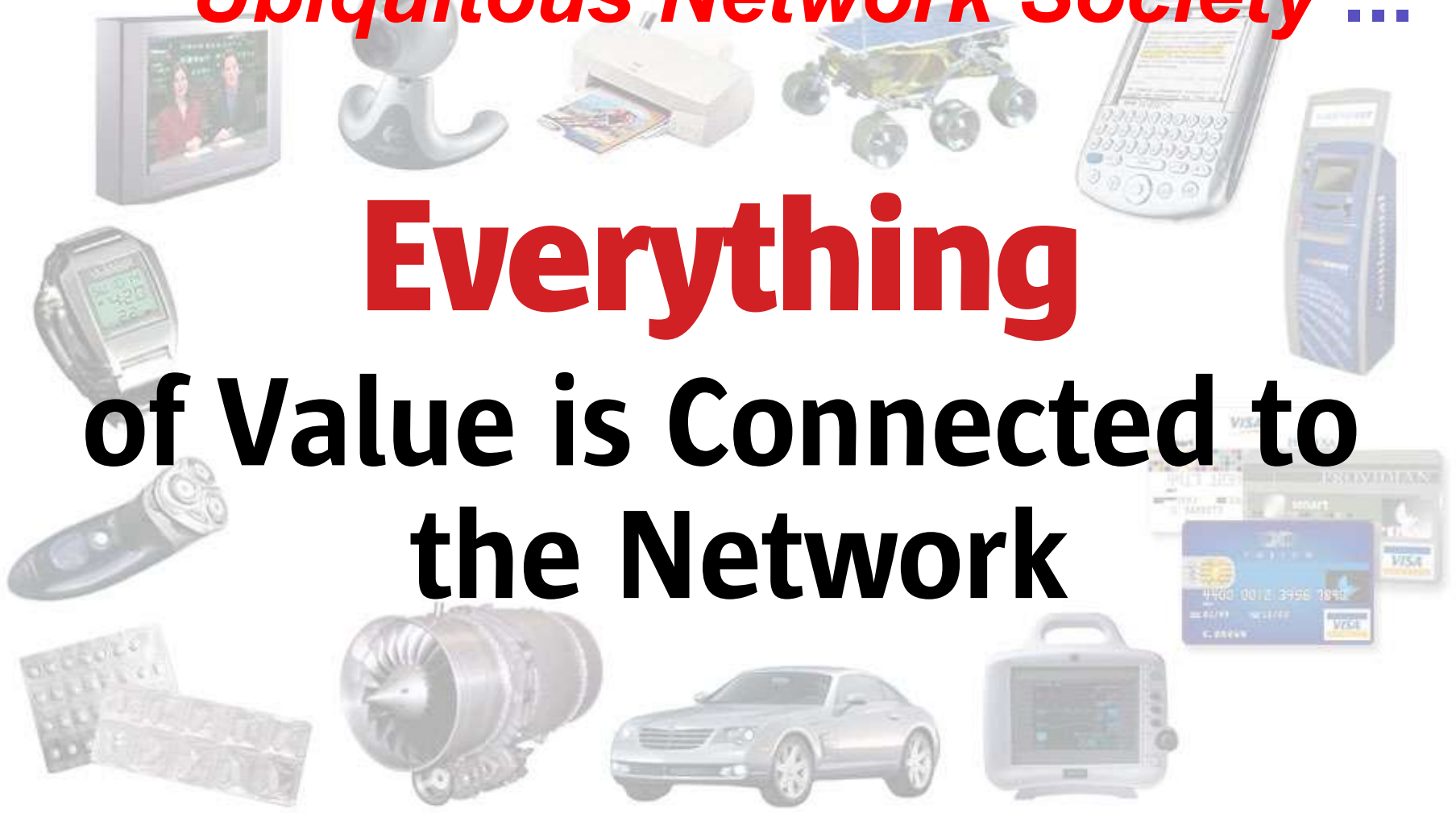
Impacts

Ubiquitous Society, Mobility vs. Ubiquity, Business Models, Government Regulations

The Vision of *Ubiquitous Network Society* ...

Everything

of Value is Connected to the Network



The *Vision Statement* of Sun Microsystems ...

Everything

of Value is Connected to the Network

Physical
Mobility & Service
Mobility

AUGMENTED REALITY: A NEW WAY OF SEEING

Computer scientists are developing systems that can enhance and enrich a user's view of the world

By *Jeffrey R. Feiner*

Marc Weiser's Vision of Ubiquitous Computing (1988):

- Desktop computer replaced with embedded computing devices in physical objects
- Small and invisible
- Enhance original functionality of physical objects
- Focus on the service, not on the computer

Local #23
NEXT BUS
30 Seconds

Express #45
NEXT BUS
7.5 Minutes

BUS STOP

WebTV
Product Review

★ FEATURES ★
★ 2000 HOURS ★
★ 2000 HOURS ★
★ 2000 HOURS ★

SEEK EASY AVAILABLE CONTACT
Metropolis Realty
Alliance Commercial Tech

Today's Specials
Sea Bass & Filet Mignon
★★★★

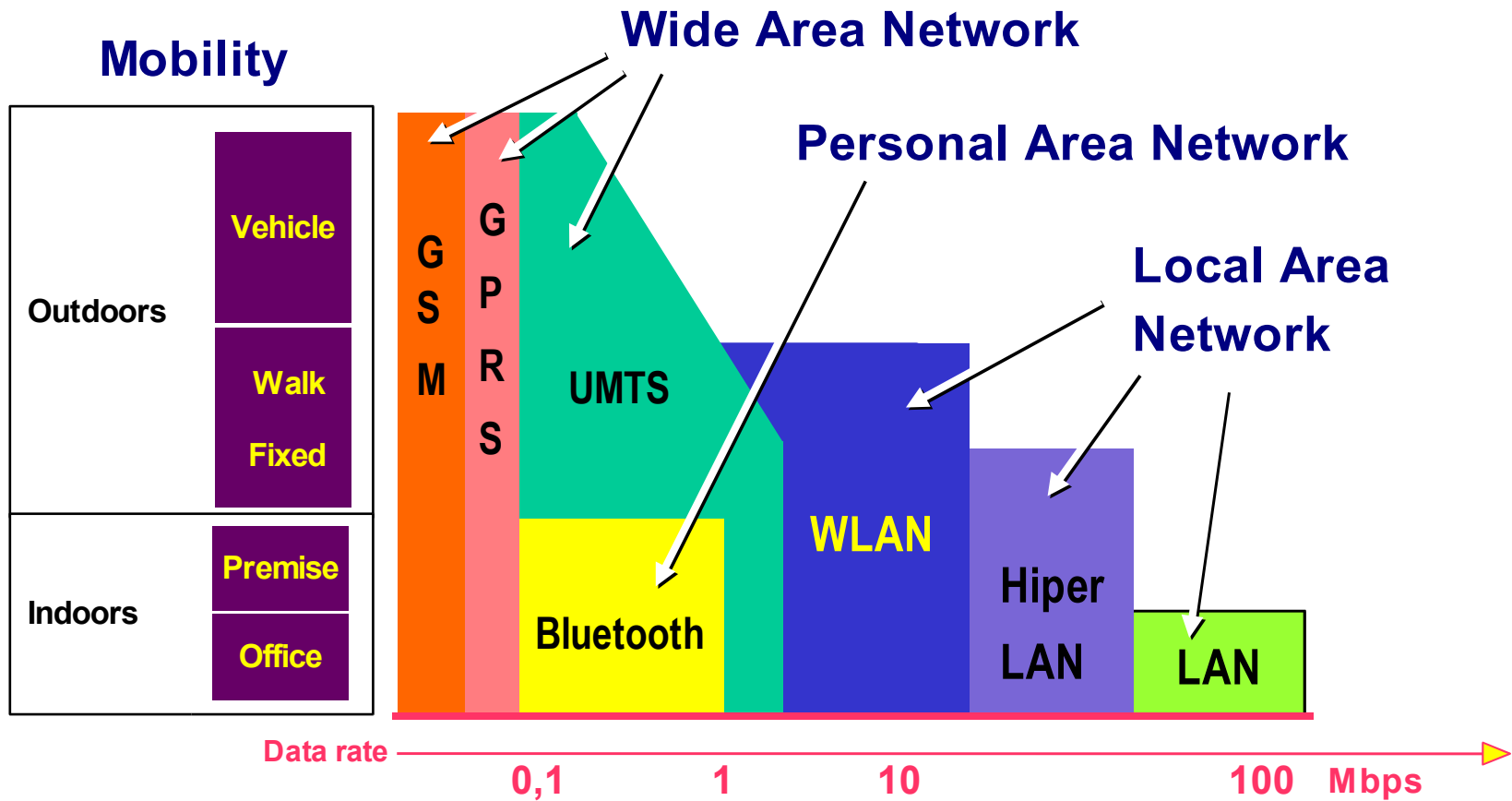
Route to
Mr. Christie's Office
ETA 12.5 Minutes

Incoming Call ... 212-555-2012 | Alpert, Bell & Clemens Brokers!

USE WEBSITE CAPABILITY to enhance the overall experience of an important mobile system that will be used by thousands of users. Through sophisticated graphics and text, this information (for example, when a subscriber's battery is low) can be displayed in a clear and concise manner (for more info and the user interface).

“ What are the Limitations ... ”

Technology Limitations - *Connectivity ?*



Technology Limitations - *Compute Service ?*

- **Storage Capacity**

- 80 Gbyte/sq.inch = 80,000,000,000 byte/inch
- 80,000 pocket books of 300 pages on 1 square inch

- **Telecommunications Speed**

- Optical cables: 5.2 terabits/sec
 - 600,000 pocket books of 300 pages in 1 second
- Wireless UMTS: 2,048,000 bits/sec
 - 0.25 pocket books of 300 pages in 1 second

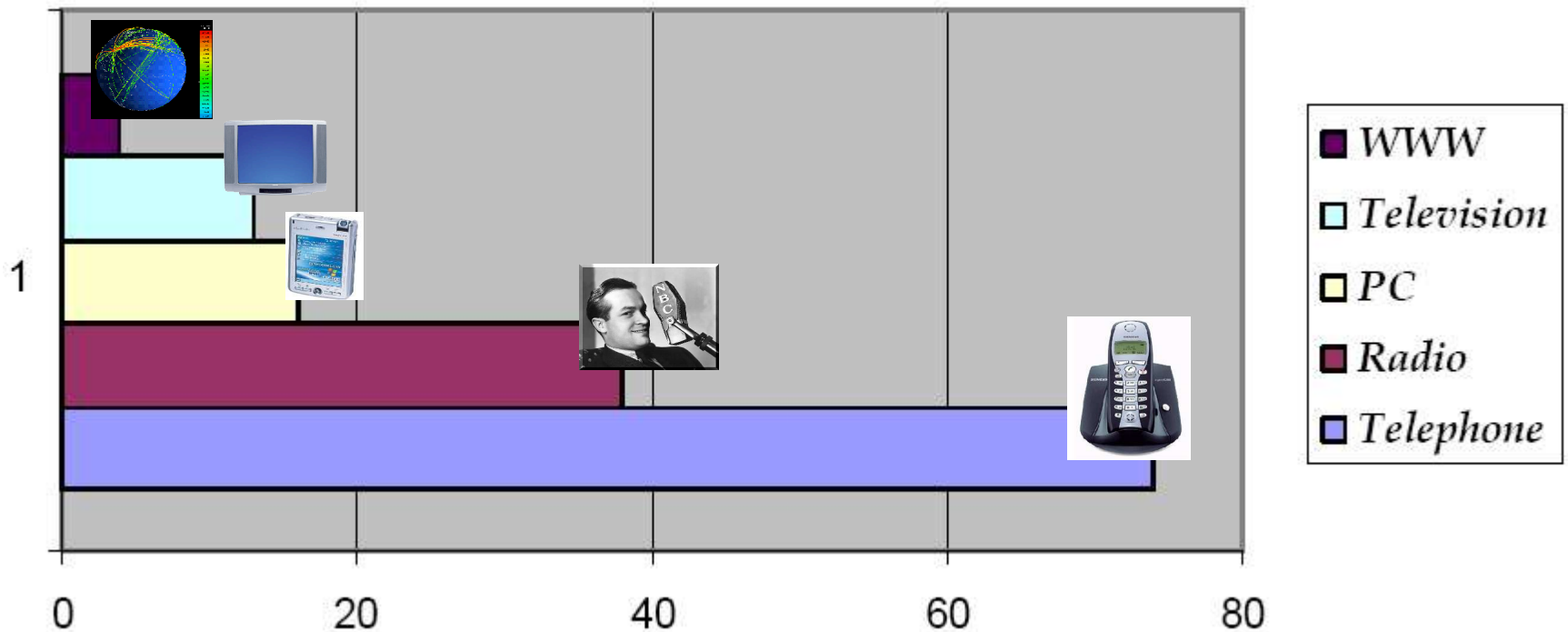
- **IP Addressing**

- 340,282,366,920,938,463,463,374,607,431,786,211,456

- **Processing Power**

Technology Limitations - *Adaption ?*

Years it took to reach 50 million users



Source: International Herald Tribune

Technology IS there...

- **Broadband & Wireless LAN**
- **Integrated IP-Network**
- **Enabling Technologies like AutoID / RFID chips in objects**
- **Things that embed a computer**



The Society ... ?

Taylor on His Way Out

- Individual HAS got Value
- Knowledge Society
- Talent, Knowledge
- Communication
- Organizing Talents
- Information, Experiance, Network



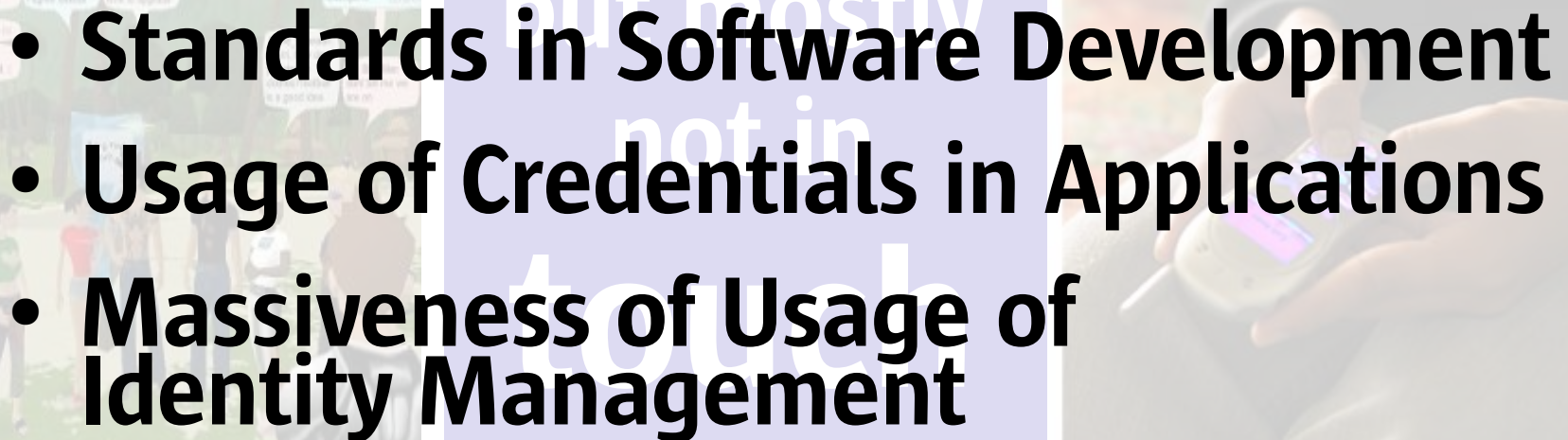
We are connected ...



but mostly
not in
touch



Break Limitations through ...

- 
- **Standards in Software Development**
 - **Usage of Credentials in Applications**
 - **Massiveness of Usage of Identity Management**

Identity Management & Gaming

- **Strategical & tactical Potential**
- **e-Learning – individual Senses (visual, audio)**
- **Alias, 680 MB zip**
- **Knowledge is Power**
- **“Valuable Business Simulation”**



“The Explosion on the Edge” - *The Needs of Standardization.*



- **Standardization in Software Development**
- **Credentials in ubiquitous computing applications**
- **Wide usage of Identity Management**

Trends in Software Development

1. Overloaded Operating Systems will Disappear
- 2. Components and Objects will step into the Foreground**
3. Mobile Code will Increase
- 4. Standardization of Distributed Systems**
- 5. Embedded Systems will Increase**
6. Wireless Network will be Accepted in Masses
7. Payment Models Changing

Source: Infosecurity TechTarget

“The Explosion on the Edge” -

The Needs of Standardization.

java.sun.com

J2ME.org

jini.org

jxta.org

jcp.org

projectliberty.org

signaturbuendnis.de



“The Explosion on the Edge” -

Die Explosion am Rande.

Synchronization of Business Rules

Data Center

Future
Application

Edge

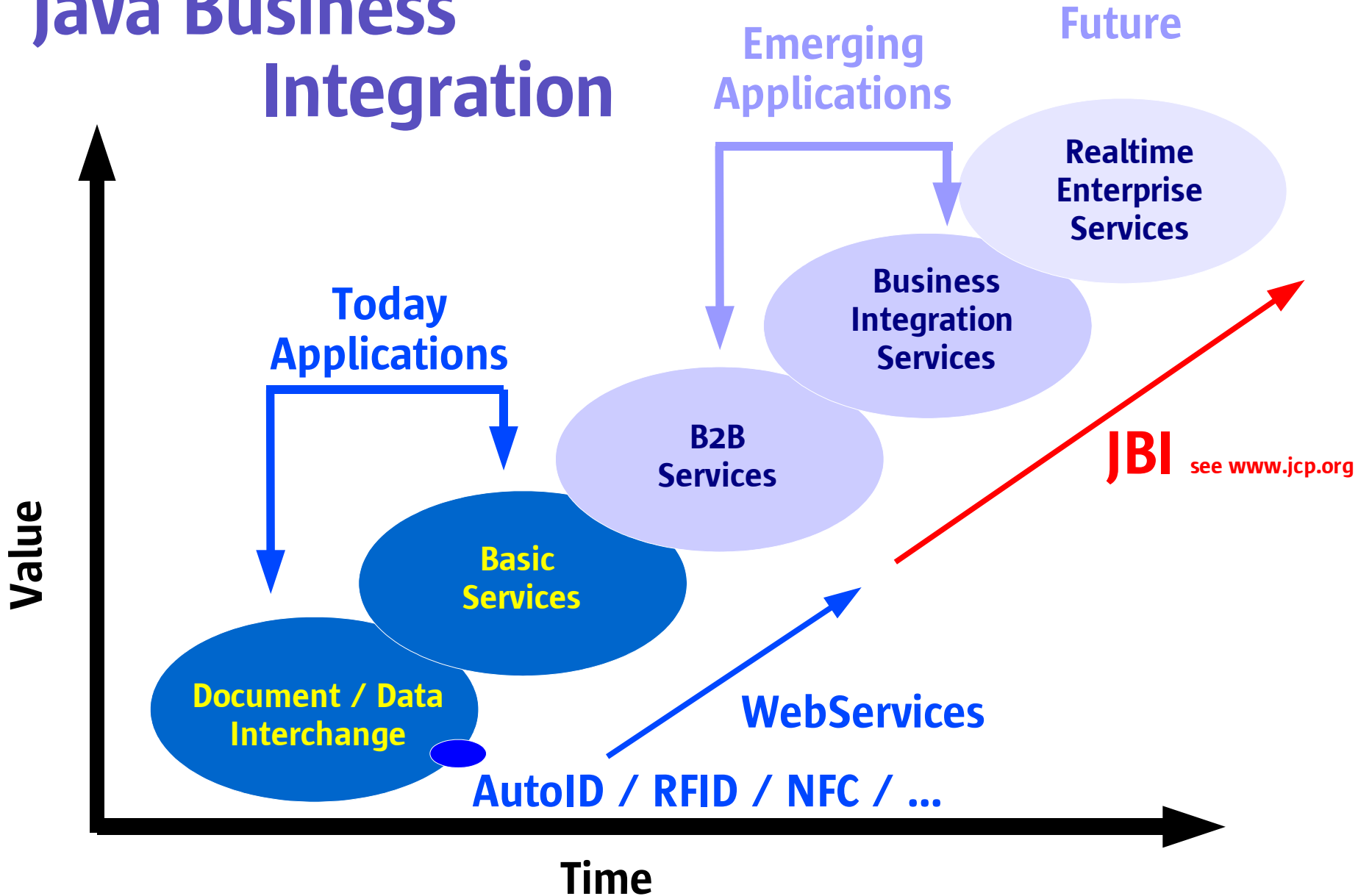
Transfer of Object Data

Today

Projects today

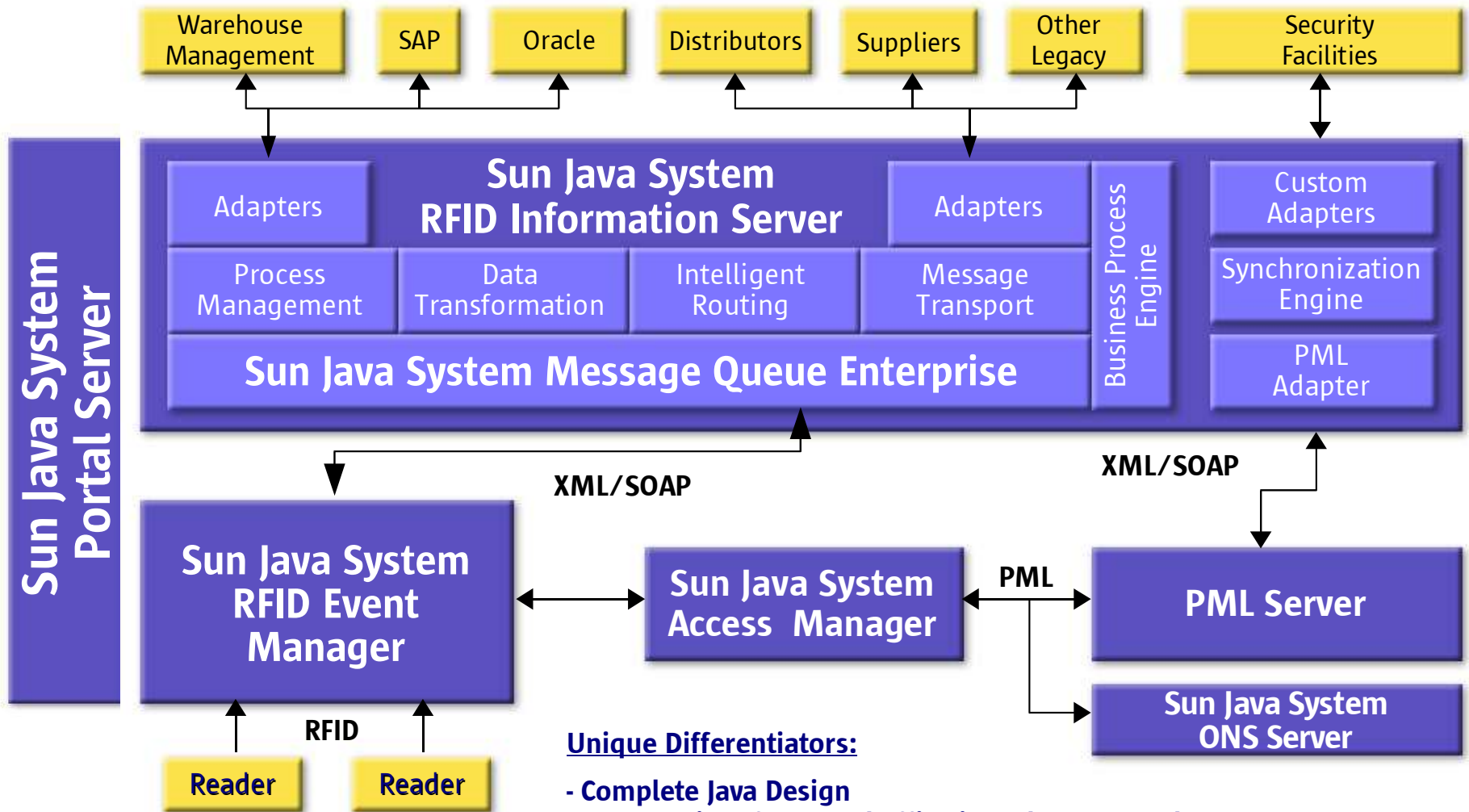


Java Business Integration



Questions ?

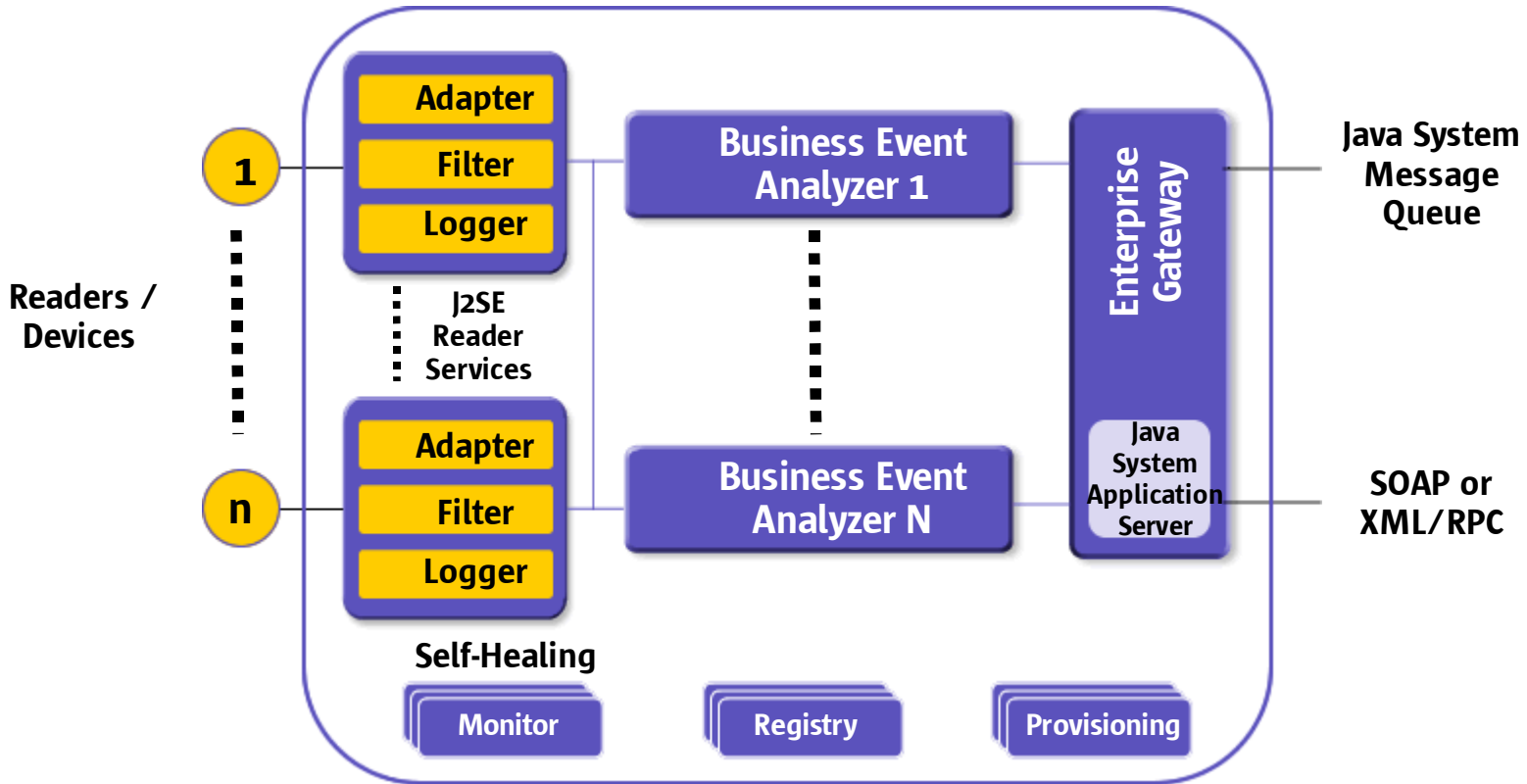
Sun's RFID Software Architecture



Unique Differentiators:

- Complete Java Design
- J2EE Services from Backoffice into the RFIDReaders

Sun's RFID Event Manager Architecture



Unique Differentiators:

- Complete Java Design
- J2EE Services from Backoffice into the RFID Readers
- Self-Healing due to Jini and Rio Architecture

Towards A Ubiquitous Future Limited Only By Our Imagination ...

Dipl.-Ing. Heinz Strauss

**Executive Architect
Chief Vision Officer, Germany**

Sun Microsystem GmbH

Geneva, April 7th, 2005



Rijks Museum, Amsterdam

Deepening of Understanding

Mobile

Floor Plan

Games

Self-motivation

Object information

Creativity



Sensor Networks

- **Cars as Dynamic Nodes of Network**
- **Speed, Position, Breaking, etc.**
- **Members of Swarm**
- **Share Information in Segment**
- **Bank of Fog**

