Multimedia Systems
ECE 624

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Distributed Multimedia Application Areas

- Healthcares/Hospital/Medical Information Systems
- Entertainment (Video-on-Demand, Home Video Distribution, Interactive Video Games)
- Engineering CAD/CAM, Photos and Manual Management, Distributed Manufacturing
- Industrial Control, Command and Control, Management and Monitoring
- Education / Training / Distance Learning / Digital Libraries/Museums
- Financial/Insurance and Law Firms
- Geographical Information System
- Office Automation/Management
- Tourism
- Interactive Advertising / Catalog Browsing
- Electronic Publishing
- Electronic Commerce

Advantages:
- Information-Rich Contents
- Cost Effective Document Management
The Promise of DMS

- Entertainment
- Health Care
- Tourism
- Defense
- Manufacturing
- Distant Learning
- Teleshopping
Multimedia Information Services

• Workgroup Application Services
  – SameTime, SamePlace: Group Scheduling, Groupware, etc.
  – SameTime, AnyPlace: Conferencing, etc.
  – AnyTime, SamePlace: Workflow, etc.
  – AnyTime, AnyPlace: Messaging, etc.

• Personal Application Services
  – Interactive
    • Retrieval: Web HTML retrieval, news-on-demand, movies-on-demand, etc.
    • Transaction: pay-by-view, teleshopping, interactive games, etc.
  – Distribution
    • Multicast: newspaper distribution, courseware-on-air, etc.
    • Broadcast: teleadvertising, data broadcasting, etc.
**Multimedia Workgroup Applications**

<table>
<thead>
<tr>
<th>SameTime, AnyPlace:</th>
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<tr>
<td>• Applications: Conferencing</td>
<td>• Applications: Messaging</td>
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<tr>
<td>• Examples: Fujitsu Desktop Conferencing</td>
<td>• Examples: FirstClass (SoftArc)</td>
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<td>• Examples: Meeting Maker XP (On Technology).</td>
<td>• Examples: Notes (Lotus), LinkWorks (Digital)</td>
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Fully document-integrated workgroup applications should support
- Truly multimedia document sharing and communication among working groups
- Fully access to documents at component levels from document management systems for workgroup activities such as sending out messages with retrieved documents or workflowing documents into right persons, etc.
Training and Education

• Classroom with multimedia materials
• On-line education and virtual classrooms
• Computer-based training coursewares (self-pace or on-demand)
• Distance learning with multimedia course materials
• Workflow teaching and learning systems with help, reference and feedbacks
• Typical users: corporate training and education centers, schools, etc.,
Record Management

- Tax, insurance claims, legal or financial transaction records
- Document images to replace papers, or microfiles
- Offices in multiple remote sites
- Search information across multiple departments
- Typical industries: financials, insurances, law firms, healthcares
Customer Services

• Publish and distribute technical manuals, repair manuals, product catalogs, etc., to customers
• Distribute in hardcopies, CD-ROM, or information servers
• Integrated with technical service support
• Use workgroup tools such as document workflow, conferencing, etc. for better service support
• Use multimedia for better communication between service centers and customers
• Typical users: product service departments, help desks, or call centers, etc.
## Multimedia Messaging

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<th>Characteristics</th>
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<td>Attached Files</td>
<td>+ Associated files with e-mail</td>
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<td>+ Filtering messages, forwarding deleting use less information, or setting up</td>
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## Multimedia Conferencing

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Manufacturing & Process Control

- Manage blueprints, engineering drawings and P & I Diagrams
- Organize highly cross-referencing engineering documents
- Create documents for a family of related products
- Exchange product data among vendors
- On-line help manuals and monitoring
- Typical industries: ATA-2100 (Air Transport Association/Aerospace Industries Associations), SAE J2008 (Automotive) and Pinnacles Group (Semiconductor), CALS/IETM(US. Military), process control, etc.
Distributed manufacturing

Concurrent Engineering using Computer Supported Collaborative Work

Distributed Locations but Shared Data and Knowledge:

- Designers
- Manufacturers
- Testers
- Sales

Product Design, Manufacturing and Testing Data/Knowledgbase
Example of a Browsing Graph
Health Care/Medical Information Systems

• Patient information management
• More than 50% hospitals are on the Internet
• Many states with large rural areas have deployed networks for telemedicine to provide remote health care delivery
• Picture Archival Communication Systems (PACS) is a commercial product available for radiological data (X-rays, CAT scans, MRI)

Notes
• In the area of health care delivery the use of telecommunication access to patient’s information by physicians and authorized users can save more than $32 billion annually.
• The use of video-conferencing alone can save the annual cost of consultation contracts by almost $132 million.
• Additional $103 million could be saved for medical education and professional development using video-conferencing.
  • 1992 study conducted by Arthur D. Little Foundation.
Health Care/Medical Information Systems
The diastolic phase of the cardiac cycle is superimposed on the systolic phase in order to calculate the ejection fraction (the percentage of blood that leaves the heart with each beat). Areas of the heart that have had an injury, represent scar tissue and have impaired contraction, (hypokinesia). In this example, the anterior apical area has reduced motion due to a previous occlusion of the left anterior descending coronary artery.
Ever Changing DMS Environment
Emerging DMS Challenges: Mobile and Ad-Hoc Networked DMS

Network Management
Mobility Management
Application Management
Security Services

Mobility Ingredients

Pre-emptive Roaming
Peer-to-Peer
Load Balancing
Power Management
Security with mobility

QoS – Multimedia Data
Power Over Ethernet

The ultimate “Dick Tracy watch” that tells you anything you want to know, wherever you are.
Emerging DMS Challenges: Distributed Sensor Network and DMS

Applications and users can make critical decisions based on multi-modal data provided by sensors deployed in dynamically changing environments.