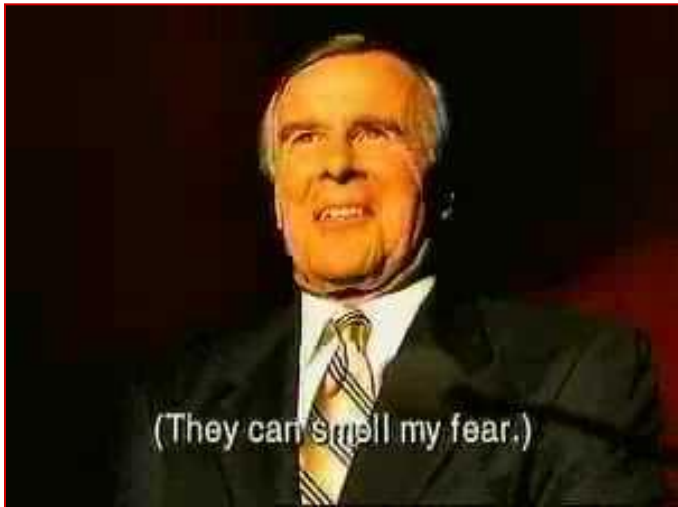
Using IT to Train IT

Jack M. Wilson
CEO UMassOnline.net

What happened to the world?

- **A few questions that I hope to answer:**
  - Why has your life been so crazy for last few years?
  - Why is your CEO feeling uneasy?
  - What is happening to the stock market?
  - What is the Internet Tsunami?
  - How can you survive it?
  - Why is UMassOnline part of the solution?



Changing the landscape of industry

Top 40 US-Traded Tech. Comp.			
	4/9/1999 Market Value ($B)		4/9/1999 Market Value ($B)
* Microsoft	469.7	* TSMC	32.1
Intel	204.8	* SAP	31.1
* Cisco Systems	189.7	* Amazon.com	30.1
IBM	167.5	EDS	26.1
* America Online	159.2	* Auto. Data Processing	25.9
* Lucent Tech.	158.6	Applied Materials	23.8
* Dell	105.8	* eBay Inc.	23.0
Nokia	80.4	* Tellabs	21.4
Hewlett-Packard	69.0	* Ascend Communications	20.6
* EMC	66.1	* At Home Corp.	20.3
* Sun Microsystems	53.2	* Computer Associates	18.9
Motorola	49.5	* First Data Corp.	18.2
Northern Telecom	49.0	* STMicroelectronics	16.1
Ericsson	45.5	* Micron Technology	11.3
Texas Instruments	42.1	* Priceline.com	11.1
* Compaq	40.9	* Gateway 2000	10.9
* Yahoo!	40.8	* E*Trade Group	10.8
Siemens	40.6	Computer Sciences Corp.	9.3
Xerox	39.0	* Linear Technology	8.7
* Oracle	37.8	* 3Com	7.8

* IPO since 1980

Source: Frank Quattrone
Credit Suisse First Boston

Changing Corporate Landscape

- **Would you rather be red than dead?**
  - Twenty seven (27) of the top 40 US Technology based companies are those that have done an IPO since 1980! (Shown in red)
  - Let's have a look at the Dow "Blue Chips"

What happened to the Blue Chips?

- **Yep, the 10 largest non-Dow stocks are larger than the 10 largest Dow Stocks!**

Dow Largest	Market Value	Founded	Non-Dow Largest	Market Value	Founded
GE	389	1892	Microsoft	483	1981
IBM	223	1911	Intel	269	1968
Wal-mart	211	1969	Cisco	220	1984
Exxon	195	1882	Lucent	202	1995
Merck	162	1934	Pfizer	154	1942
Citigroup	161	1968	AIG	153	1967
AT&T	159	1885	MCI WorldCom	146	1983
Coca-Cola	152	1919	Bristol Myers Squibb	145	1933
Johnson&Johnson	140	1887	Dell Computer	122	1987
Proctor&Gamble	133	1905	Bank of America	111	1968
	192.5			200.5	

Who is getting ahead?

- **5 richest Americans (in billions):**
-

1. Bill Gates III, Microsoft, $ 85 billion
2. Paul Allen, Microsoft, $ 40 billion
3. Warren Buffett, investor $31 billion
4. Steven Ballmer, Microsoft, $ 23 billion
5. Michael Dell, Dell Computer $ 20 billion

A New Paradigm

- **OLD Paradigm:**
  Physical Capital / Resources

- **NEW Paradigm:**
  Knowledge / Intellectual Capital

  – Frank P. Quattrone
  Managing Director
  Head of CSFB Technology Group
  Credit Suisse/First Boston

Learning: The Killer App

- **Is Learning the "Killer App" of the next generation of computing?**

Yes!

The Fact:

- It is the worlds best communication tool combined with what will be the
- World's Largest Library
  Creating the First and Only
- Global Continuous Learning Environment

Relentlessly changing the way we

- **Labor**
- **Live**
- **Love**

and

- **Learn**

Recipe for Economic Success

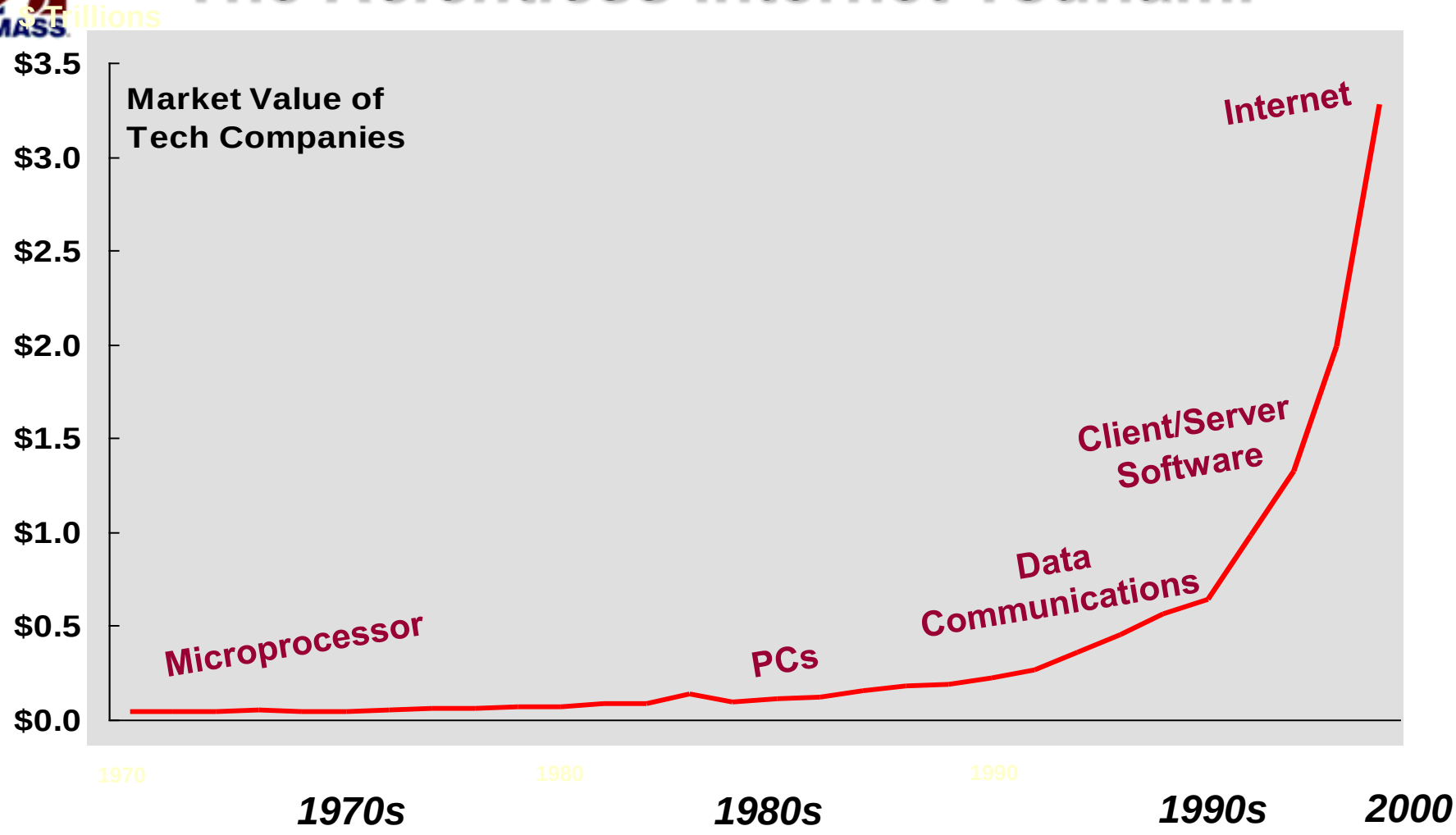
- **Outstanding Educational Institutions**
  - K-12
  - Community Colleges
  - Undergraduate Institutions
  - Research Universities
  - Continuous Education Opportunities

- **Financial Investment in Innovation**

- …. states' economic success will increasingly be determined by how effectively they can spur **technological innovation**, **entrepreneurship**, **education**, specialized skills, and the transition of all organizations -- public and private -- from **bureaucratic hierarchies** to **learning networks**.

-
  - Robert Atkinson et. al.; PPI

The *Relentless* Internet Tsunami



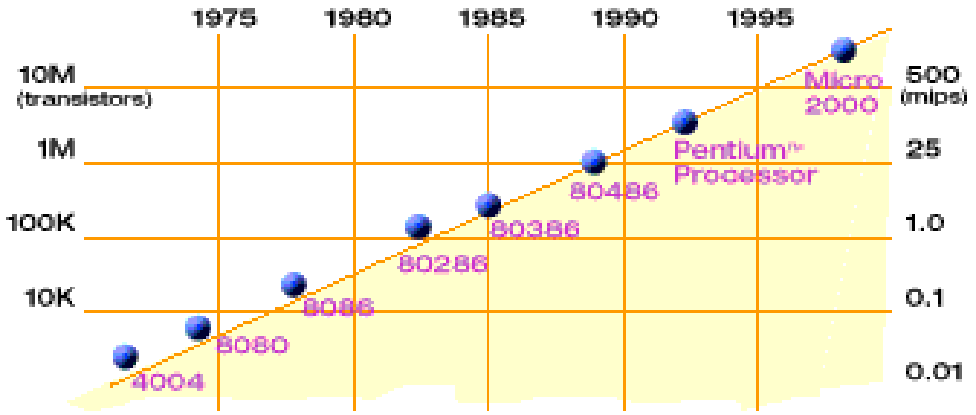
Incl. Int'l Tech Companies
Source: Securities Data Company

Size of the IT market

- **Information Technology (1999)**
  - $1,000,000,000,000 US
  - $3,000,000,000,000 WW
    - Paul Severino, September 24, 1999

Wilson's Favorite Laws!

- **Moore's Law:**
  - CPU performance doubles every 18 months



- **Bandwidth law:**
  - Bandwidth is doubling even faster!

- **Metcalf's Law:**
  - the value of a network scales as n^2 where n is the number of persons connected.

Internet Tsunami -what next?

- Consumer electronics companies, media giants, phone companies, computer companies, software firms, satellite builders, cell phone businesses, Internet service providers, television cable companies are aggressively investing to build out the Internet.
- Within the next five years, the vast majority of Americans should be able to interact with the Internet from their television sets, or watch television on their PCs, and make telephone calls from both devices

It ain't over till it's over

- **Moore's law, the Bandwidth Law, and Metcalf's law remain true and are expected to continue to be true for another 40 years at least!**

- **These will drive faster and faster need for change.**
  - Companies will have to respond.
  - Training is the only way!

- **It ain't over till the fat lady sings -and she isn't even in the hall yet!**
  - Jack M. Wilson: http://lallyschool.rpi.edu/Wilson/ITE.html

Producing IT Workers

- **US Produces 35,000 per year (1995)**
- **India Produces 55,000 per year**
- **US produced 50,000 computer graduates/ year in 1986!**
- **40% of Computer majors are foreign born.**
  - Carol D'Amico, Hudson Institute in "Understanding the Digital Economy"
    - (Commerce) http://www.digitaleconomy.gov/

CITI

- Commonwealth Information Technology Initiative
- Focused on supporting workforce needs across Massachusetts
- Involves UMass, State Universities, and Community Colleges

Where will you get your IT workers?

- **Is IT critical to your company's future in some way?**
- **The "build versus buy" decision**
  - Buy: Compete in the hot job market
    - new graduates and experienced IT professionals
    - need for targeted training for new hires
  - Build: Grow your own through training
    - upgrading existing IT professionals
    - cross training non IT personnel into IT
- **Pace of changes means that workers need to be "built" or "bought" continuously!**

Reasons for IT Training

- **Introduction of new technologies in the workplace requires retraining.**
  - Windows, Office, ERP, Customer Relationship Management (CRM), eCommerce, eBusiness, Help Desk, etc.
- **Technical change obsoletes degrees rapidly**
- **Recruiting: Opportunities for further study or graduate degrees can help attract new employees.**
- **Retention: See above. Can achieve employee "lock-in."**
- **Retraining non-IT employees in IT areas.**
- **To gain an unfair competitive advantage in their industry!**

Why use IT to train IT?

- Conventional methods cost too much
- Conventional methods disrupt the workplace.
- Conventional methods disrupt employees' lives.
- Conventional methods do not provide the continuous reinforcement required.
- This training is mission critical
- Conventional methods are just too conventional!

The Changing Workforce

- **Information Technology Association of America (ITAA) finds**
  - a national IT workforce of **10.4 million**.
  - Add to this total an additional **900,000** workers that companies say they hope to hire this year.
  - Of this total, **425,000 positions will go unfilled** because of a lack of applicants with the requisite technical and non-technical skills.
- **In 2000 ITAA: 12-month demand for IT workers of 1.6 million and a shortfall in filling jobs of approximately 850,000.**
  - "When Can You Start?" Building Better Information Technology Skills and Careers; A Study Conducted by the Information Technology Association of America (ITAA) April 2001

Non IT Companies dominate

- **Non-IT companies remain the larger employer of IT workers with 9.5 million,**
- **generate the greater demand at over 640,000 and**
- **experience the larger gap at approximately 303,000.**
- **In aggregate terms, non-IT companies employ *ten times more IT workers* than do IT companies.**
- **Not a surprising result as this study finds a total of 305,835 non-IT companies in the U.S. with over 50 employees, compared to 13,842 IT companies with over 50 employees.**
- **This means 22 non-IT companies exist for every one IT company in the U.S.**
  - ITAA April 2001

The best ways for workers to acquire needed skills ?

- **Four-year college degrees proved the best pre-hire means of attaining needed skills and knowledge in four of eight job categories:**
  - database development/administration,
  - enterprise systems,
  - programming/software engineering and
  - technical writing.
- **Private technical schools pulled the highest marks for network design/administration and digital media.**
- **Certification remains a moderate priority**

Certification

- The certification by applicants through a vendor or industry certification program remains of moderate importance.
- Managers ranked vendor certifications as 3.4 (IT companies) and 3.1 (non-IT companies) on a five-point scale measuring importance.
- Industry certifications tallied slightly higher at 3.7 and 3.4, respectively.
- IT companies viewed certifications at least as important as a bachelor's degree;
- non-IT companies placed certifications slightly below a bachelor's degree in importance.

– ITAA April 2001

Retention

- **Non-IT companies appear to expect their IT workers to remain on staff an average of six months longer than their IT company counterparts.**
  - Average acceptable tenure for the former is 36 months versus 30 months for the latter.
  - Non-IT companies also appear to retain their IT employees longer, with 82 percent remaining on board an acceptable length of time versus 74 percent for IT company employees.
- **Continuous Education Opportunities are often seen as a key part of retention strategies.**

My Three Messages:

- **It's about intellectual capital stupid!**
- **Intellectual capital demands continuous development.**
  - (fish, relatives and intellectual capital spoil after three days.)
- **Computing, Communication, and Cognition will change the process tremendously.**

Training Industry

- **Training and Development is a**
  - $62 billion dollar industry in transition.
  - Corporate spending on Web training hit $600 million in less than five years,
  - expected to jump to $10 billion by 2002.

IT and Continuous Education

- **Using IT to train IT gives your organization the "unfair advantage" for**
  - Using IT to in business
  - attracting, retraining, and retaining the key IT workers that you need.

- **The world is moving very fast.**

- **"Don't look back, somethin' might be gaining on you!" -Satchel Paige, baseball great.**

The Boston Globe
Business

Jobless rate holds steady in Mass.

By Bruce Butterfield, Globe Staff, 5/19/2001

After rising in each of the first three months this year, the unemployment rate in Massachusetts held steady in April at 3.2 percent, state officials said yesterday, and the economy added a modest 1,300 jobs.

The state's employment numbers, while far from robust, were nonetheless encouraging and a contrast to the performance of the nation, which lost 223,000 jobs in April - the most in 10 years - and posted a 4.3 percent jobless rate.

Principles for Reinventing Workforce Development Strategies for the New Economy

1. Invest in Training, Rather Than Giving Firms Subsidies.
2. Leverage Employer Investments.
3. Encourage Firms to Become Learning Organizations.
4. Address Both Short-Term and Long-Term Skill Shortages.
5. Expand Learning Choices for Workers.
6. Demand Accountability.
7. Use Information Technology to Give People New Tools.
8. Be Customer-Focused.

----Progressive Policy Institute

The Forty Year Degree

- **Christopher Galvin, President Motorola:**
- **We are not hiring any more graduates with four year degrees.**
- **We want employees with forty year degrees**

Why we are running so hard?

- **The Internet's pace of adoption eclipses all other technologies that preceded it.**
  - Radio was in existence 38 years before 50 million people tuned in;
  - TV took 13 years to reach that benchmark.
  - The Internet crossed that line in 4 years, once it was opened to the general public.

- **Internet Time**
  - 1 internet year = 2 dog years = 14 people years

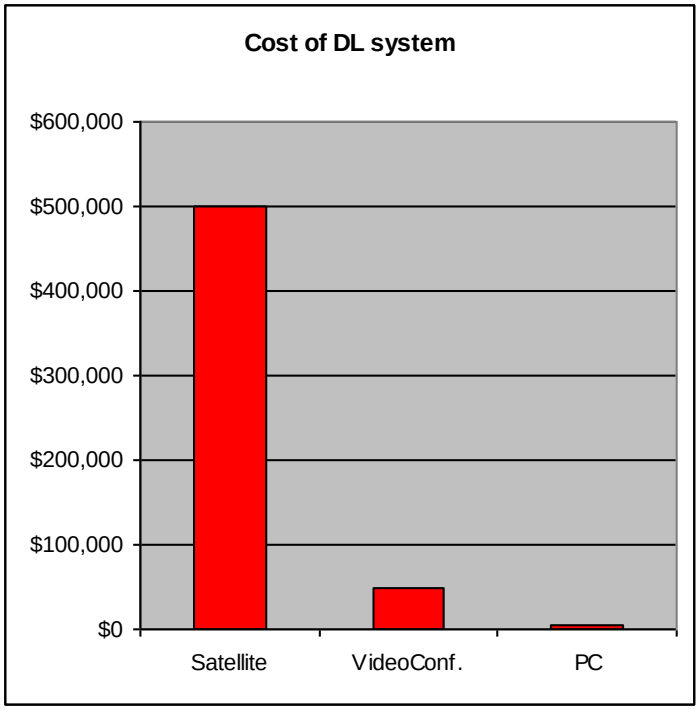
The horrible mismatch

- People change very slowly
- Technology changes very rapidly

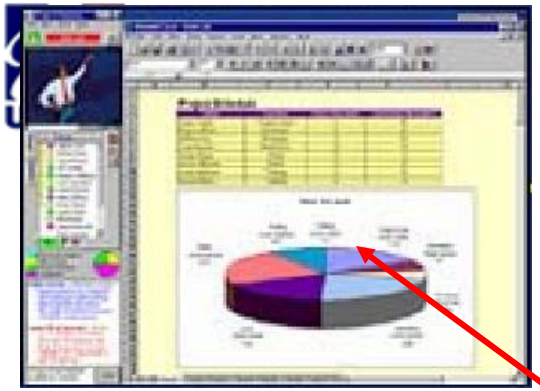
The Puzzling Paradox

- Never has there been a larger need for learning
- Never has there been less time to do it!

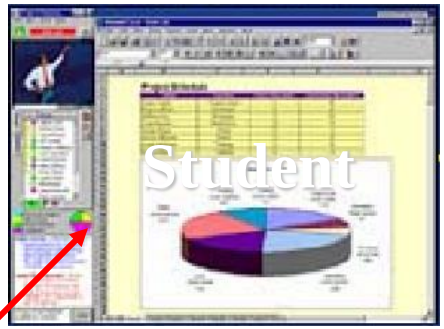
Distance Learning Technologies

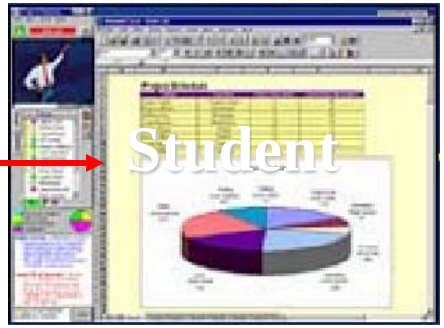


- **Satellite Video ($500,000)**
- **ISDN Videoconferencing ($50,000)**
- **PC Collaborative ($5,000)**
- **Web Based Asynchronous ($5,000)**

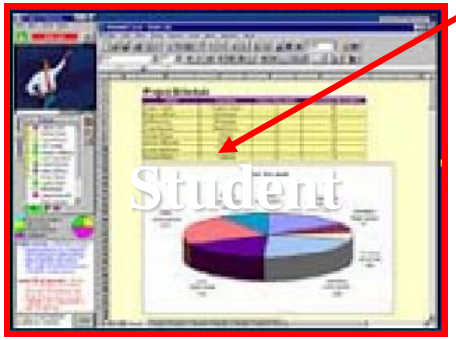


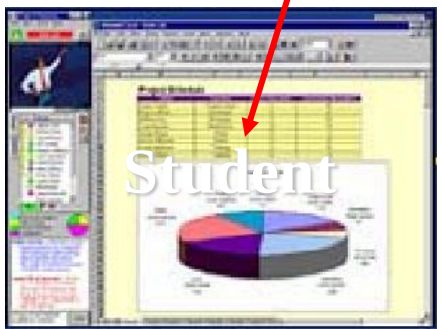
Instructor

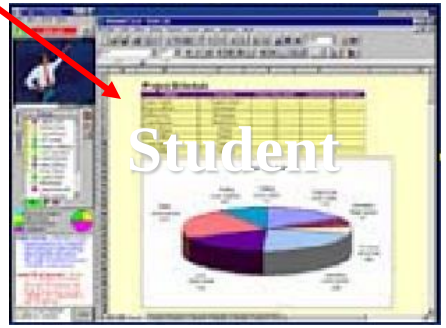




The Internet
Voice & Data

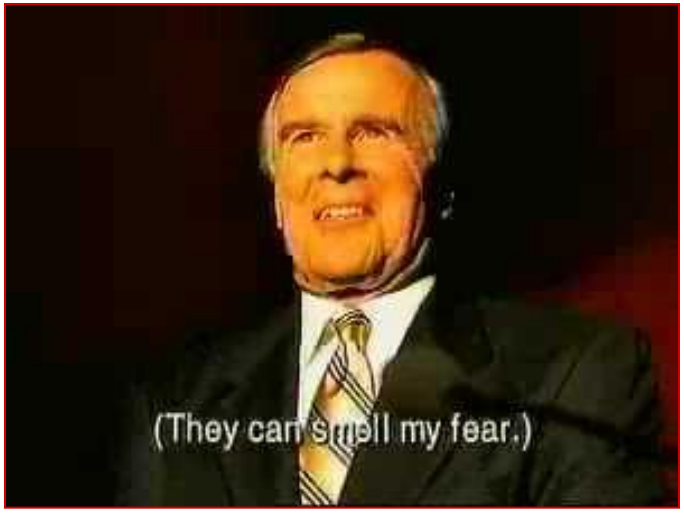


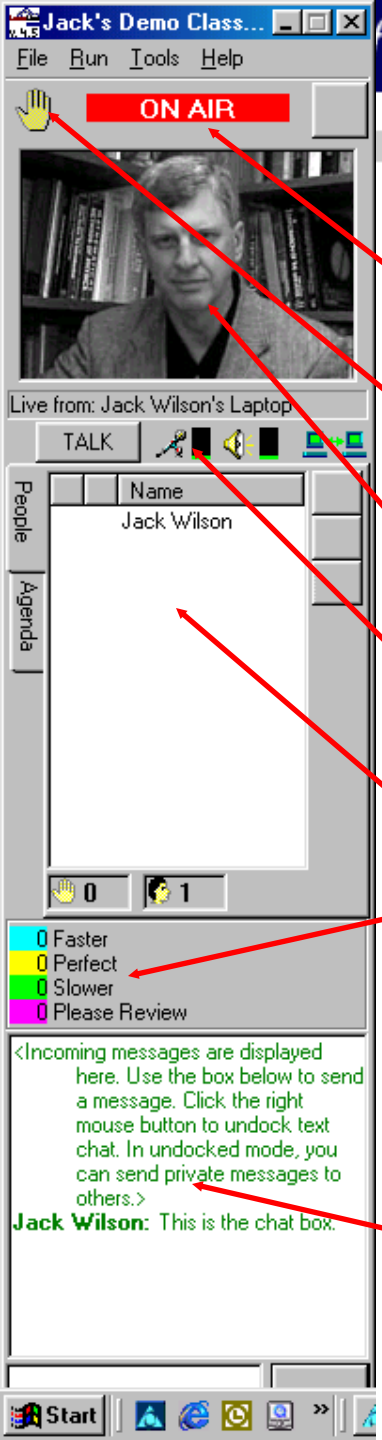




Introduction to eBusiness

- **Fall 2000:**
  - Tuesday night from 6:30-8:30 pm
  - 50 On Campus Students
  - 75 Off Campus Students
    - IBM, Ford, GE, Lockheed Martin, Pratt and Whitney, Ford, Consolidated Edison, NY Power, J. P. Morgan, Carrier, Otis, etc.
  - Extensive Website:
    - http://www.jackmwilson.com/eBusiness/Syllabus-Spring2001/
  - MBA, MSIT, MS
  - miniLectures, Discussion, Student presented cases, & asynchronous interactions
- **Spring 2001:**
  - 75 overflow students (25 on and 50 off)





- On- Air indicator
- Raise your hand
- Picture or video of speaker
- Audio and Network controls
- Agenda or class roll
- Feedback section
  - (can be pace, agreement, T/F, Yes/No, etc.)
- Chat Window

In flight repairs

NTU-Rensselaer Course

- **"Hands On World Wide Web"**
- **Feb. 10 & 17, 1998**
- **8000 participants**
- **500 sites**
- **Most successful NTU course ever**
- **"The future of satellite based education."**
  - Lionel Baldwin, President, NTU
- **Certainly the largest!**

UMassOnline.net

- **Built upon the successes of the 5 campuses.**
- **Is already the largest on-line university in New England**
  - Over 5000 students
- **Portal: www.UMassOnline.net**
  - Launched in February
- **Why Massachusetts?**
  - The most advanced of the information based economies.
  - Huge needs for talent –even in a downturn
  - Employee retention
  - Huge travel costs

Why UMassOnline?

- An **internationally recognized faculty**, including winners of the world's most prestigious awards, including the Pulitzer Prize, Nobel Prize, National Book Award for Poetry, and the Draper Award in Engineering.
- A **300,000 alumni(ae)** network, including successful, highly respected industry leaders, scientists, authors, astronauts, hi-tech entrepreneurs, and entertainers.
- A staff and faculty committed to meeting the needs of students, whether on campus or off.
- The University's reputation as a **world-class research institution**, consistently producing important research advances.

What have we done in the past?

- a leader in distance education for over 25 years.
- In 1975 we were among the first to send out videotaped engineering courses
- One of the seven founding members of National Technological University.
- We have been delivering education via the Web since 1995.

Update on Activities

- Platform selection is nearly complete
- Director of Marketing Search is nearly complete.
- Financial plan is under construction
- Council of Continuing Education Directors Created.

Masters

- **Professional MBA:**
  - Based at Amherst, but offered strictly offsite and on the web. Offsite locations include Westborough, BayState Medical Center and Berkshire Medical Center. The program is nearly fully online, and will be completed soon.
- **Masters of Public Health:**
  - Based at Amherst, but offered at the UMass Medical School in Worcester and online. The program is nearly fully online and will be completed soon.
- **M.S. (Nursing) Community/School Health:**
  - Based at Amherst and offered online. The program is now fully online.

Bachelors

- **BS in Information Systems:**
  - Lowell: one of the main reasons for the campus' rapid growth in online enrollment. The courses can also be taken towards an Associates in IS as well.
- **Bachelors of Liberal Arts:**
  - Lowell (in part funded by UMassOnline), aimed at degree completers and should be completely online by the end of this calendar year.
- **Bachelors in Hotel, Restaurant and Travel Admin.:**
  - Based at Amherst and in part funded by UMassOnline, the program has its first courses online this semester and should begin formally accepting degree seekers in the next year.
- **RN to BS:**
  - Based at Amherst, the program has just begun converting to online.

Certificates

- **Credit certificates based at Lowell (five):**
  - Fundamentals of Information Technology Certificate
  - Multimedia Applications Certificate
  - Intranet Development Certificate
  - Unix Programming Certificate
  - Data Telecommunications Certificate
- **Non-credit certificates (two):**
  - Online Communication Skills (Dartmouth -)
  - Fundamentals of Arts Management (Amherst -)

Certificates

- **UMassBoston - five on-line certificates**
  - technical writing,
  - communications,
  - computer science,
  - curriculum frameworks, and
  - corporate instructional technology.

Jeff Taylor

- **On the Need for UMassOnline**

Jack M. Wilson

http://www.UMassOnline.net

The End

Organizing the University

Herding Cats?

University of Massachusetts

Amherst Boston Dartmouth Lowell Worcester

UMassOnline.net

NORTEL NETWORKS™

monster.com®

Massachusetts High Technology Council

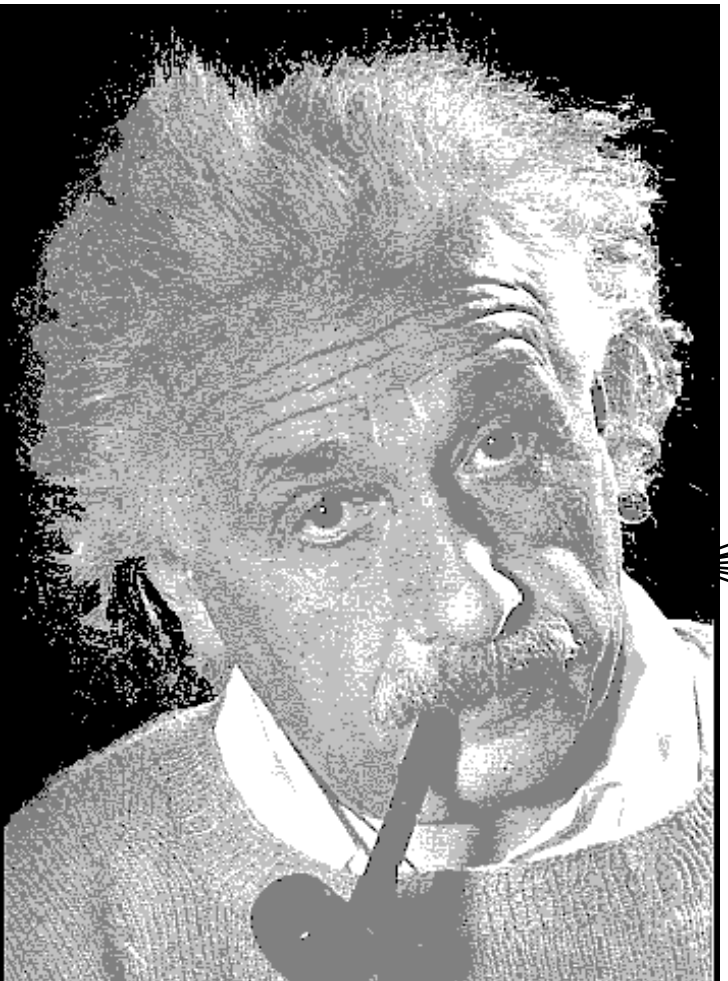
UMassOnline

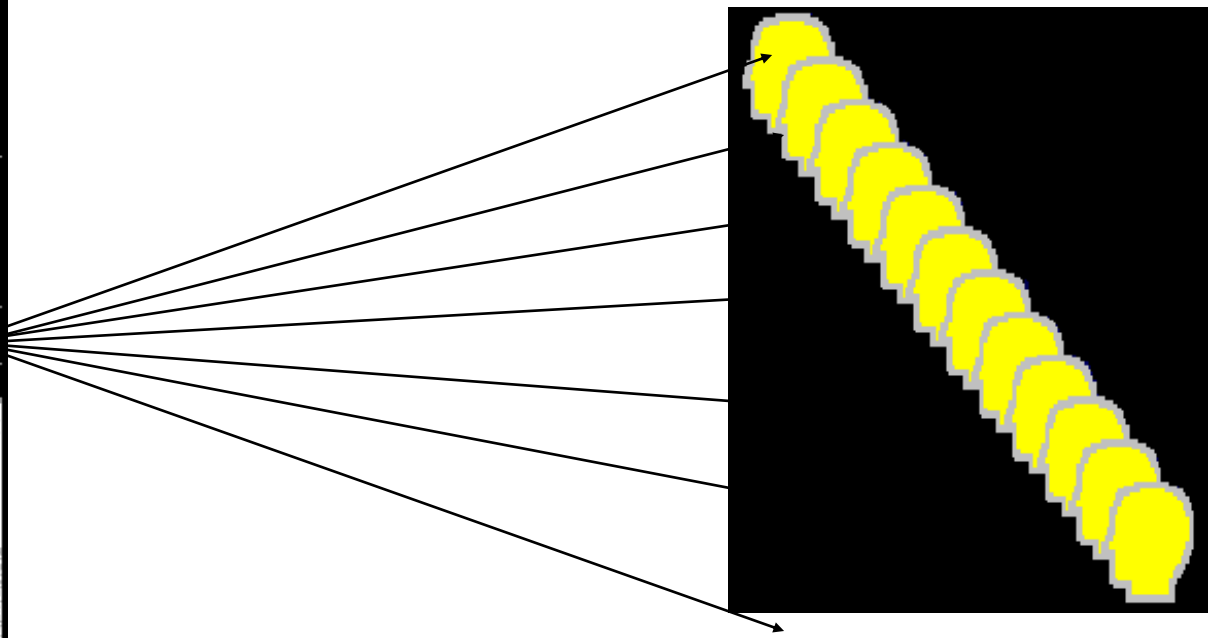
University *of* Massachusetts

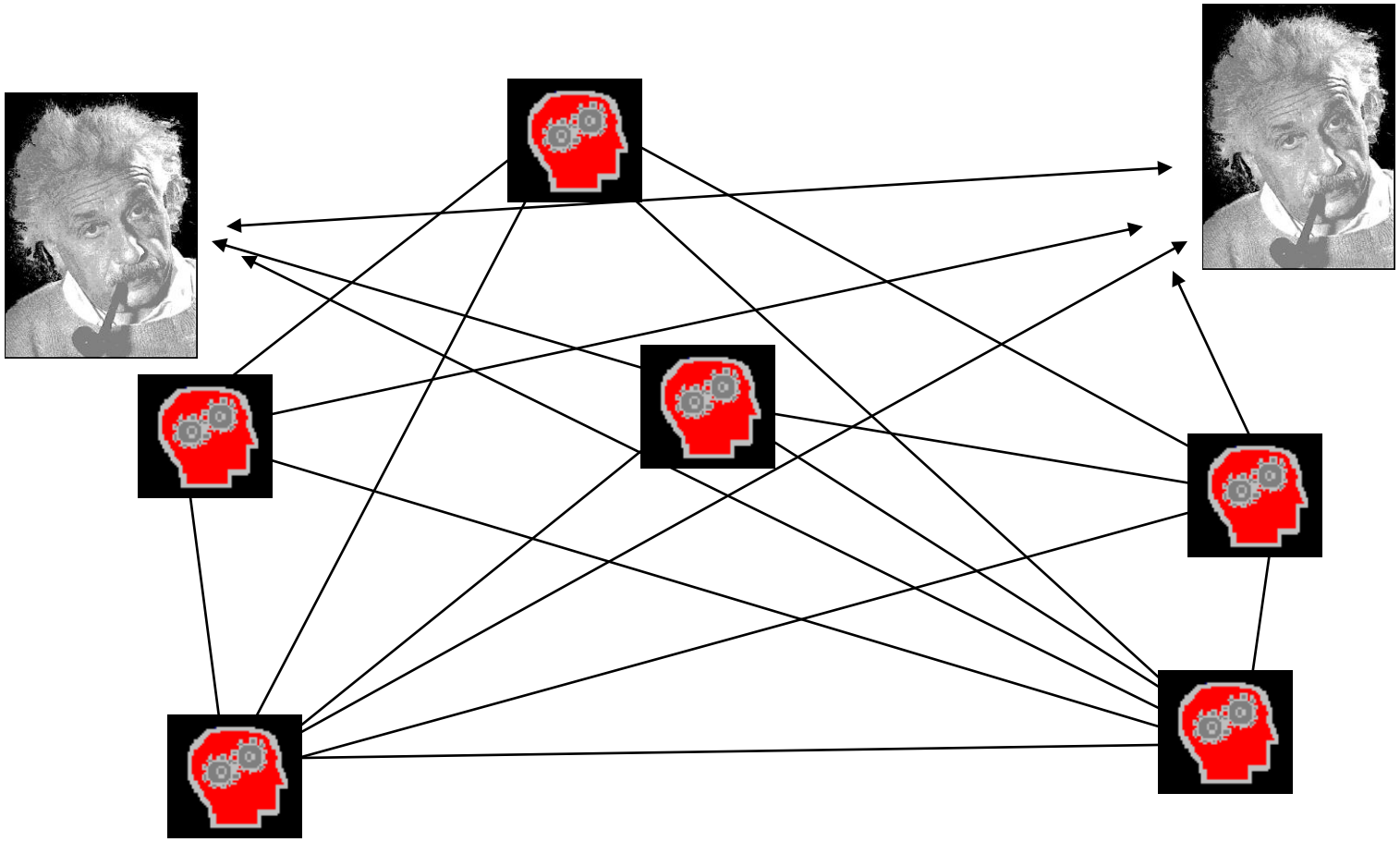
Amherst · Boston · Dartmouth · Lowell · Worcester

The transmission model

- The mainframe approach





Interactive Learning

- **Distributed Collaborative Model**