


History and Future of Digital Learning at the University of Arizona



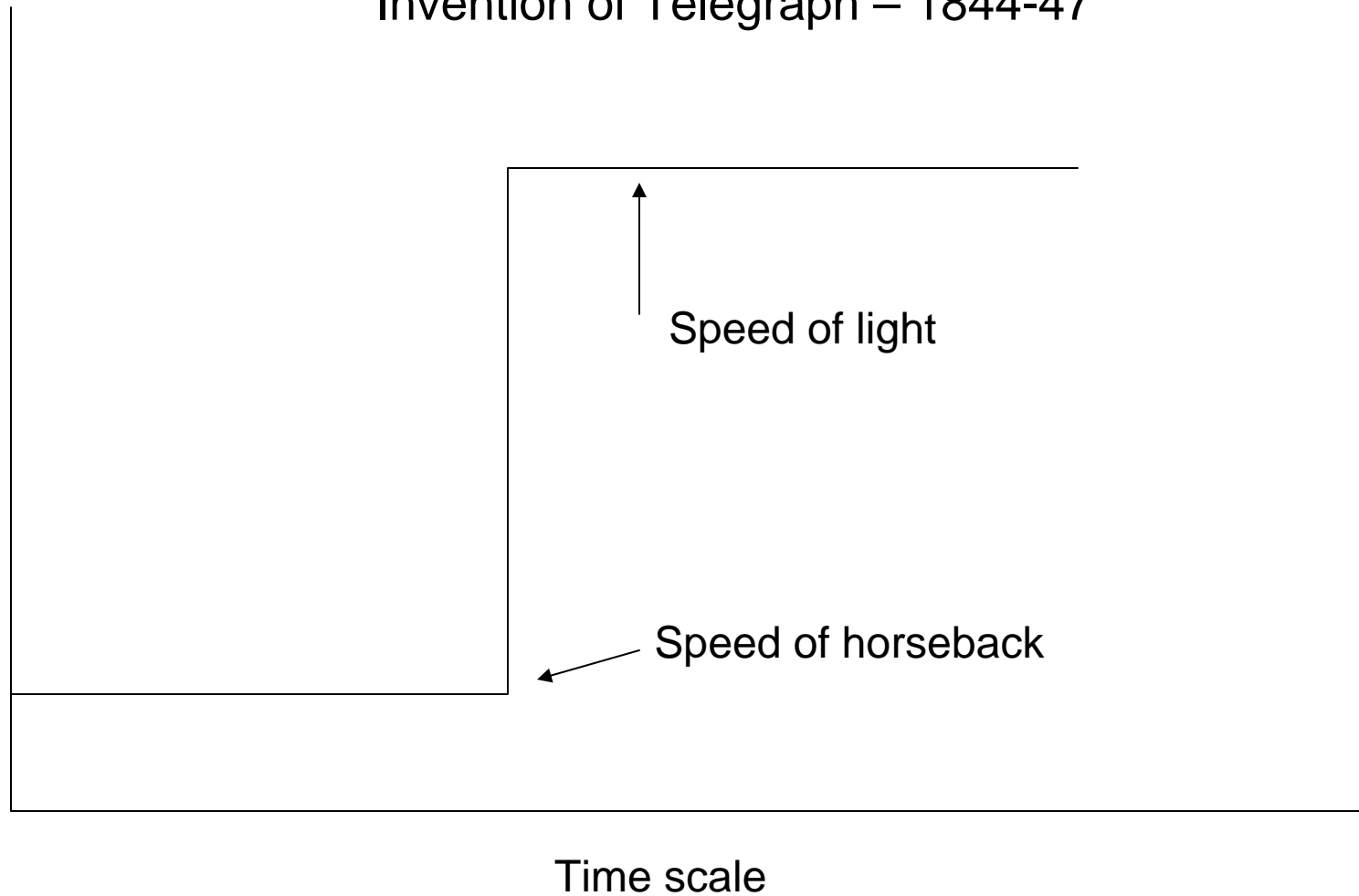
Roger L. Caldwell

Foundations for Transformation



Unanticipated Discontinuity

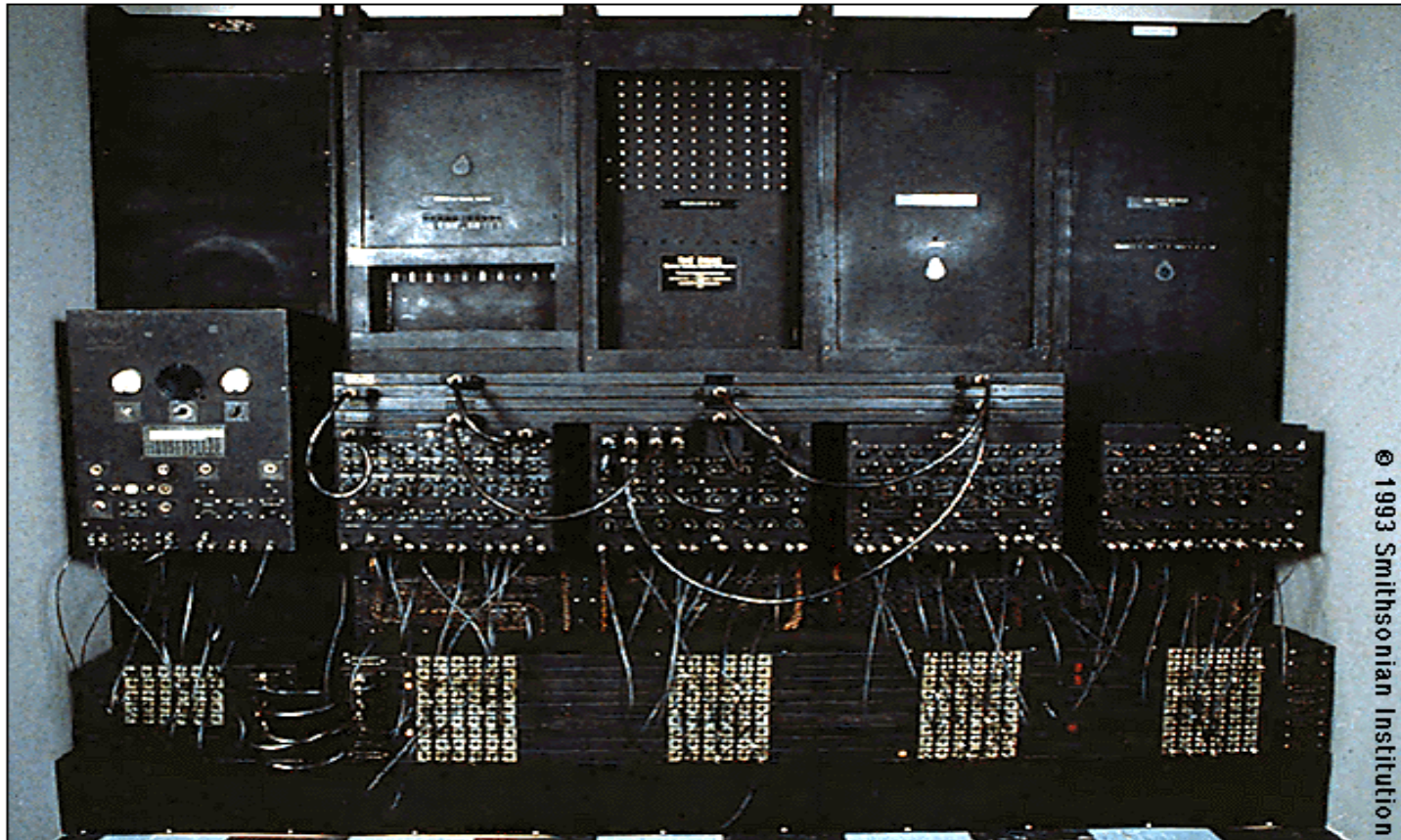
Invention of Telegraph – 1844-47



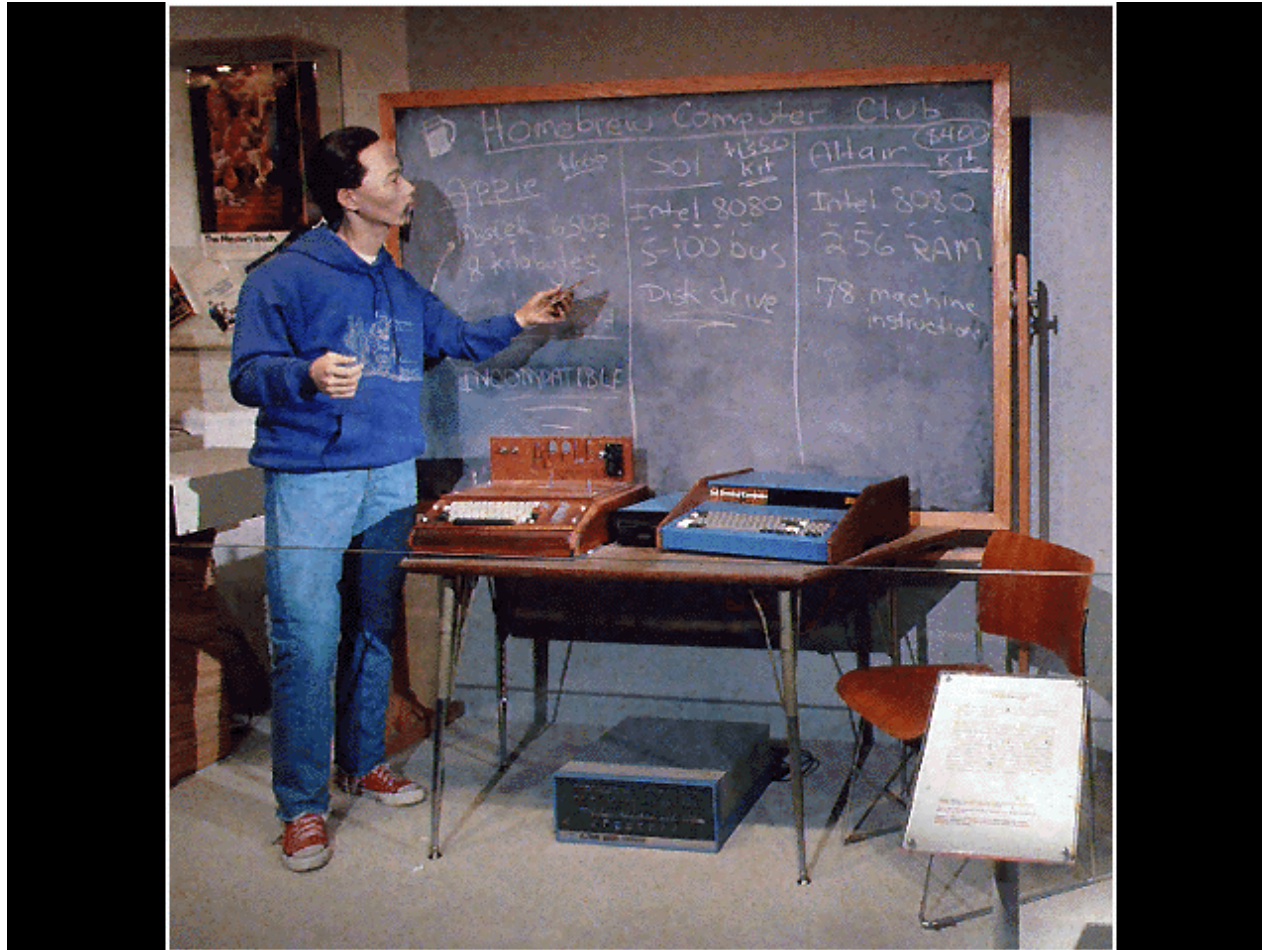
Reviewing the Recent Past

- ❑ 1949 ENIAC – First digital computer
- ❑ 1958 Integrated circuit (allows many things)
- ❑ 1969 First man on moon
- ❑ 1970 Credit card (VISA) and video cassette
- ❑ 1974 Laser printer
- ❑ 1978 First personal computer
- ❑ 1979 Barcodes, LCD panels, and Sony walkman
- ❑ 1980 Global positioning system
- ❑ 1981 Space shuttle
- ❑ 1985 Fullerenes discovered (carbon)
- ❑ 1993 World wide web
- ❑ 1996 Personal digital assistants

ENIAC 1949 First Digital Computer



Homebrew Club – SOL 20 ca 1977 (Altair was in 1975)



Paradigm Shifts are Underway

- Personalization
 - What you want, when you want it, how you want it, privately, and avoiding information overload
- Distributed power
 - Sony Walkman (1979), Personal Computer (1978), PDAs (1996)
- Connected
 - Internet (1969), WWW (1993), cell phones (1947), integration
- Information sources
 - Multiple sources and authors, good and bad info, everyone can be own editor and publisher

The Infrastructure Responds



Transformation of Institutions

□ Education

- Hybrid learning (ftf, web, experiential)
- Institutional competition and cooperation

□ Government

- E-government (az.gov, firstgov.gov)
- Efficient and effective

□ Business

- Knowledge management
- Productivity enhancement

Principles of Good Practice for Distance Education (equal to on-site education)

Joint effort of 8 regional accrediting associations (2000)

- Institutional Context and Commitment
- Curriculum and Instruction
- Evaluation and Assessment
- Student Support
- Faculty Support

AAHE 1991 Good Practices

(pre-web, web reinforces)

Good practice in undergraduate education:

1. Encourages Student-Faculty Contact
2. Encourages Cooperation Among Students
3. Encourages Active Learning
4. Gives Prompt Feedback
5. Emphasizes Time on Task
6. Communicates High Expectations
7. Respects Diverse Talents and Ways of Learning

The Campus Responds



Overview: Major Campus Events

Pre-1986 = Academic Support (Computer Center)

- 1975? PLATO (through Univ of Illinois)
- 1980 Making do in early days of transition
- 1984 NTU – Microcampus
- 1987 Cosy and ICosy
- 1984 Campus transition to microcomputers
- 1994 UAInfo (now UAWeb)
- 1995 Southwest Project begins
- 1995 Faculty Development Partnership and Learning Technology Partnership
- 1996 POLIS
- 1997 WILBUR and related tools/modules

Transformation of Campus Learning

- Learning Modules and Sharing
 - ADLnet, Merlot
- Customer focus
 - On-line student services, student support
- Flexible approaches
 - Formal and informal learning experiences
- Institutionalization of “new” approach
 - Best practices, student demand, no longer new

Campus Transitions – 1970-83

- ❑ Academic computing support is norm
- ❑ PLATO instructional program
- ❑ National Technological University (Microcampus)
- ❑ Arpanet (1969)
- ❑ E-mail (limited); bitnet (1981-96)

Early Computer Conferencing-1981 (UA Student Union Public Phone)



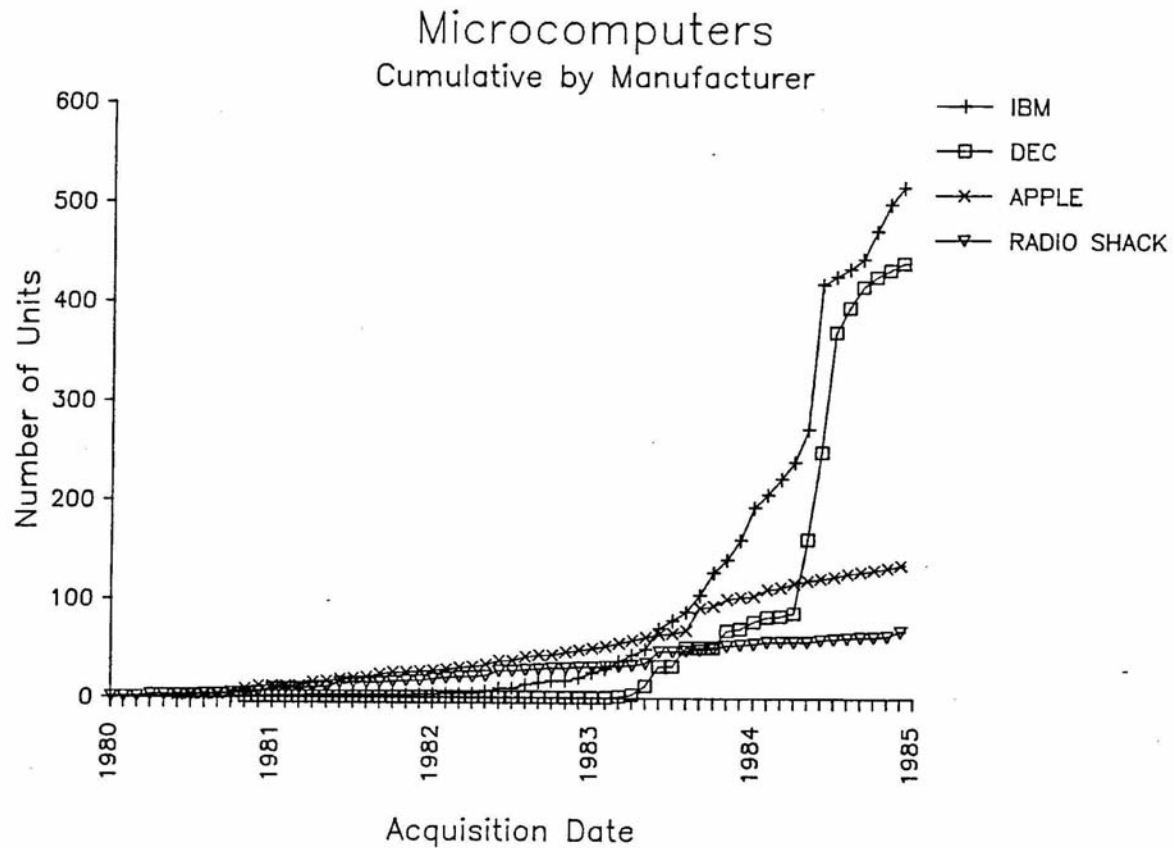
Fig. 2. A portable terminal can be used with a public phone.

Campus Transitions – 1984-1994

(transition to personal computing)

- ❑ Series of Task Force Reports on IT
- ❑ Coordinator for Info Services and Communications (new mainframe software, microcomputer matching funds, e-mail study, micro statistics study)
- ❑ Cosy and Icosy (1987)

Early UA Microcomputers



Campus Transitions – 1995-Current

- ❑ UA CORe Quality Management Program
 - Vice Provost – Martha Gilliland
 - Faculty Associate to Provost – Karen Smith
- ❑ Faculty Development Partnership
- ❑ Learning Technologies Partnership
- ❑ Faculty Center for Instructional Innovation (now Learning Technology Center)
- ❑ Funding for digital learning projects
- ❑ Faculty Assoc for Distributed Learning (now CIO)
- ❑ KUAT goes digital – increased to 4x capacity
- ❑ Continued modules for instructional purposes

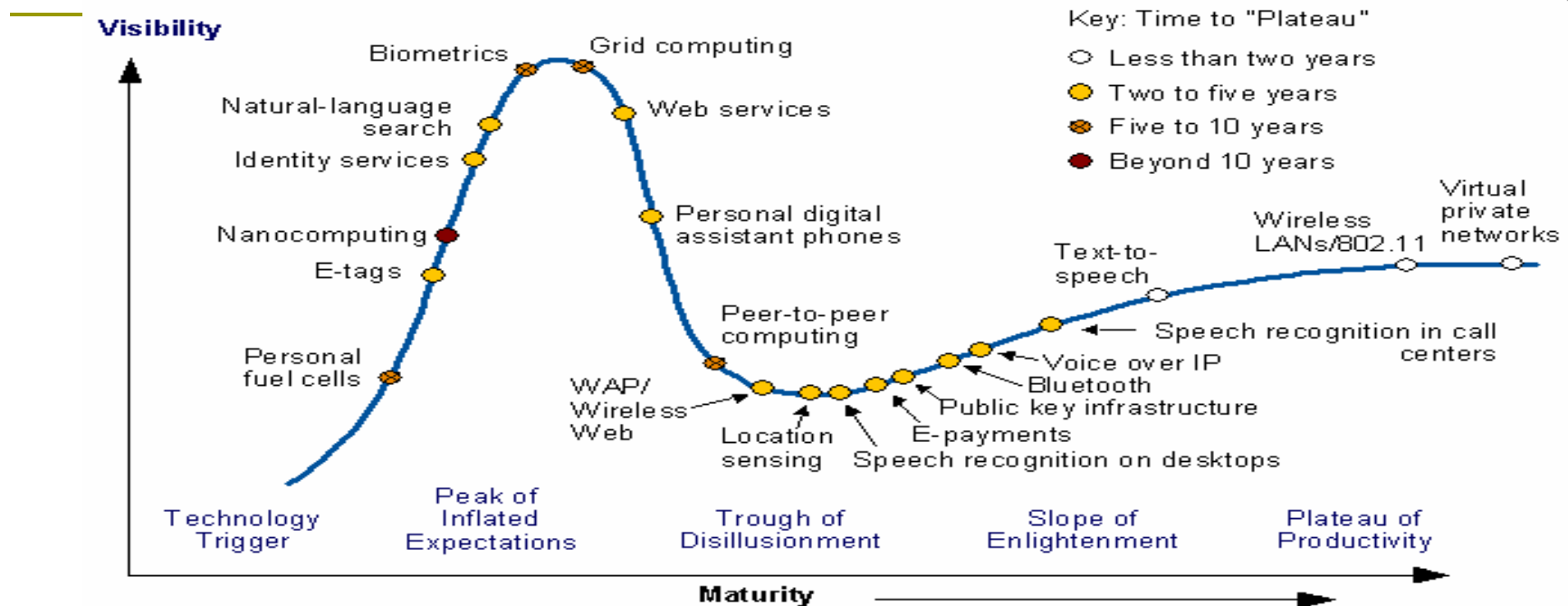
Anticipating the Future



Anticipating the Future

- Understand the driving forces of change
- Expect the unexpected (discontinuities and wildcards)
- Know what you don't know and avoid groupthink
- Read widely and try new things

Gartner Hype Cycle 2002



The five stages of the Hype Cycle are:

Technology Trigger: A breakthrough, invention, discovery, public demonstration, product launch or other event generates significant press and industry interest.

Peak of Inflated Expectations: During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the technology is pushed to its limits. The enterprises that make money during this phase are generally conference organizers, magazine publishers and consultants.

Trough of Disillusionment: Because the technology does not live up to its inflated expectations, it rapidly becomes unfashionable, and the press abandons the topic or touts its failure to meet expectations.

Slope of Enlightenment: Focused experimentation and solid hard work by an increasingly diverse range of organizations leads to a true understanding of the technology's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools become available to ease the development process and application integration.

Plateau of Productivity: The real-world benefits of the technology are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. The final height of the plateau varies according to whether the technology is broadly applicable or benefits only niche markets.

Looking Forward

- ❑ Smart devices and tags - everywhere
- ❑ Focus on personalization and ability for widely distributed activities
- ❑ Continued technical improvements will happen
- ❑ Reusable and modifiable learning objects
- ❑ Modular design with independent use of parts

We are Positioned for Further Change

- What will happen when...
 - Everyone can connect to everyone
 - Multiple computer/human interfaces exist
- Privacy and security issues will be solved
- Costs, particularly relative to alternative approaches, will continue to decline
- Major IT inventions of the last 25 years have given way to anticipation and optimism about the future

Dealing with Change

- From Joe Flower's (35) Change Codes:
www.well.com/user/bbear/change_codes.html
 - Expect change
 - Let people discover what works
 - Watch behavior, not structure
 - Don't penalize mistakes
 - Make the system a learning organism
 - Do what you are good at

Some Observations



What I Have Learned

- A few people can make a difference
- Everything has its time – ideas recycle
- Big changes have happened in last 25 years
 - More big changes will happen
 - Impacts will be more identifiable sooner
 - Previous big changes are still spawning results
- It is not worth arguing over which is the better learning approach – ftf or online

What If, in 15 years....

- ❑ Automated controls monitor and react to routine events, displacing 30% of the workforce as we know it today
- ❑ Virtual reality is used for current and historical discussions, and simulations for understanding new “what if” questions
- ❑ The equivalent of today’s telephone calls will be too cheap to monitor