

Computing Research Association

Conference at Snowbird 2000



Slides from a plenary session
on the topic of

“What are the Important Research
Areas for the New Millenium?”

presented by

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Monday July 10, 2000
8:40 am

<http://www.cra.org/Activities/snowbird/00/plenary1.html>

Topics and approaches for research in the new millennium.

David Clark

**M.I.T. Lab for Computer Science
Computer Science and
Telecommunications Board**

Approach

Start from what I actually understand:

Networking.

Generalize in two directions:

Topics

Approachs

Discuss some related activities of the CSTB

My background: the Internet

The fundamental: hooking everything together.

Faster is easy to explain but not the real issue.

The “-ilities” are what matter.

Reliability (out of untrustworthy parts...).

Heterogeneity (?).

Stability, etc.

Designing for scale. Bigger is better (harder?).

Validation of design.

Simulation of design.

Designing non-hierarchical systems.

Some wild generalities

(With an ack to those who think about evolution...)

Technologists do not determine the form of the outcome.

The outcome occurs when the system evolves in response to external forces.

- **Technologists provide the diversity.**

A natural trend is to add complexity.

Real breakthroughs occur with addition of simplicity.

- **The latter is harder.**

Modularity and function ossify--niches get filled.

- **Need a meteor now and then.**

Where do we need a meteor?

The Internet?

- **Not just yet... but the appliance/embedded processor era will be exciting.**

Some of my candidates...

User Interfaces.

- **Issues of ease of use.**
- **Unified models of interaction.**
- **Human input and output bandwidth.**

Searching and sorting.

A style of research

Systems people like to build things.

- **This is good...**

There are two related activities we should embrace:

- **Living with our users.**
- **Creating/discovering fundamental structuring principles.**

Creating simplicity.

- **Source: an overarching view of the goal.**

Reuse of code.

Invitation to the next session by the CSTB

In the session following, a presentation on/by the Computer Science and Telecommunications Board.

- **CSTB: part of National Academies, in DC.**
- **Gives advice to govt and nation on CS, T, networks, bits of EE, etc. Tech/policy intersection.**
- **Marjory Blumenthal, Executive Director.**

Four topics for session:

- **Recent study on IT R&D.**
- **New study on fundamentals of CS.**
- **Project for cross-disc research agendas.**
- **Asking the audience what we should be doing.**