

## IFS Reception

**Welcome once again...**

### **Some strategic thoughts**

For some time there have been growing signs that higher education in America would be facing a period of very unusual challenge...but also unusual responsibility and opportunity...due to changes in American society.

Think about it for a moment...

A few themes of the future...

The students we are educating today will spend the majority of their lives in the 21st century...

Yet most of us...and our faculties...are products of the 20th Century...

Furthermore, the structure of the American university as we know it today is a product of the 19th Century!

- i) A future in which our nation becomes a truly multicultural society, with a cultural, racial, and ethnic diversity that will be truly extraordinary in the history of our civilization...
- ii) A future in which America will become "internationalized"... in which every one of our activities must be viewed from the broader context of interdependence in the global community... as America becomes a "world nation", with ethnic ties to every part of the globe...
- iii) A future in which we rapidly evolve from a resource- and labor-intensive society to a knowledge-intensive society, in which intellectual capital...educated people and their ideas...become the keys to our prosperity, security, and well-being.

Let me dwell a bit on this last challenge, because we believe it is particularly relevant to the partnership our two organizations are building.

### **The Age of Knowledge**

Our traditional industry economy is shifting to a new knowledge-based economy, just as our industrial economy evolved from an agrarian society at the turn of the century.

A transition in which..

Intellectual capital--brainpower-- is replacing financial and physical capital as key to our strength, prosperity, and well-being

As Erich Bloch, Director of the National Science Foundation puts it, we have entered a new age, an "Age of Knowledge in a Global Economy"

In many fields, the knowledge base is doubling every few years...

Furthermore, the typical college graduate of today will likely change careers several times during a lifetime...

It will be a future in which permanence and stability are discarded in favor of flexibility and creativity... in which the only certainty will be the presence of continual change...

opportunities during the 1990s...a period in which

A Case Study: The "Electronic" University

opportunities during the 1990s...a period in which

Some of us were convinced that the computer would rapidly involve from simply a tool for scientific computation or information processing into an information technology

infrastructure absolutely essential to all  
of our activities...from research to instruction  
to administration

We set a rather

ambitious goal: To build the most sophisticated  
information technology environment of any  
Engineering college in the nation...an environment  
that would continually push the limits of what could  
be delivered in terms of power, ease of use, and  
reliability to our students, faculty, and staff.

We sought a distributed intelligence, hierarchical  
computing system linking personal computer workstations,  
superminicomputers (and, more recently, minisupercomputers)  
mainframe computers, function specific machines,  
library access, a host of various servers, and  
gateways to international networks and facilities such  
as the NSF SCC, national data centers, etc.

Managed to recruit people with the vision  
and energy to make this a reality...

Doug Van Houweling

Structures...

CITI

Center for Information Technology Integration

CMI

Center for Machine Intelligence

Cognitive Science and Machine Intelligence Lab

EXPRES

NSFnet (IBM, MCI)

NSF Supercomputer centers

NASA, Internet, National Research Network

MITN

Today...

- i) roughly 2400 public student workstations  
(including exciting programs like RESCOMP)  
(funded through \$220-\$400/y fee...  
gives us \$10 M/year of venture capital to  
play with)
- ii) roughly 20,000 workstations
- iii) student purchase plan...  
MacTruck -- truckload sales...  
Phase I: 2400 systems in 24 hours  
Phase II: \$10 M of product in 24 hours
- iv) in another week or two UM will announce one  
of largest installations of mainframes in world...  
all networked together into an institution-wide  
file system (actually, the last of these machines  
came up last weekend) (two 3090-400Es and one  
3090-600E)
- v) 80,000 users on system
- vi) UM has become the focal point in efforts to build  
the "interstate highway system" of information  
exchange...with EXPRES, NSFnet, internet,  
MITN,...coordinate access to NSF SCCs...  
National Research Network

Tomorrow...

Now riding the "fourth wave" of the use of  
information technology...where the computer  
becomes not simply just an information processing  
tool, but rather a medium of communication,  
cooperation, and collaboration...an entirely new  
intellectual endeavor

Personal computing to "interpersonal computing"

As the result of the rapid spread of personal computers and computer networks, and the development of new insights into human cognition and group behavior, we are at the threshold of a major shift in the underlying paradigms and uses of information technology. The shift will be from solo use of personal computers to group use of collaboration technology.

DEVH Boast:

"To achieve and retain leadership, should be investing 10% of operating budget in info tech!"  
(10% of \$1.5 B = \$150 M/y...currently \$95 M/y)

See you at EDUCOM-89 in Ann Arbor!!!

### **Knowledge-Based Organizations**

In reality, we are attempting to develop the UM as the prototype of a knowledge-based organization of the 21st Century.

### **Partnerships**

Obviously we cannot do this alone. Hence, key in this effort are strategic partnerships with leading companies such as IBM

### **Conclusion**

Both of our organizations aspire to leadership...  
And I believe both can achieve it...if we work together.  
Big Blue...and Maize and Blue...  
quite a powerful team, I would say!  
Go Blue!!!