

Ann Arbor Rotary Talk - January 9, 1985

Media Hype

We've been bombarded by lots of media hype in recent months that would suggest that Ann Arbor may become a focal point of high-tech R&D...the high-tech mecca of the midwest... and perhaps even of the nation.

Some Antedotes

John Naisbitt--Megatrends

Ann Arbor as tops in nation for small high-tech business

New York Times article

High Tech is spurring the race to retool in the Midwest

"This is where the technol action is going to be for the next 20 years"...Conway

Good Morning, America

Financial analysts point to "Automation Alley"

California dreamin'

All of Silicon Valley is buzzing about Ann Arbor

What is going on here?

Why all this excitement about Michigan -- and Ann Arbor?

Is there fire beneath all the smoke???

There are four reasons for the excitement...

Reason #1: Intellectual

Michigan is where our nation makes things...

Cars, refrigerators...machines that make cars ...

Surrounded by excitement of industry in transition

"factory of the future"

robotics, machine intelligence, animate systems

EDS, Hughes, Saturn

But these are just tip of the iceberg!!!

A fascinating and unique convergence of technology...

The chip, computers, AI, new materials, mech systems

Driven by money (investment) and need (competitiveness)

Michigan-->nation's source of emerging industrial technology

A transition is occurring in which..

Intellectual capital ("brainpower") is replacing

financial or physical capital as key to economic development

Reason #2: Leadership

Leaders in our state have recognize the importance of technology

Some facts of life for Michigan (and Ann Arbor)

The Michigan Economy

State becomes prosperous in only way:

By increasing value of goods and services that industries

in its economic base sell outside the state.

Industries

such as retail trade and medical services do not contribute

to economic base, but simply shift resources internally

from one economic sector to another.

Michigan's economic engine:

--and will remain for the foreseeable future --

durable goods manufacturing.

Challenge:

Must shift Michigan's economic base toward those products

and processes that are less vulnerable to low-wage competition and more dependent on human skills.

Key: Michigan must become America's factory of the future

The nation's center of complex manufacturing processes...

The world's source of emerging industrial technology...

Note: New technology ("high-tech") in Michigan will not be a separate industrial sector...

rather it will be at the heart of every industrial sector

Michigan leaders have not only recognized importance of technology

The have also demonstrated vision & courage to make key investments

Attempting to establish clear priorities critical to future

Then to develop mechanisms to focus resources on priorities

Some examples:

Roger Smith's efforts to build the corporation of the future

GM + EDS + Hughes, Saturn,...

Governor Blanchard's efforts

Attempting to improve small business environment

Reemphasizing importance of higher education

New initiatives: REEDF

Others: Bill Hubbard, Harold Shapiro, Sam Irwin

Ted Doan, Dwight Carlson,...

New initiatives:

Industrial Technology Institute

Molecular Biology Institute
Michigan Materials Processing Institute

Reason #3: Attitude

Conviction

Importance of individual achievement, of excellence

Example:

Apple philosophy...enormous confidence in the
ability of talented people to do great things

General Motors philosophy...an effective
organization

can accomplish great things, even with mediocre
people

Our Goal:

To establish an intense, entrepreneurial environment...a no-
holds-barred, go-for-it culture...in which individual initiative,
achievement, and the quest for excellence are dominant
elements.

Reason #4: Some unique resources

The University of Michigan and its College of Engineering

6,000 of the most talented engineering students in the
nation

over 1,000 scientists and engineers pushing at the cutting
edge

Suggestion: The U of M will play a key role in making Ann
Arbor

the focus of the economic renaissance of the industrial
midwest!!!

Key factors in technology-based economic development

Technological innovation

Technical manpower

Entrepreneurs

Importance of world-class research universities

Strong evidence to suggest that a primary catalyst and necessary ingredient in technology-based industrial development is the presence of a world-class engineering school.

Look around:

New England: --> MIT

Bay area-Silicon Valley --> Stanford & UCB

Southern California --> Caltech

Austin --> U. Texas

Why?:

Produce talented engineers to implement new technology

Through research produce creativity necessary for innovation

Attract "risk capital through federal R&D

Key to technology transfer

Traditional: graduates, publications

Entrepreneurs

Startups

A fact of life:

Only world-class research universities are capable of major impact

Must play in the big leagues...with MIT, Stanford, Berkeley...

To attract the outstanding faculty and students
and massive resources necessary for technological
leadership

Only a handful of such schools -- not more than a
dozen or so

UM Engineering

Fortunately, the U of M is just such an institution

Status:

Reputation: Generally ranked 5th or 6th nationally
(most of its engineering programs are ranked in top
ten)

Capacity:

Enrollment: 6,000 students

Degrees: 1,900 per year (1st or 2nd in nation)

Student Quality:

Entering students: 98th percentile of HS graduates

1280 SATs, 3.8 GPAs

30% are straight 4.0 students

Research activity:

\$48 million per year

spanning all areas of engineering and applied science

Other parameters:

320 faculty

1,200 staff involved in research activities

1,000,000 nsf physical plant

Operating Budget: \$82 million

Revenue: \$72 million

Opportunity

A view of all the construction going on over on the University's North Campus might convince you that lots of things are changing. But the changes in our physical facilities pale in comparison with the changes occurring in the human resources of the College.

Rebuilding faculty:

100 new faculty in past 5 years

...from best institutions, working with best scholars

Success: in 1985-86, 32 out of 38

120 to 140 in next 5 years

by 1990, over one-half of faculty will be new!!!

A very young and aggressive faculty...

with very high standards and expectations!!!

Facilities

Finally (after 30 years) completing North Campus move

Will have all programs on North Campus by this summer!

Space will be a bit cramped...and more needed...

but at least we are finally together!

Strategy and Philosophy

Renewed commitment to excellence!

We are convinced that only the best will do!

And we refuse to settle for any thing less...

in the achievements of our students and faculty...

and in the opportunities we provide them!

The Key to Excellence

Lies with people, with their abilities and commitments.

Our fundamental goal:

To attract and retain the best people...

Provide them with the environment necessary to achieve

And then get the hell out of their way...

And let them get the job done!

Second key factor:

Belief that the quality of our programs will be more important than their breadth or capacity.

To determine what we can do the best, and then to take the sometimes painful steps to shift resources into these areas...to focus our resources and effort to achieve excellence.

Some examples of the excitement

CRIM - ITI

The Center for Research on Integrated Manufacturing, responsible for the basic research and instruction necessary to sustain the Industrial Technology Institute -- to maintain the momentum of Automation Alley now developing in Michigan

CMI - EDS

The Center for Machine Intelligence, an exciting new venture formed with the participation of industry and federal government to explore the whole new technology of thinking machines -- machines that can perceive their environment, think, and act... First applications will be in manufacturing. However, the next generation of thinking machines will be designed and built by intelligent machines!!! Note it's address is 200!

CAEOT

The Center for Advanced Electronics and Optics Technology, aimed at research into the marriage of electronics and odptics -

- lasers on a chip. It will be the largest university laboratory in the nation specializing in ultra high speed, high frequency electronic devices and advanced electronic materials such as gallium arsenide.

CITI

The Center for Information Technologies Integration, essential a "skunkworks" operation, exploring the forefront of modern computer telecommunications with several of the leading companies in the nation. The U of M will be the laboratory, the "test-bed", for this exciting venture.

Some people:

Lynn Conway

Doug Van Houweling

Ron Gibala

Al Schultz

Jerry Faeth

Albert Yee

John Hayes

Summary:

UM has reprioritized its programs to better align them with industry...made new commitments and investments...attracted to Michigan some extraordinarily talented and exciting engineers and scientists...all in our effort to play the role that we must in Michigan's technological and future.

Some dark clouds

Traditional attitudes die hard...

Misunderstandings

Cannot prosper with a service economy

(e.g., RHP or bedroom community)

AA's strength: brainpower!!!

Attitudes on part of elected public officials

Attitude in Legislature

Porkbarrel attitude toward higher education

Ex: Across-the-board funding (REEDF)

Ex: Olympic Training Village

Ex: New engineering schools

Attitude in Ann Arbor

Hostility toward growth and economic development

Ex: Taxation of nonprofit research institutes

which are attempting to rebuild Michigan

ERIM

Industrial Technology Institute

Center for Machine Intelligence

Hughes Medical Research Institute???

Extraordinarily short-sighted attitude

Suspicion:

Less a concern about revenue

(after all, jobs and spinoffs generate \$\$\$)

Rather an attempt to legislate the area

of research --

Industrial technology is bad...

Health sciences are good...

Traditional Midwest Attitude:

Bill Hubbard

an extraordinary intolerance of extreme excellence!

We always seem to act as if we had a morale responsibility

to level out peaks of excellence -- to pull everybody down

to the same level of mediocrity.

Conclusion

Remember key operating principles:

People-dependence

In the long run, people are the key to excellence.

If Ann Arbor -- and indeed, Michigan, wishes to prosper, we must attract to our community and institutions

individuals of extraordinary talent and drive, and then provide an environment in which they can flourish, without

constraints, without hassles. We have to establish an "entrepreneurial" environment in which people are encouraged

to push to the limits of their abilities.

Prioritization and commitment to excellence

We must recognize that the achievement of excellence requires

first prioritizing our efforts, and then focussing resources

to become the best in these endeavors. At the U of M we are attempting to do just that in areas we believe are critical to the future of this community and this state. I would suggest that this same philosophy must become deeply

imbedded in public policy over the long term if our community and our state are to grasp the extraordinary opportunities that now lie before us on a silver platter

Conclude by paraphrasing a quote from Frederick Terman

former dean and provost of Stanford

and "father" of Silicon Valley

Our future will depend on our ability to establish
priorities and focus resources to build
"spires of excellence" in areas of technology critical
to our state's and our nation's future!