

High Tech in Michigan

The challenge of dramatic economic change...

Traditional industry economy is shifting to a new, knowledge-based economy

just as our industrial focus evolved from an agrarian society at the turn of the century.

The days of low interest rates, limited foreign competition,

slow-moving technology, stable markets, and mass production processes that once allowed our industries to thrive in a sheltered environment have long since passed. Michigan must develop an agenda to achieve and sustain prosperity in a new environment of intense international competition and rapid technological change.

Intellectual capital -- brainpower -- is increasingly regarded as the key element

needed to compete effectively in a highly technological and rapidly changing global economy.

The Michigan Strategy

Blessed with public leaders that recognized this...

had the vision to develop a forward-looking strategy to respond... and the courage and skills to implement this strategy...

Economic prosperity lies not in tearing down our old industrial

base for a different kind of economy, but in helping that base make the changes necessary to compete in a new economic environment.

The goal: Michigan must become America's factory of the future...

its source of emerging industrial technology...

Our ability to innovate will become our principal economic advantage...

innovation will be the energy that drives change

To position Michigan as the nation's source of emerging industrial

technology, we recognized we must move along three fronts:

1. To enhance the growth of R&D in Michigan
2. To accelerate the transfer of technology into Michigan industry
3. To develop a strong coalition within Michigan among government, industry, labor, and universities to create a "venture culture"

As we look to the knowledge-intensive future of Michigan, we recognize as

have so many other states that it will be our great research universities that will hold the key to our collective prosperity.

For this reason, leaders of state government, business, labor, and industry

have called for a renewed investment in these institutions so essential to sustaining the strength of our economic base.

Importance of Research Universities

Key factors in technology-based economic development

Technological innovation
Technical manpower
Entrepreneurs

Importance of world-class research universities

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

Development of Unique State-University Partnership

Universities committed themselves to:

Strategically realigning activities into key thrust areas
of major importance to State...
Attracting leading scientists, engineers, and professionals
to staff these programs...
Developing new mechanisms for technology transfer...

State government committed itself to:

Establishing higher education in general and the state's
research universities as a high priority
Providing seed resources to sustain key thrust areas
Developing novel institutions to act as catalysts in these activities

State Actions:

Vision and courage of leaders such as Governor Blanchard...

Recognized the importance of technology to Michigan's future...
Also were willing to make the investments today necessary
for Michigan's prosperity tomorrow...

1. Research Excellence Fund

\$25 into building key research areas within research universities

2. Centers of Excellence

Industrial Technology Institute
Michigan Biotechnology Institute
Michigan Materials Processing Institute

3. Michigan Strategic Fund

4. New coalitions and partnerships

Fraser-Iacocca Commission on Jobs and Economic Development

5. . Key Team:

Doug Ross, Pete Plastrik, Jamie Kenworthy

University Actions:

Key:

Began to think and act strategically...how to better position ourselves

Recognition:

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

Hence, we chose as our thrust areas...

Complex manufacturing systems
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

Machine Intelligence

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!!

Advanced electronics and optics technology

CAEOT

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

Information Technology

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.

Biotech applied to clinical methods

Enormous investment in health care...at universities...

UpJohn, Waner-Lambert,...

Unusual strength in molecular genetics...

Hughes Medical Research Institute

Other steps

1. Recruiting key engineers and scientists
2. Modifying ways we interact with outside world...
Strengthened interactions with industry
3. Intellectual property policies
4. Michigan Information Technology Network...

Some Signs of Progress:

Already clear evidence of payoff...

1. Darling of the national press...
Hardly a week goes by without some reference to the phenomena occurring in "Automation Alley"...from Warren to Ann Arbor...
an area now clearly identified as the hot spot of action in technology for the next two decades...
California dreamin'
Places like Silicon Valley and Route 128 are buzzing about Michigan...we are now raiding their best talent...
We've become a showplace: Bobby Inman, Governors,...
2. University's federal research increased by 25% --
industrially sponsored research has increased by 50%
3. Research Excellence Fund has created nationally recognized centers in:
Complex manufacturing technology
NSF believes we now have best faculty in nation in these areas
Machine intelligence
Advanced electronics
Information technology
These programs already have attracted three major national research centers funded at \$27 M.
4. UM has been selected as lead institution in EXPRES project to develop a nationwide computer-communications network linking together American research universities, federal government, and industry.
We are approaching State government for assistance in getting Michigan on-board at an early stage with a similar network linking state universities and colleges with all communities
5. Also attracted the Howard Hughes Medical Institute, a massive private effort aimed at making Michigan the leader in clinical applications of molecular genetics.
6. Confidence in University, buoyed by the new priority given by higher education by the state, have enable use to attract to our faculty many of the world's leading scholars and teachers, scientists and engineers.
7. And, at the same time, the University has continued to leverage the state's investment, attracting \$2 from outside the state for every \$1 in state appropriation. Moreover, activities of our graduates and applications of our reserach have an impact on state's economy that totals in the billions of dollars.

Cultural Changes

Reaffirmation of the importance of individual achievement,
of excellence...We have once again recognized the ability
of talented people to do great things -- if we will only
get out of their way and let them!

Importance of establishing 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

Michigan is on the move!

State has taken strong first steps to rebuild capacity of its research
universities to provide the knowledge-based resources so necessary
to our long term well-being and prosperity.

Indeed, Michigan is rapidly becoming a model for the nation of the
advent of an exciting new competitive age.