

Regional Learning Ecologies

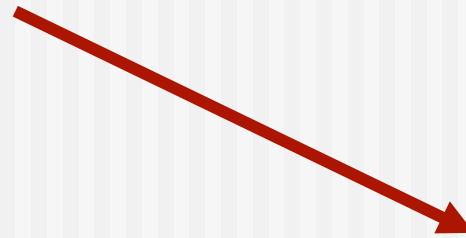
A Technology
Roadmapping
Exercise

A 21st Century Learning System

- High-quality, cost-effective, diverse
- Seamless, life-long
- Asynchronous (any time, any place, anyone)
- Ubiquitous (every time, every place, everyone)
- Adaptive, mutating, evolving
- **A learning ecology**

An Alternative Approach

Strategic Planning
for a
Society of Learning



Technology Roadmapping
for a
Learning Ecology

Roadmapping Exercise

- Environmental Scan
- Resource Mapping
- Educational Needs Assessment
- Gap Analysis
- Development of Roadmap

Environmental Scan

Michigan faces three major challenges:

- The emergence of an economy based on knowledge—educated people and their ideas—and powered by the breathtakingly rapid development of new digital technologies;
- The globalization of the world's economy and culture enabled by technologies of communication and travel; and
- The demographic changes in the American population bringing hitherto under represented groups into a majority of the workforce.

A Social Transformation

The 20th Century

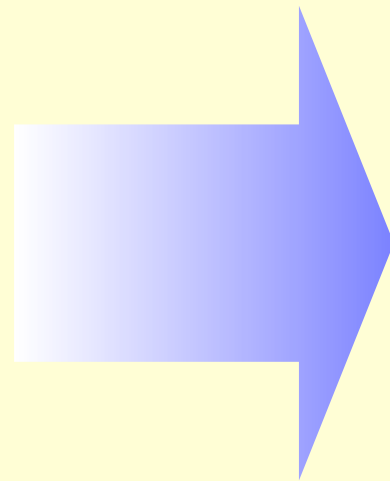
Transportation

Cars, planes, trains

Energy, materials

Nation-states

Public Policy



The 21st Century

Communications

Computers, networks

Knowledge, bits

Nationalism

Markets

The Age of Knowledge



Educated people and ideas

Prosperity

Security

Social well-being

**Educated people are the most valuable resource
for 21st societies and their institutions!!!**

The Forces of Change

The Age of Knowledge

The Knowledge Explosion
Globalization
The High Performance Workplace
Diversity
Accelerating Technological Change
Nonlinear Knowledge Transfer

Changing Societal Needs
Financial Imperatives
Technology Drivers
Market Forces

Forces of Change

A Changing World

The Knowledge
Explosion

Globalization

High Performance
Workplace

Diversity

Technological Change

Knowledge Transfer

Forces on the University

Economics

Societal Needs

Technology

Markets

Evolution?

Revolution?

Extinction?



The Future of the University?

“Thirty years from now the big university campuses will be relics. Universities won’t survive. It is as large a change as when we first got the printed book.”

– *Peter Drucker*

“If you believe that an institution that has survived for a millennium cannot disappear in just a few decades, just ask yourself what has happened to the family farm.”

– *William Wulf*

“I wonder at times if we are not like the dinosaurs, looking up at the sky at the approaching comet and wondering whether it has an implication for our future.”

– *Frank Rhodes*

Moving to the 100,000 foot level...

- The Current Budget Crunch (both in U.S. and Europe)
- Changing Education Needs of a Knowledge Society
- Diversity
- Technology
- Intellectual Change
- Global Sustainability
- Markets

In the United States

- Public universities are facing devastating cuts in support as states struggle to cope with crushing budget deficits and private giving erodes in a weak economy
- Example: UM has lost 20% of its state support over past three years, with more cuts on the horizon (amounts to over \$2,000 per student). State support is now less than it was in 1996...and continuing to drop.
- The Triple Whammy: “Increasing enrollments, declining state and philanthropic support, and rising expectations on part of students and broader public”

The usual ebb and flow?

- Isn't this just the usual ebb and flow? States cut budgets during bad economic times, and then restore funding (and then some) when recovery occurs.
- But this time it may be different...
- State budget officer: "College leaders are fooling themselves if they think the end of this recession will be like all the others. What we are seeing is a systematic, careless withdrawal of concern and support for advanced education in this country at exactly the wrong time!"

The same is happening in Europe and Asia

- Erosion of public support is a consequence of “massification”.
- Tax revenues once support only university education for the elite (e.g., Oxford and Cambridge) are now stretched beyond capacity to fund higher education for an appreciable fraction of the population.

Somewhat different in the United States

- A transition from “guns” to “pills”, as a nation, which once viewed education as critical to national security, now seems more concerned with sustaining the social benefits demanding by an aging baby boomer population.
- The priorities of these aging voters are health care, prisons, homeland security, and tax relief (and to hell with the kids...)
- Unlikely to see a better balance between consuming for present desires and investment for our children’s future for at least several decades.

The Irony: An Age of Knowledge

- Today we have entered a new “age of knowledge” in which the key resource necessary for prosperity has become knowledge itself—educated people and their ideas.
- A radical new system for creating wealth has evolved that depends upon creating and applying new knowledge.
- Unlike physical resources, knowledge is inexhaustible; the more it is used, the more it multiplies and expands.
- But it can only be created, absorbed, and applied by the educated mind!

Implications of a global, knowledge-driven economy

- Throughout the world, nations are realizing that the quality of their workforce, their education and skills, are the key to their prosperity and security.
- National Governors Association: “The driving force behind the 21st century economy is knowledge, and developing human capital is the best way to ensure prosperity.”
- Recall “space race” of 1960s, which emphasized educating “the best and brightest”.
- Today, the “skills race” values instead the skills and knowledge of the entire workforce as the key to prosperity, national security, and social well-being.

An Example: Outsourcing

- U.S. has already lost most low skill, high pay jobs in manufacturing to Asia and Latin America
- Today it is losing high tech jobs to India and China
- Tomorrow, the convergence of the gigantic source of human capital represented by India, China, and Russia threatens will have serious implications for sustaining our standard of living
- (We cannot maintain prosperity by just mowing each other's lawns...)

Information Technology and the Future of the Research University

Premise: Rapidly evolving information technology poses great challenges and opportunities to higher education in general and the research university in particular. Yet many of the key issues do not yet seem to be on the radar scope of either university leaders or federal research agencies.



**PREPARING FOR THE
REVOLUTION**

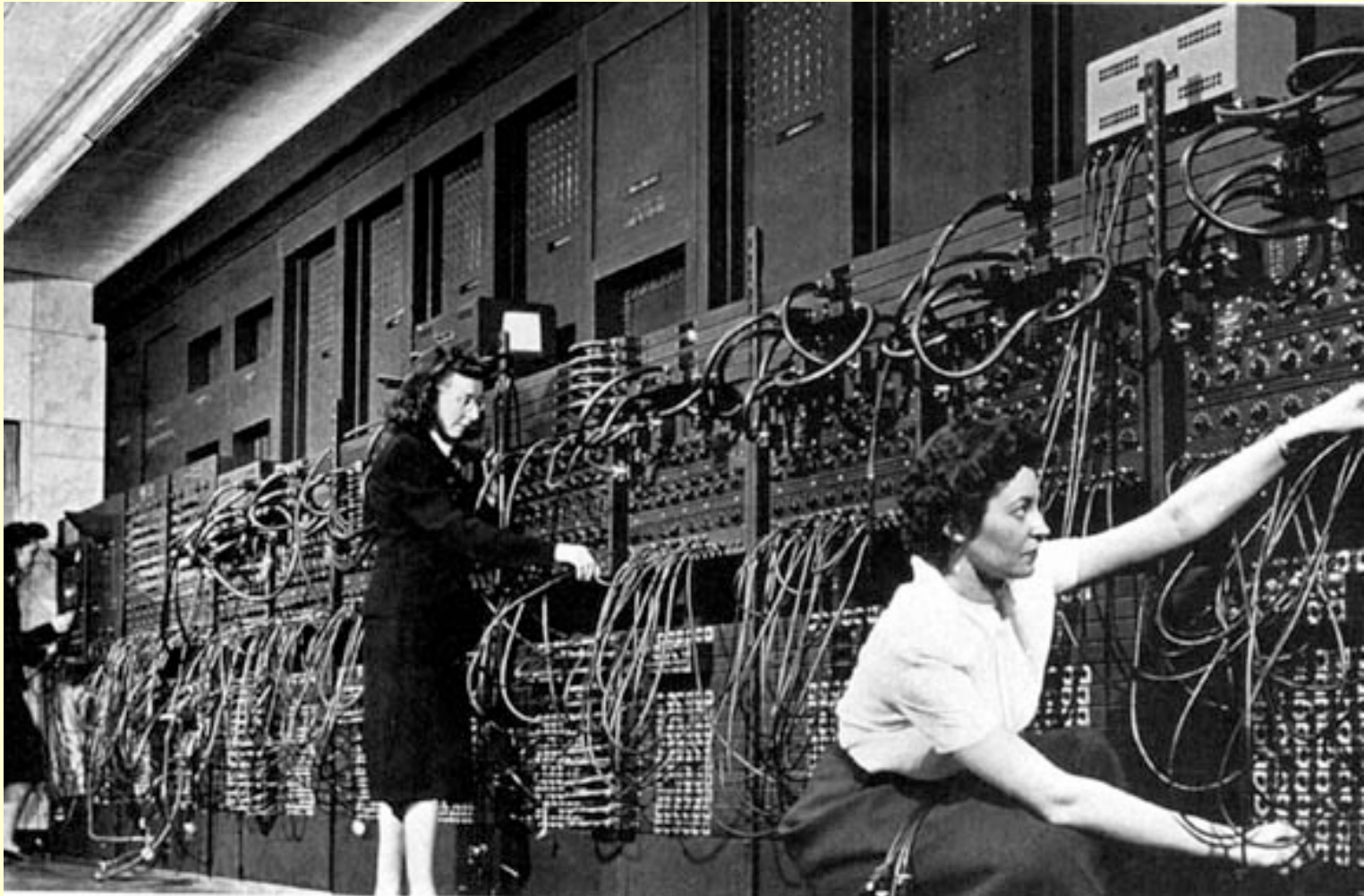
**Information Technology
and the Future of the
Research University**

NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

Phase 1: Conclusions

- There was a consensus that **the extraordinary evolutionary pace of information technology is likely to continue for the next several decades** and even could accelerate on a superexponential slope.
- The event horizons for disruptive change are moving ever closer. There are **likely to be major technology surprises**, comparable in significance to the appearance of the personal computer in the 1970s and the Internet browser in 1994, but at more frequent intervals. The future is becoming less certain.

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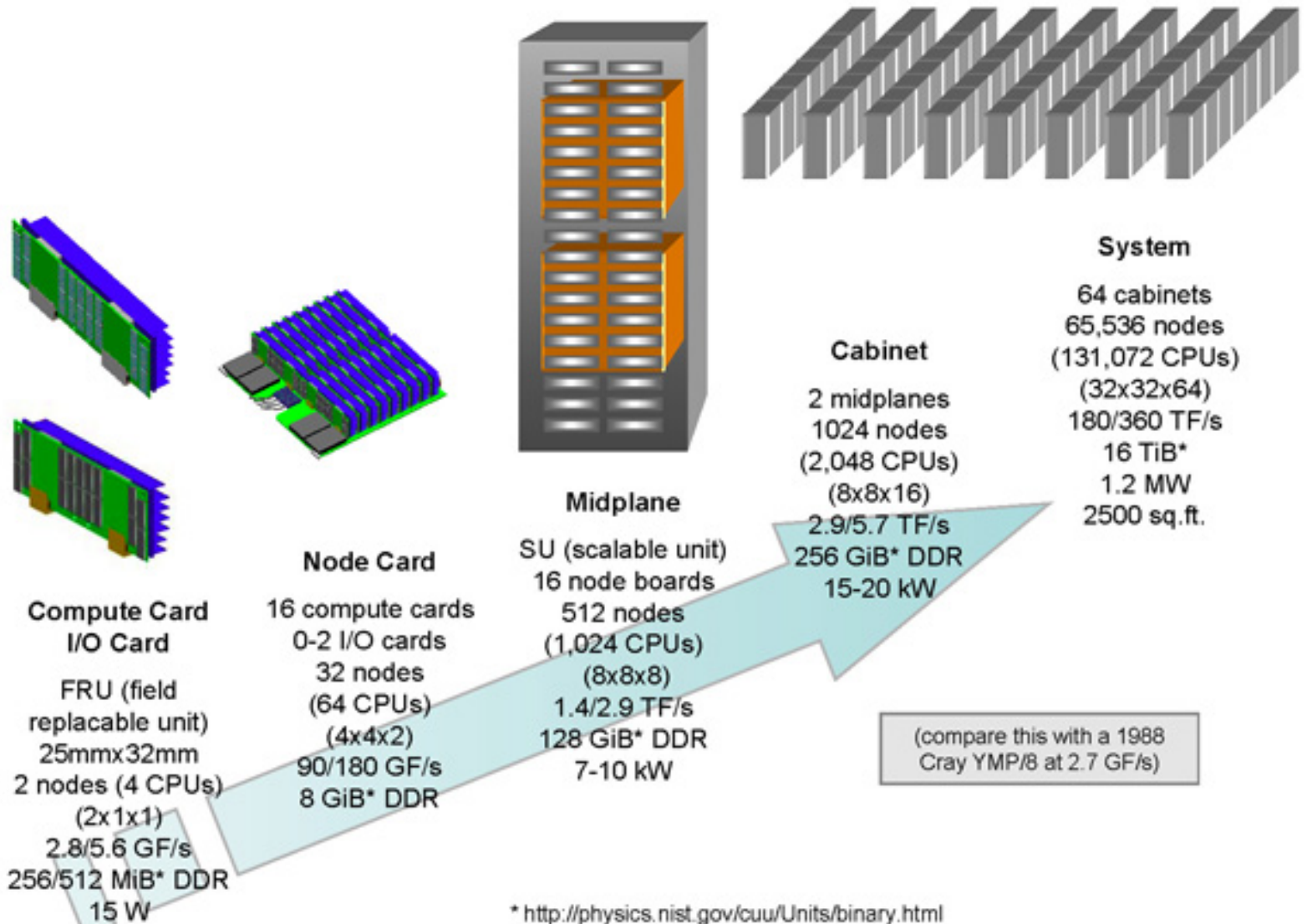


To ASCII "Q" ... and beyond





Building BlueGene/L



* <http://physics.nist.gov/cuu/Units/binary.html>

Conclusions (continued)

- The **impact of information technology on the university will likely be profound, rapid, and discontinuous**—just as it has been and will continue to be for the economy, our society, and our social institutions (e.g., corporations, governments, and learning institutions)
- It will affect our **activities** (teaching, research, outreach), our **organization** (academic structure, faculty culture, financing and management), and the broader higher education **enterprise** as it evolves into a global knowledge and learning industry.
- Information technology is a **disruptive technology** in higher education that requires strategic attention.

The new students

- Today a college degree is necessary for most careers (and a graduate degree for an increasing number)
- Some growth in 18-22 year old population (15%)
- More growth in population of adults seeking advanced education
- The high performance workplace puts them only one paycheck from the unemployment line.
- By 2010, over 50% of college students will be working adults over the age of 25!

The plug-and-play generation

- Your generation, raised in a world drenched in interactive media, approaches learning in a different way.
- Interactive, collaborative
- Instant messaging, “google-ing”
- Peer-to-peer learning
- Taking over control of the learning environment







A transition in pedagogy

- From “just-in-case education”, based on degree programs early in one’s life
- To “just-in-time education”, where knowledge and skills are sought during a career
- To “just-for-you education”, where learning opportunities are customized to the needs of the student.
- Both adult and digital generation students are evolving into active learners and eventually demanding consumers of educational services!

Conclusions (continued)

- Yet, **for at least the near term**, meaning a decade or less, **the university will continue to exist in much its present form**, although meeting the challenge of emerging competitors in the marketplace will demand significant changes in how we teach, how we conduct scholarship, and how our institutions are financed.
- Universities must anticipate these forces, develop appropriate strategies, and make adequate investments if they are to prosper during this period.
- **Procrastination and inaction are the most dangerous courses of all during a time of rapid technological change.**

Conclusions (continued)

- Because of the profound yet unpredictable impact of this technology, it is important that institutional strategies include:
 - *the opportunity for **experimentation**,
 - *the formation of **alliances** both with other academic institutions as well as with for-profit and government organizations, and
 - *the development of sufficient **in-house expertise** among the faculty and staff to track technological trends and assess various courses of action.

Diversity

- Increasing diversity of American population with respect to race, ethnicity, nationality is one of our greatest strengths and challenges
- A diverse population gives us a great vitality, but it is complicated by social and economic factors (including segregation and nonassimilation of minority cultures).
- Traditional methods use to achieve diversity (affirmative action) are challenged in the courts, legislatures, and through referenda.

The Decisions

On June 23, 2003, the U.S. Supreme Court upheld the right of universities to consider race in admissions procedures in order to achieve a diverse student body. In two lawsuits challenging University of Michigan admissions policies, the court ruled 5-4 in favor of the Law School and, by a vote of 6-3, reversed, in part, the University's undergraduate policy, while still allowing for the consideration of race in admissions.



Justice Sandra Day O'Connor presented the majority opinion in the Law School case. The Equal Protection Clause, she wrote, does not prohibit the Law School's narrowly tailored use of race in admissions decisions to further a compelling interest in obtaining the educational benefits that flow from a diverse student body.

The Chief Justice, Justice Powell's view that student body diversity is a compelling state interest that can justify using race in university admissions. The Court defers to the Law School's educational judgment that diversity is essential to its educational mission. . . . The Law School's claims are further bolstered by extensive expert studies and reports showing that such diversity promotes learning, diversity and better prepares students for an increasingly diverse workforce, for society, and for the legal profession. . . .

The Law School engages in a highly individualized, holistic view of each applicant's file, giving serious consideration to all the ways an applicant might contribute to a diverse educational environment. . . .

Finally, race-conscious admissions need to be limited in time. The Court takes the Law School at its word that it would like nothing better than to find a race-neutral admissions formula and will terminate its use of racial preferences as soon as practicable. The Court expects that 25 years from now, the use of racial preferences will no longer be necessary to further the interest advanced today.



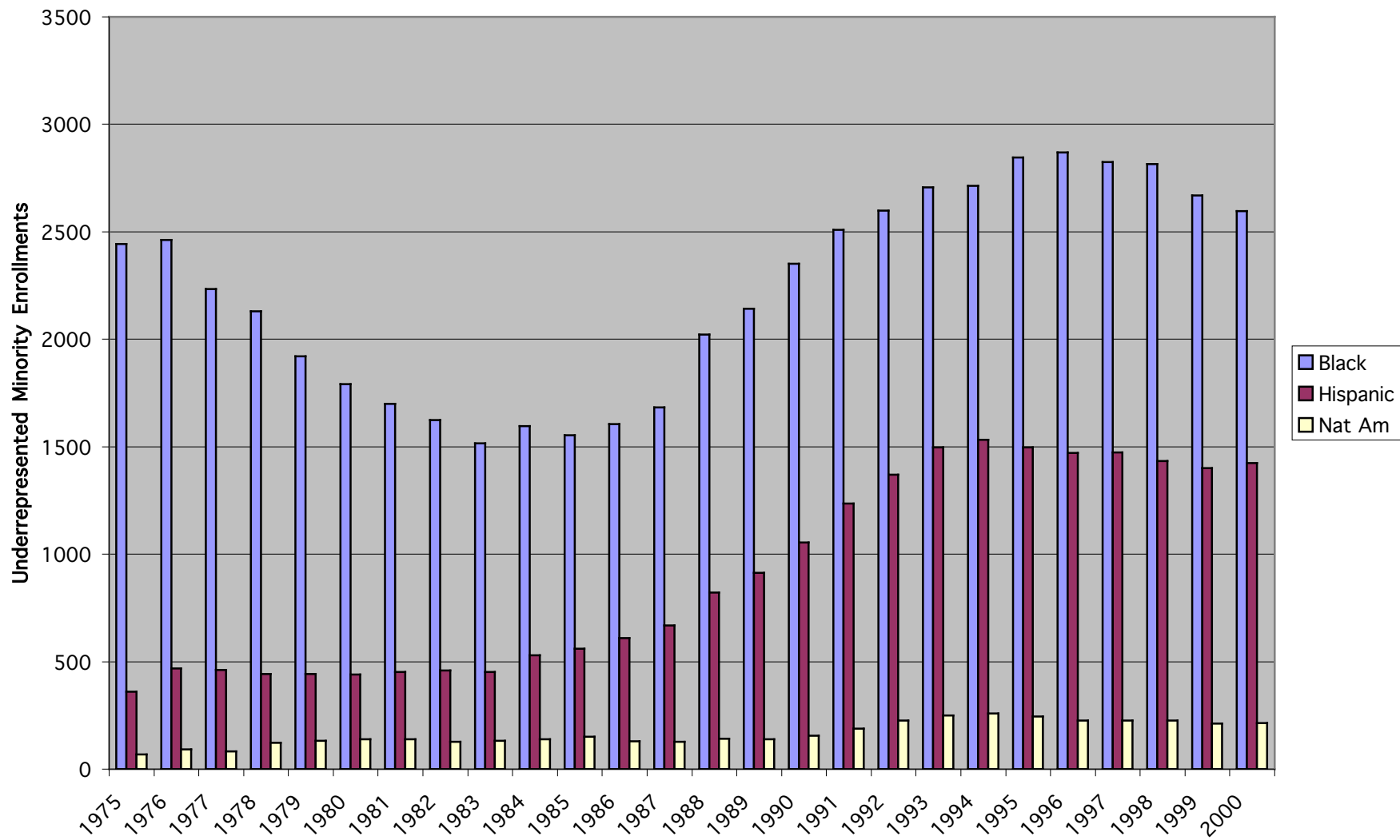
Chief Justice William Rehnquist issued the majority opinion in the College of Literature, Science, and the Arts (LSA) case, declaring that while existing affirmative action law established in the *Regents of the University of California v. Bakke* allows for race to be a factor in the admissions process, it must not be a "deciding factor." At issue, Justice Rehnquist wrote, is the point value given to minority applicants.

"Because the University's use of race in its current freshman admissions policy is not narrowly tailored to achieve respondents' asserted interest in diversity, the policy violates the Equal Protection Clause. For the reasons set forth in *Grutter v. Bollinger* . . . the Court has today rejected petitioners' argument that diversity cannot override a compelling state interest. However, the Court finds that the University's current policy, which automatically distributes 20 points, or one-fifth of the points needed to guarantee admission, to every single 'underrepresented minority' applicant solely because of race, is not narrowly tailored to achieve the interest in educational diversity that respondents claim justifies their program. . . . Moreover, unlike Justice Powell's example, where the race of a particular black applicant would be considered without being decisive . . . the LSA's 20-point distribution has the effect of making 'the factor of race . . . decisive for virtually every minimally qualified underrepresented minority applicant.'"

The Michigan Cases

- Litigation challenged our use of race as a factor in determining admissions.
- Took the cases all the way to the Supreme Court.
- In both decisions, the Supreme Court established the importance of diversity in higher education and reaffirmed that racial factors could play a role in achieving it.
- BUT, the war is not over, and we still have many battles to fight...including the possibility of a state initiative to modify the Michigan constitution this fall.

UAAA Underrepresented Minority Enrollments



What happened?

Why did minority enrollments drop so dramatically in 1997 and following years?

Did the high profile of the Michigan affirmative action cases discourage minority students from applying to the University?

Unlikely, since they began to drop before these cases were filed (and certainly long before they received high visibility).

Conjecture

Even as the University was launching the litigation strategy to defend the use of race in admissions that would lead to the Supreme Court decision, it was also consciously dismantling all of the earlier Michigan Mandate programs—outreach, financial aid, target of opportunity, keeping pressure on the deans, presidential leadership.

It is my view (and the view of many others) that it was the Michigan Mandate that led to the great success of the University of Michigan in achieving diversity, and it was the dismantling of these efforts that have caused the backsliding to today.

Global Sustainability

- There is compelling evidence that the growing population and invasive activities of humankind are now altering the fragile balance of our planet.
- The concerns are both multiplying in number and intensifying in severity: the destruction of forests, wetlands, and other natural habitats by human activities leading to the extinction of millions of biological species and the loss of biodiversity; the buildup of greenhouse gases such as carbon dioxide and their possible impact on global climates; the pollution of our air, water, and land.
- The challenge to your generation: how to provide for a human society that presently has outstripped the limits of global sustainability.

A particular challenge for the United States

- With just 4.5% of the world's people, we control 25% of its wealth and produce 25% to 30% of its pollution.
- It is remarkable that the richest nation on earth is the lowest per capita donor of international development assistance of any industrialized country.
- We are a nation that has difficulty in looking more than a generation ahead, encumbered by a political process that generally functions on an election-by-election basis, as the current debate over global change makes all too apparent.

The Challenge

- On a global basis, half of the world's population is under the age of 20, with over 2 billion teenagers on Planet Earth, most living Asia, Africa, and Latin America.
- Today there are over 30 million people who are fully qualified to enter a university, but with no place available. This will grow to over 100 million by the end of the decade.
- Unless we can address and solve this crisis, billions of people in coming generations will be denied the education so necessary to compete in and survive in an age of knowledge!

What can the United States do?

- Our current university models are ill-suited to this challenge.
- We continue to be focused on high-cost, low technology, residential campus-based education.
- And on the outmoded idea that quality in education is linked to exclusivity of access and extravagance of resources.
- A new paradigm of the university both “of the world and in the world” is needed!

Markets

- Could the emergence of new competitive forces (e.g., outsourcing), driven by changing societal needs, economic realities, and technology are likely to drive a massive restructuring of higher education.
- Recall the experiences of other economic sectors such as health care, banking, communications, and transportation.
- Some believe we are in the early stages of the formation of a global knowledge and learning industry!

Some realities

- There is no way that our current tax systems can support the massification of higher education required by knowledge-driven economies, in the face of other compelling social priorities (particularly the health care needs of the aging).
- While it is easy to start markets, it is very hard to stop them.
- We may be at a tipping point in which market forces overwhelm public policy in determining the future of our universities.

Warnings

- Darwinian Competition
- Commercialization of the Academic
- From Public Good to Private Benefit
- The Loss of Public Purpose

Darwinian Competition

- Universities compete with one another for students, faculty, federal research grants, private gifts, winning football teams, reputation, ...
- The booming equity market of the late 1990s has widened the gap between the very wealthy elite private universities (e.g., Harvard) and the rest of higher education.
- This has created a Darwinian ecosystem, in which the predators (Harvard) prey upon and devour the programs of the prey (Michigan, Wisconsin, etc.)

Commercialization of the Academy

- Aggressive efforts by universities and faculty to capture and exploit the soaring commercial value of intellectual property created by research.
- Stimulated by federal policies such as the Bayh-Dole Act, which allows university ownership.
- Beginning to impact values such as openness, academic freedom, and willingness to challenge the status quo.
- “A century of experience has demonstrated our inability to control commercialism in college sports. What makes us think we can do so with research?”

From Public Good to Private Benefit

- The old perspective: higher education is a “public good”, benefiting all of society and hence deserving of tax support.
- The new perspective: higher education is a “private benefit”, primarily to the students, who should pay for it.
- Public policy: shift from investing in institutions (appropriations) to investing in marketplace (vouchers or tax breaks)

Who pays? (And who should pay?)

At UM, since the state demands that tax dollars are to be used to support state residents, we have to charge private tuition to nonresident students:

Out-of-state: \$28,000

In-state: \$8,000

In theory, the state appropriation covers the \$20,000 discount, but today in reality it only covers about \$11,000 per Michigan student.

Where does the remaining \$9,000 come from? From the same discretionary funds we would normally use for need-based financial aid!

A regressive social policy

- Another interesting fact: the current average family income of UM undergraduates now exceeds \$100,000.
- Hence, by charging low tuition (less than the true state-discounted tuition, which should be double the current level), we are forced to reallocate funds that should be going into the financial aid to students with economic need.
- Put another way, the current low-tuition policy at public universities in most states (and in Michigan) amounts to a situation in which the poor subsidize the education of the rich, largely at the expense both of their taxes and their own opportunities for a college education.

What to do?

- Some public universities are moving to high-tuition, high financial aid models, in which all students pay fees closer to the true cost of their education, and financial aid is used to expand access to all, regardless of the ability to pay.
- Put another way, as state support declines, public universities will have no choice but to “privatize” their operations if they are to preserve both their quality and the access to their programs.

The Privately-Support Public University

- During the 1960s, 70% of UM's education budget was supported by state appropriation.
- Today, less than 12% of UM's education budget (and less than 8% of its total budget) is provided by the state.
- Put another way, over the past several decades, Michigan has evolved from a "state supported" to a "state assisted" to a "state related" to a "state located" university.

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- Actually today it remains only as a "state molested" university...

Environmental Scans

Today (Near Term, Today's Student)

Globalization	Transport + Commun Integrated Economies, Culture, Conflict	Implications
Demographics	Population Growth Baby-boomers vs. Global Teenager	Hypercompetitive, global, knowledge-driven economy Global disparity in wealth and power driving geopolitical conflict
Exponentiating Technologies	Info-bio-nano technology Complex systems	
Explosion of New Knowledge		Market forces dominating public policy Obsolescence of existing social institutions (e.g., nation-state)

Tomorrow (2020-2050, Tomorrow's Student)

Global Sustainability
Population growth to 8 - 10 billion
End of Fossil Fuels
Global Climate Change

Hypercompetitive, integrated, global economy
China, India, Eastern Bloc
Off-shoring

National/homeland Security
Terrorism vs. Freedom

Exponential Technologies

Possible surprises:
Human lifespan doubles (or pandemics)
Disappearance of work
Artificial intelligence ("mind children")
Contact

Michigan Challenges

Erosion of Traditional Economic Base
Low-skill jobs (outsourcing) and high-skill jobs (off-shoring)
No obvious candidate for future economic engine
Current culture hostile to innovation

Increasing obsolescence of social institutions—but resistant to change
Government, corporations, labor, education
Political system, public opinion

Structural budget obsolescence
Unfunded mandates (Medicaid, K-12, Corrections)
Obsolete tax system (irrelevant to a service economy)

Inadequate Michigan leadership
Sense of denial—hoping the past will return
Lack of vision—and inability to develop one
Clueless—today's political issues are meaningless
(gay marriage, affirmative action, pro-life)
Ill-considered—priorities are basically stupid
Detroit casinos, SUVs, Michigan football

Investments in higher education are
Woefully inadequate (lowest in Midwest)
Blatantly political (Merit Scholarship Program)
Tragically ill-considered (Low tuition + low support = low quality + low access)

Ideas

- Might compare this period to other transformations in the nation's history
 - 1776, Jefferson, new democracy
 - 1860, Land-Grant, industrial revolution
 - 1945, Cold War, massification
 - 2003, knowledge-driven global society
- Change:
 - Outsourcing blue-collar labor
 - Outsource high-tech services

Resource Mapping

- Present resources
 - K-12 schools
 - Higher education
 - Libraries, museums, other cultural resources
 - Workplace training programs
 - Informal education (4-H, Scouts, etc.)
- Other resources (and constraints)
 - Public policies
 - Funding resources

Demographics

- 10 million (8th nationally)
- Increased only 7% in 1990s (13% in U.S.)
- 25% of growth from foreign immigrants
- Brain drain: loss of 12% of 25 to 44 year olds (4th largest in nation)
- Loss of 4% of 18 to 24 year olds
- Michigan is aging rapidly.

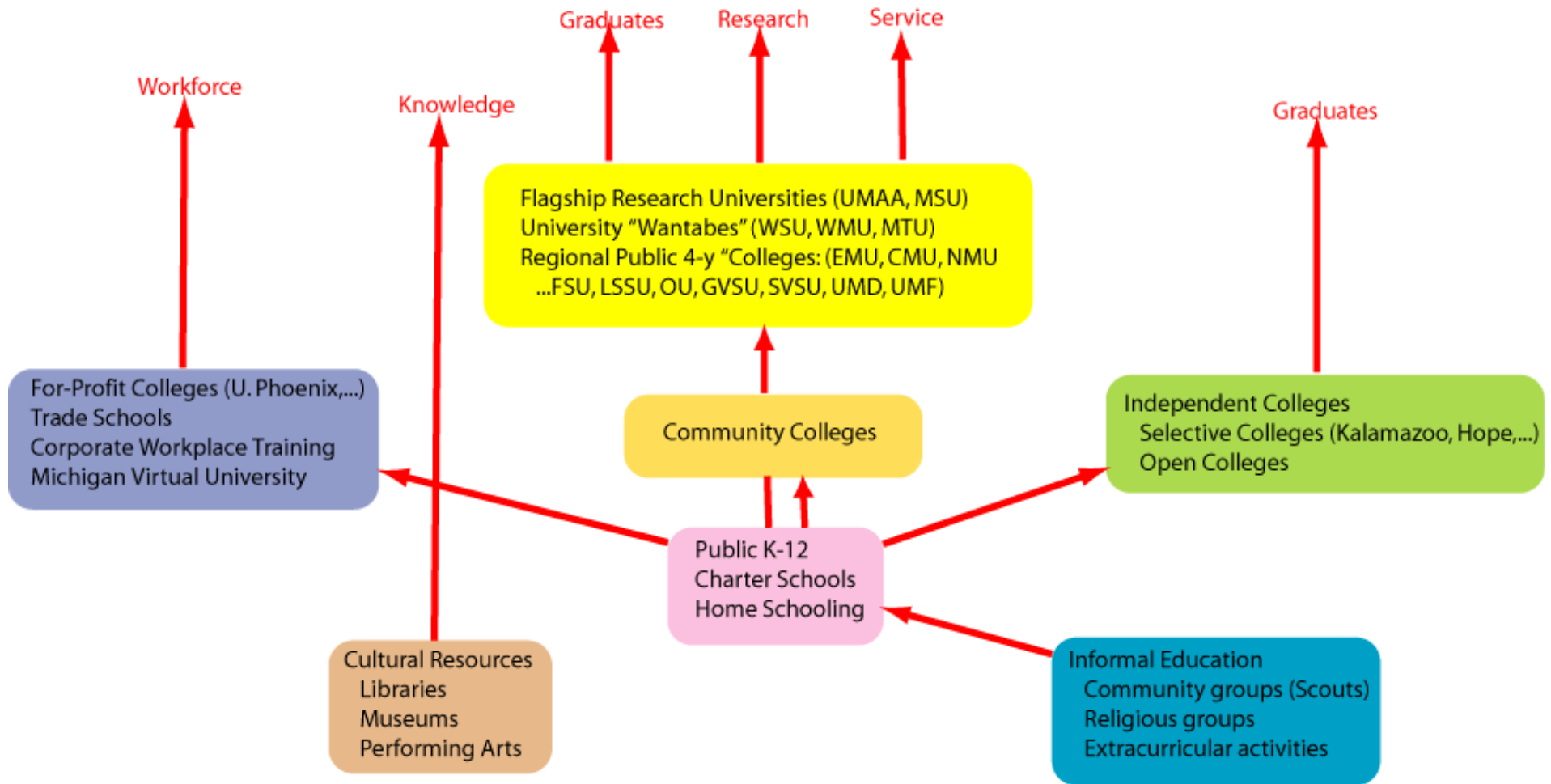
Michigan Economy

- \$308 billion (larger than Russia and Switzerland)
- Per capita income of \$30,296 just below national average (\$30,941); grew 12% slower than national average over past 25 years (4th worst in the nation)
- Thus far in 2004, Michigan ranks last in economic performance, losing more jobs than it is creating.
- Michigan is 3rd most dependent state on manufacturing, despite fact that most job growth has been in service jobs. Michigan lost 163,000 (out of 700,000) manufacturing jobs in the last three years.
- Michigan ranks 21st in knowledge-dependent service jobs, however.

Higher Education

- 15 public universities
- 50 independent colleges
- 29 community colleges
- 660,000 students
 - 4 y publics: 275,810
 - 2 y publics: 192,051
 - Privates: 98,436
 - (Peak in H.S. graduates in 2008, declining slightly thereafter until 2011.)

The Way We Are Now



NOTE: We need to get numbers for each of these sectors:

- 1) Number of students
- 2) Amount of public funding
- 3) Total amount of funding

Educational Performance

- 44% of Michigan adults have a literacy level too low to function in today's society.
- Serious regional and ethnics gaps.
- Only 73% of 9th graders will graduate from high school
- Only 32% of H.S. graduates are "college ready" (below national average)
- Less than 50% of college students will graduate
 - UM: 90%; MSU: 70%
 - All other publics at less than 50%!

Metrics for a Knowledge Society

- Only 22% have BA or advanced degrees (4% below U.S. average and 34th)
- Below national average in S&E degrees
- UM and MSU have capacity to attract S&E students from outstate, 55% of whom stay (but state discourages this).
- Most R&D is product development (automobile or pharmaceuticals)
- Michigan is at national average in academic R&D, but this is mostly due to UMAA.
- Michigan ranks last in venture capital (only 10% of national average).

Higher Education Policy

- Unusual constitutional autonomy
- No SHEEO (or state coordination)
- No private universities (although many quality liberal arts colleges)
- No real state higher education policy (at least at a strategic level)
- The funding of higher education has been a low priority of the state. Over the past 20 years, higher ed funding has increased by 30%; prison funding has increased by 300% and now is considerably larger than higher ed.

Educational Needs Assessment

- What skills and knowledge are necessary for individuals to thrive in the 21st Century knowledge society?
- What skills and knowledge are necessary for regional populations in a knowledge-driven global economy?
- How does a region produce the new knowledge (R&D) necessary to sustain its economy?

Possible futures of the university

- A new social contract
- The core-in-cloud university
- The university of the world...and in the world
- New civic lifeforms and learning ecologies
- The university a la Neuromancer

A New Social Contract

- Perhaps it is time for the social contract between the university and American society to be reconsidered and renegotiated.
- In an age of knowledge, perhaps it has become the responsibility of democratic societies to provide their citizens with the education and training they need, throughout their lives, whenever, wherever, and however they desire it, at high quality and an affordable cost!

Characteristics of the New U

- Learner-centered
- Affordable
- Lifelong learning
- A seamless web
- Asynchronous and ubiquitous
- Diverse

The “core-in-cloud” university

- Think Cambridge...
- A highly traditional university core
- Surrounded by a cloud of quasi-university organizations: corporate R&D labs, foundations, thinktanks
- The cloud can be geographically co-located (e.g., Palo Alto)
- It can also be “virtual” (based on cyberspace)

Universities of and in the world

- The realities of a global knowledge economy are driving some universities (and coalitions of universities) to expand beyond the bounds of their nation-states and into a global marketplace.
- They are accepting a far broader responsibility to understand and serve both the social needs and marketplace of the global community.
- But they may taken new forms (e.g., the Open University, Universitas 21, the University of Phoenix)

New civic lifeforms

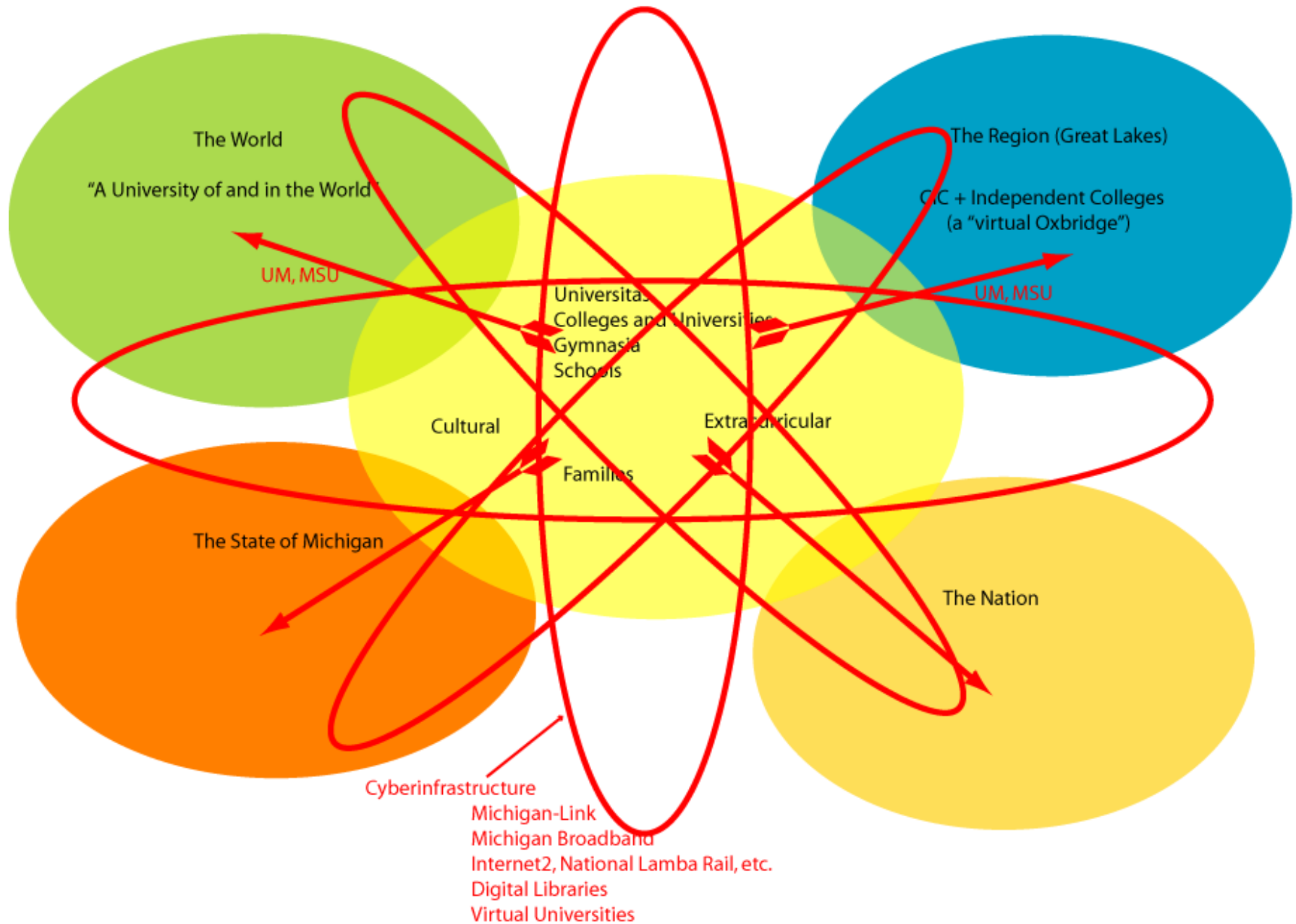
- Perhaps entirely new social structures will evolve for learning, that combine existing resources such as schools, universities, museums, media, and cultural institutions.
- A learning ecology, with organisms that mutate and evolve to serve the changing needs of a society.
- It has happened before, a century ago, when Andrew Carnegie created the public library as the social nexus for learning in communities.

The university a la Neuromancer

- Remember Moore's law, in which info (and bio-nano) technologies evolve exponentially at rates of 100 to 1,000 fold a decade
- Teachers replaced by software agents?
- Classrooms by virtual reality simulations?
- Neural implants? ("Fiber to the forehead")?
- Downloading neural patterns (a la Matrix)?
- The challenge would no longer be learning, but finding new knowledge to learn...

The Way We Should Be

A Digital "Catholepistimead" or "Society of Learning"



Gap Analysis: What Is Missing?

- New types of institutions?
- New providers?
- New resources (e.g., “teachers”)
- New linkages?
- New policies?
- New investments?
- New culture?

University Investment Commission

"For every problem facing Michigan—the need for high quality and affordable health care, strong K-12 student achievement, more and better paying jobs, environmental protection, agricultural productivity, and urban revitalization—public universities contribute to solutions through leadership, talented graduates, loan of academic talent, and research."

Glazer-Grimes Report

"These days the keys to economic success are a well-educated workforce, technical know-how, high levels of capital investment, and entrepreneurial zeal. If the U.S. (and Michigan) is to meet the challenge posed by a truly global economy, it will have to insure that its scientists are the most creative, its business leaders are the most innovative, and its workers are the most highly skilled—not easy when other nations (and other states) are seeking the same goals.

Yet...Michigan lags behind

In educational achievement:

- Our population is aging and our 25-44 year olds are leaving the state.
- Only one-third of K-12 graduates are college ready.
- Only 22% have bachelors degrees, a shortfall of 270,000 degrees.

There is growing evidence that a skilled worker shortage—created by low birthrates, out-migration of young adults, and poor performance of our educational systems—poses a serious threat.

In infrastructure...

- Ranking only 24th among states in deployed broadband
- And very last in ILEC per-line investments.
- Also lacking in any visionary public policy (instead wasting time and funding on wild goose chases such as giving all 6th graders laptop computers).
- Relying on the marketplace (e.g., SBC...which is headquartered in San Antonio) to provide connectivity.

In generating new knowledge...

- New jobs will be created by new knowledge and new activities (info-bio-nano, knowledge services, etc.)
- Private rate of return from R&D investments is 25% to 30%.
- Unfortunately, most industrial R&D in Michigan is in product development rather than basic research.
- While the state has two world-class research universities (and only can support two), they are funded at a level more typical of regional four-year colleges than research-graduate-intensive universities.
- And again chasing rainbows such as the Life Sciences Corridor.

Investments

- Michigan's support of higher education is the lowest among the Great Lakes states and ranks in the bottom third of the nation.
- Over past two years, state has cut \$260 million from higher ed budget (while exerting political pressure to cap tuitions).
- Michigan also lags far behind other states in providing state support of academic buildings (with no capital outlay program for almost a decade).

Public Policy?

- Higher education is a low priority.
- Rather than adequately funding higher education, Michigan prefers to attack its universities (e.g., tuition) of set empty goals such as "doubling the number of college graduates" with no strategy for funding this growth.
- Instead state politicians grasp at straws such as gambling, tax abatements for dying industries, or tax cuts (primarily benefiting the wealthy).

"State government treats its universities the way I treat my roof, putting off repairs to fund other desires, and waiting until the roof falls in before paying any attention to needs."

Public Attitudes

- Polling indicates that the public supports a greatly enhanced investment in education.
- They view education as the key to their economic future.
- They are not concerned with higher tuition (which they attribute to inadequate state support).
- But, as yet, state politicians do not recognize this sea change.

What to do?

The Cherry Commission:

- Preparation
- Participation
- Completion
- Economic Benefits

But still tinkering about the status quo...

Michigan's Challenge

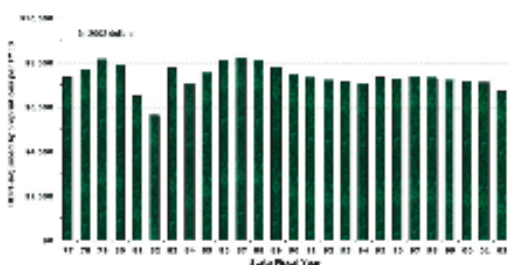
Michigan's future will depend increasingly on its ability to build, support, and sustain a system of public and private colleges and universities characterized by world-class quality; offering broad access to all citizens (including those from other states and nations); diverse in roles, missions, and other characteristics such as funding; and capable and committed to serving this state and its people in an intensely competitive, global, knowledge-driven economy.

A Roadmap for Michigan

- What?
 - A roadmap that provides a path to a learning ecology, i.e., one that evolves and adapts.
- For whom?
 - Governor? Head of nonprofit foundations?
 - Existing educational institutions?
 - Private sector?

The Present

Higher Education Price Index-adjusted state appropriations, per fiscal year, averaged \$1,000 per student for the aggregate of all state universities have been trending lower since FY 1987.



Michigan's Roadmap to A Society of Learning

The Near Term



The Long Term

The Way We Should Be

A Digital "Cathedralism" for "Society of Learning"



Near Term (Mostly Policies)

- To achieve and sustain quality and access, Michigan needs to move into the top quartile of states in its higher education appropriations per student.
- As powerful market forces increasingly dominate public policy, Michigan's higher education strategy should become market-smart, investing more directly in the marketplace through student grants rather than primarily in educational institutions or politically-driven initiatives such as the Michigan merit scholarship program that do little to enhance either access or quality.

Near Term (continued)

- Michigan should give the highest priority to investing limited tax dollars in need-based financial aid programs, which numerous studies have established as the most effective way to provide access to higher education since they target those most in need.
- Michigan should give far higher priority to investments in infrastructure—particularly technology such as broadband connectivity—that will support, link, and provide access to all educational resources in the state rather than simply in public institutions, including schools, colleges, universities, libraries, museums, and other knowledge and cultural resources.

Near Term (continued)

- If our academic institutions are to respond more nimbly to market forces, there is a need to negotiate a more strategic “social contract” between state government and its public universities, providing enhanced autonomy in return for greater (and visible) public accountability.

For the Longer Term

- Michigan needs to develop a far more systemic and strategic perspective of its educational and cultural institutions—both public and private—that recognizes that they comprise a learning ecology that must be allowed and encouraged to adapt and evolve rapidly to serve the needs of the state in a change driven world, free from micromanagement by state government or partisan politics.

For the Longer Term (continued)

- Michigan should strive to encourage and sustain a more diverse system of higher education, since institutions with diverse missions, core competencies, and funding mechanisms are necessary to serve the diverse needs of its citizens, while exhibiting as a system more resilience to the challenges presented by unpredictable futures.

For the Longer Term (continued)

- Serious consideration should be given to reconfiguring higher education by exploring new paradigms by launching experiments based on the best practices of other regions and nations. For example, the current segmentation of learning (e.g., primary, secondary, collegiate, graduate/professional, workplace) is increasingly irrelevant to a competitive world demanding continual learning to keep pace with the exponential growth in new knowledge.

For the Longer Term (continued)

- Using a combination of technology and funding policies, efforts should be made to link together all elements of Michigan's learning resources into a seamless web, centered on the needs of the learner rather than the ambitions of the institution (or their political advocates).
- While it is natural to confine state policy to state boundaries, in reality such geopolitical boundaries are of no more relevance to education policy than they are to corporate strategies in an ever more integrated and interdependent global society. Hence strategies must broaden to include regional, national, and global elements.

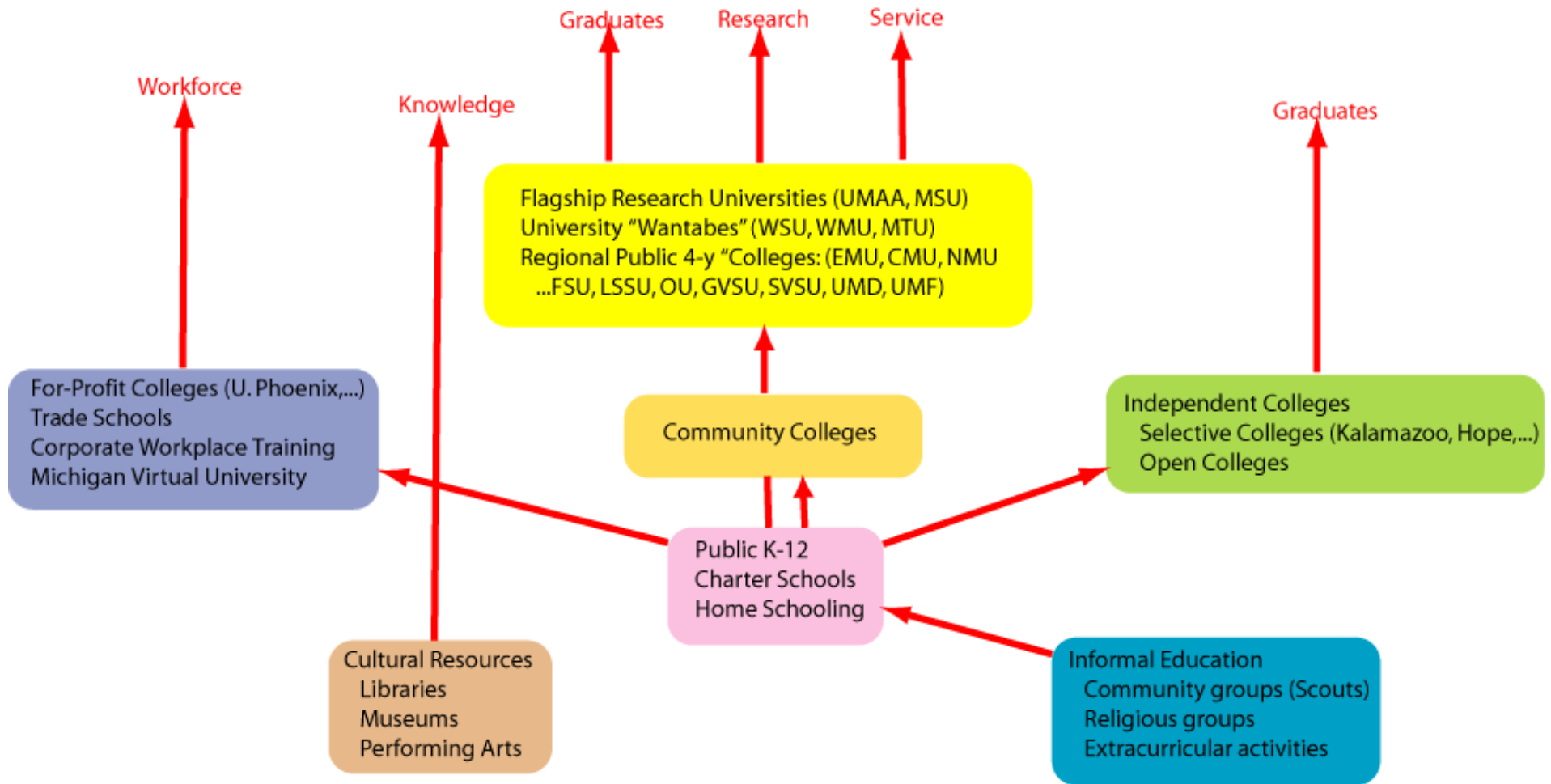
For the Longer Term (continued)

- Perhaps most important, we believe that in order to compete economically with other regions (states, nations), Michigan should develop a “G.I. Bill II”, that provides—indeed, guarantees—all of its citizens access to ubiquitous, high quality, diverse learning opportunities throughout their lives, and adapting to their ever-changing needs.

For the Longer Term (continued)

- Key to Michigan's economic prosperity will be the development of a global presence, not simply to build global markets for Michigan products and services, but as well to attract talent to our state from around the world. To this end, Michigan should encourage the formation and evolution of a "university of the world and in the world", most logically drawing on the vast experience and capability of UMAA and MSU.

The Way We Are Now

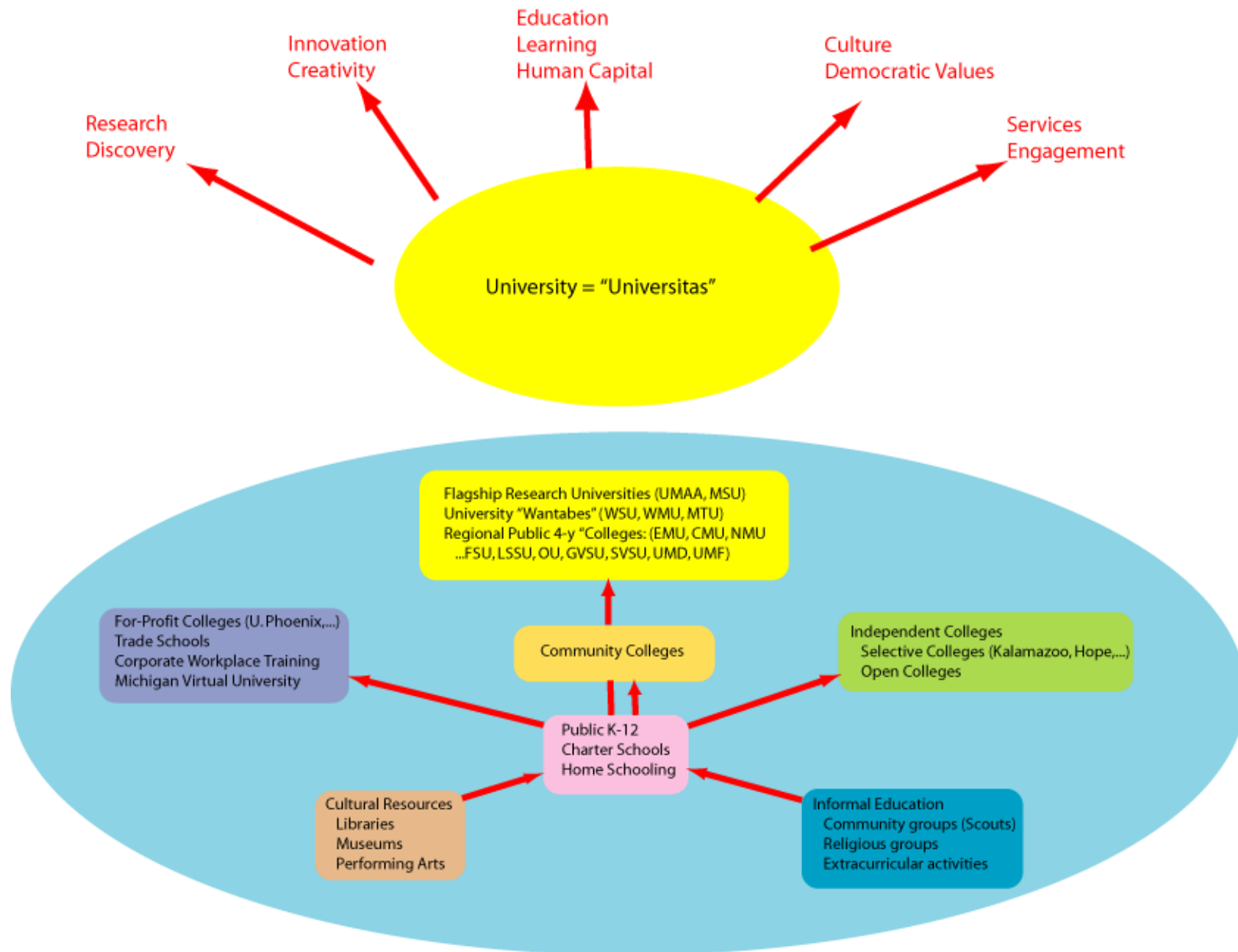


NOTE: We need to get numbers for each of these sectors:

- 1) Number of students
- 2) Amount of public funding
- 3) Total amount of funding

A university is a community of masters and scholars (universitas magistorium et scholarium), a school of universal learning (Newman) embracing every branch of knowledge and all possible means for making new investigations and thus advancing knowledge (Tappan).

→
 "A Catholepistemiad for the 21st Century"
 "A Society of Learning"
 "A Knowledge Net"
 "A Learning Ecology"

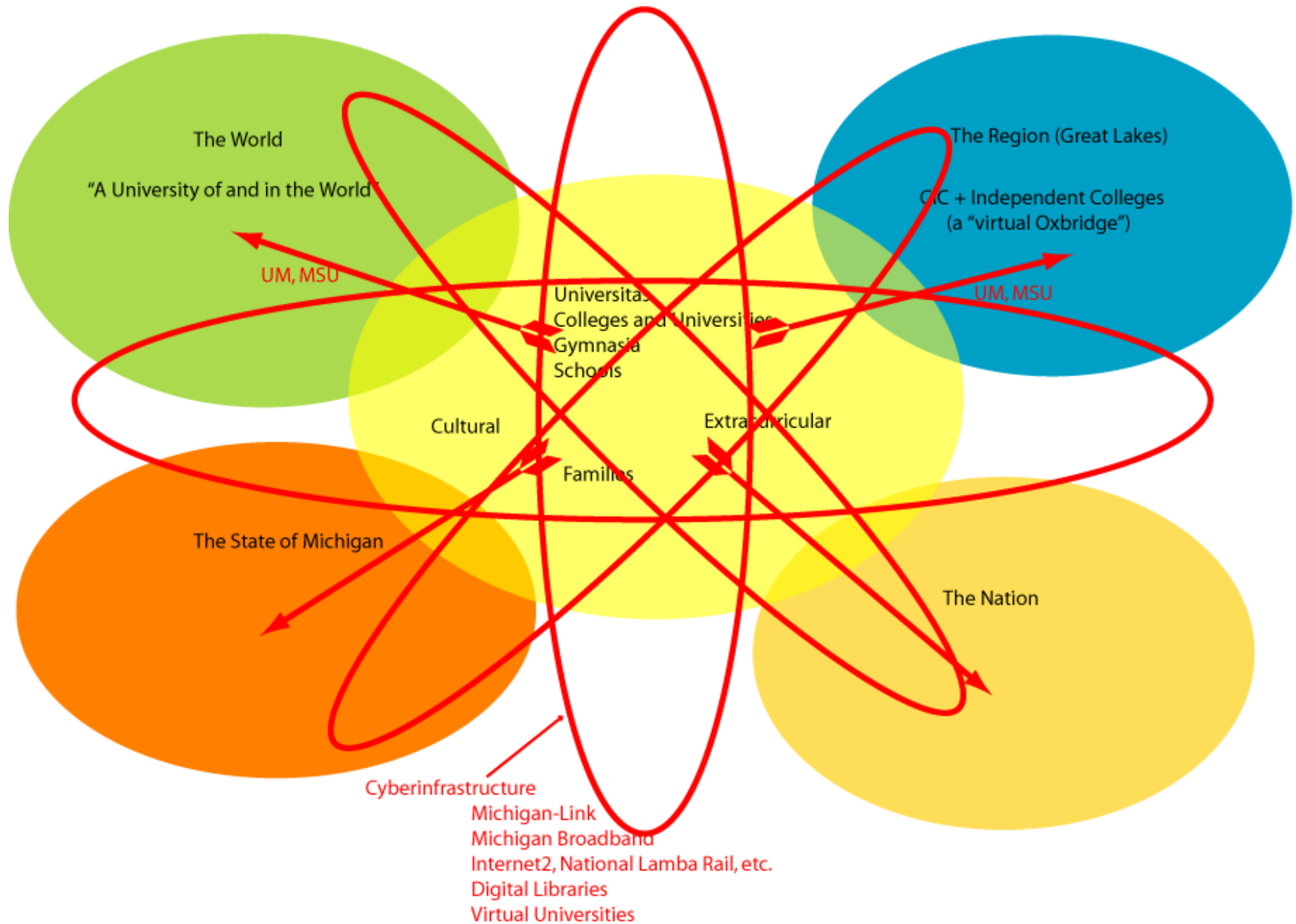


For the Longer Term (continued)

- The quality and capacity of Michigan's learning and knowledge infrastructure will be determined by the leadership of its two flagship universities, UMAA and MSU, in discovering new knowledge, developing innovative applications of these discoveries that can be transferred to society, and educating those capable of working at the frontiers of knowledge and the professions. In this sense, UMAA and MSU might be encouraged to evolve more toward a "universitas" concept, stressing their roles as sources of advanced knowledge and learning rather than general education at the collegiate level.

The Way We Should Be

A Digital "Catholepistimead" or "Society of Learning"



Recommendations

The Near Term

Today's Challenge: Michigan investments in higher education are:
...woefully **inadequate**
...blatantly **political**
...tragically **ill-considered**

Key Vision:
To invest more adequately, strategically, and intelligently.

Investment Goals: ...quality ...access ...diversity ...market-smart	Guiding Principle: "An uncommon education for the common man" James Angell, 1881
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The Elements:

1. Bringing Michigan's state appropriation per FYES student to the top quartile nationally.
2. Placing a higher priority on investments in infrastructure that link together learning resources and people.
3. Investing more in the marketplace, in students, and less in institutions, BUT doing so through need-based financial aid rather than merit grants or low tuition that put at risk both quality and access.
4. Encouraging a highly diverse educational system with a better balance of public and private institutions.
5. Negotiate a social contract providing the institutional autonomy, tempered by public accountability, necessary to flourish in a market-driven environment.

The Longer Term

Tomorrow's Challenge: To provide all of Michigan's citizens with the education and training they need, throughout their lives, whenever, wherever, and however they desire it, at high quality, and at an affordable cost.

Key Vision: To build a "society of learning," a learning ecology, capable of responding to the imperatives of a 21st century, global, knowledge-driven society.

Goal: A "learning ecology," capable of adapting and evolving rapidly to provide learning opportunities and knowledge during a period of extraordinary change.

The Elements:

1. A "G.I. Bill II" providing all Michigan citizens with lifelong learning.
2. Stimulating the formation of a true "learning ecology".
3. Developing a regional, national, and global strategy.
4. Reconfiguring K-16 to provide lifelong learning opportunities.
5. Linking together all elements of Michigan's learning resources into a "seamless web".
6. Move toward more regional configurations (e.g., Great Lakes).
7. Providing UMAA and MSU with the mandate to join together to build a "university of and in the world".
8. Enable UMAA and MSU to evolve into a true universitas, stressing their roles as sources of advanced knowledge and learning rather than general education at the "collegiate" level.

Broader issues

The **process** is more important than the product, since roadmapping might provide a template for other regions (and nations).