

The Michigan Virtual Automobile College

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One of the more provocative approaches to higher education in the information age is the so-called *virtual university*. In cybertalk, “virtual” is an adjective that means existing in function but not in form. A virtual university exists only in cyberspace, without a campus or perhaps even a faculty. Sophisticated networks and software environments are used to break the learning loose from the constraints of space and time and make it available to anyone, anyplace, at any time.

Already college directories list over 700 virtual colleges, with over a million students enrolled in their programs. Yet most of these are simply Internet-based extensions of conventional distance learning, relying upon existing higher education organizations such as extension programs. However, there are also several rapidly emerging virtual organizations such as the Western Governor’s University and the California Virtual University that do represent radical departures from our traditional paradigms for colleges and universities. In this paper, we describe the design, formation, and rapid growth of one of the first of these new virtual colleges, the *Michigan Virtual Automotive College (MVAC)*.

To respond to the changing educational needs of a major industry in our state, the automobile industry, as well as to explore the possibility of new types of learning institutions based upon rapidly emerging digital technology, in 1996, the State of Michigan launched the Michigan Virtual Automotive College. This is a collaborative effort among the University of Michigan, Michigan State University, the State of Michigan, the state’s other colleges and universities, and the automobile industry. It was formed as a private, not-for-profit, 501(c)3 corporation aimed at developing and delivering technology-enhanced courses and training programs for the automobile industry.

MVAC was designed as a system integrator, a broker, between colleges and universities, training providers, and the automotive industry. It works to facilitate certificate and degree attainment for those participating in courses and training programs offered under its auspices. It is designed as a “green field” experiment where colleges and universities can come together to test capabilities to deliver their training and educational programs at a distance and asynchronously. It is also expected to serve eventually as a platform for the State of Michigan to build an education export industry.

MVAC is a college without walls. Courses and programs can be offered from literally any site in the state to any other technologically connected site within the state, the United States, or the world. Although learning technologies are rapidly evolving, MVAC currently brokers courses which utilize a wide array of technology platforms including satellite, interactive television, Internet, CD-ROM, videotape, and combinations of the above. MVAC will seek to develop common technology standards between and among providers and customers for the ongoing delivery of courses. MVAC offers courses and training programs, ranging from the advanced post-graduate education in engineering, computer technology, and business administration to entry level instruction in communications, mathematics, and computers.

MVAC has made considerable progress in its first year. After the negotiation of a governance structure and the development of a business plan in summer and fall of 1996, MVAC was formally incorporated in December, 1996. Capitalization for MVAC is provided by members of the partnership: the State of Michigan (\$5 million), the universities (\$2 million), and an as-yet-to-be-determined contribution from the automobile industry. A staff was recruited and facilities were developed in Ann Arbor. Commitments to participate in the evolution of MVAC were obtained from all of the key members of the executive committee, including the leadership of the Big Three, the presidents of Michigan's colleges and universities, and key suppliers. Extensive market studies were performed, both through the use of MVAC marketing staff and through the use of consultants (Coopers & Lybrand). Based on this market survey, a request for proposals was distributed to higher education institutions for the development of courses for fall of 1997. MVAC currently offers sixty to seventy courses and over 20 degree programs across a broad spectrum of disciplines and levels.

This paper is intended to describe the rationale behind MVAC, our strategic plan, our execution, and what we have learned.

The Rationale

There were two issues that stimulated MVAC. First, a study commissioned by the State of Michigan's Automotive Partnership and performed by the University of Michigan's Office of Studies in Automotive Transportation concluded that the education and training needs of the automobile industry could no longer be met by conventional in-house training programs or established educational institutions. Both the combination of workforce turnover through retirements, coupled with the increasing skill and education levels required for future jobs in this industry, suggested that over 130,000 jobs would be at stake in Michigan alone over the next decade.

Existing higher education paradigms, based primarily on campus-based classroom learning, were limited in their capacity to respond to this need. Therefore, Michigan's Governor, John Engler challenged the state's universities to take advantage of emerging information technology to deliver educational services and training opportunities into the workplace of the state's automobile industry through a virtual university paradigm.

The University of Michigan, Michigan State University, and the Michigan Jobs' Commission formed a partnership to design and build such a learning institution. Michigan State University, as the state's land-grant institution, had long experience in delivering distance-independent learning through its extension programs. The University of Michigan had considerable expertise in information technology. And the Michigan Jobs' Commission could play a critical role both in providing the necessary startup funding and through its experience in providing assistance for training programs to the automobile industry.

However, even as this highly specific venture was launched, there was also recognition that it might well serve as a template for new learning institutions more capable of responding to the rapidly changing educational needs of the state.

A Broader Context

From a broader perspective, the Michigan Virtual Automotive College was viewed as a laboratory to address three of the most significant challenges facing higher education in America: i) financial imperatives, ii) changing social needs, and iii) technology drivers.

Financial Imperatives

Since the late 1970s, higher education in America has been caught in a financial vise.¹ On the one hand, the services demanded of our colleges and universities continue to increase. Enrollments have grown steadily; the growing educational needs of adult learners have compensated for the temporary dip in the number of high school graduates associated with the post-war baby boom/bust cycle. University research, graduate education, and professional education have all grown in response to societal demand. Professional services provided by colleges and universities also continue to grow in areas such as health care, technology transfer, and extension—all in response to growing needs.

Yet, the costs of providing education, research, and service have grown at an even faster rate, since these university activities are dependent upon a highly skilled, professional workforce (faculty and staff); they require expensive new facilities and equipment; and they are driven by an ever-expanding knowledge base. Higher education has yet to take the bold steps to constrain cost increases which have been required in other sectors of our society such as business and industry. This is in part because of the way our colleges and universities are organized, managed, and governed. But, even if our universities should acquire both the capacity and the determination to restructure costs radically, it is debatable whether those industrial sector actions designed to contain cost and enhance productivity could have the same impact in education. The current paradigm of higher education is simply too people- and knowledge-intensive.

Societal Needs

Significant expansion of higher education will be necessary just to respond to the needs of a growing population which will create a 30 percent growth in the number of college-age students over the next decade. But these traditional students are only part of the picture; we must recognize the impact of the changing nature of the educational services sought by our society.

Today's undergraduate student body is no longer dominated by eighteen to twenty-two year-old high school graduates from affluent backgrounds. It is comprised also of increasing numbers of adults from diverse socio-economic

backgrounds, already in the workplace, perhaps with families, seeking the education and skills necessary for their careers. When it is recognized that this demand for higher education may be significantly larger than that for traditional undergraduate education, it seems clear that either existing institutions will have to change significantly or new types of institutions will have to be formed. The transition from student to learner, from faculty-centered to learner-centered institutions, from teaching to the design and management of learning experiences, and from student to a lifelong member of a learning community—all suggest great changes are ahead for our institutions.

Technology Drivers

As knowledge-driven organizations, colleges and universities are greatly affected by the rapid advances in information technology—computers, telecommunications, networks. This technology has already had dramatic impact on campus research activities, including the creation of an entirely new form of research: computer simulation of complex phenomena. Many of our administrative processes have become heavily dependent upon information technology—as the current concern with the approaching date reset of Y2K has made all too apparent. There is an increasing sense that new technology will have an even more profound impact on the educational activities of the university and how we deliver our services. To be sure, there have been earlier technology changes such as television, but never before has there been such a rapid and sustained period of technological change with such broad social applications.

Most significant here is the way in which emerging information technology has removed the constraints of space and time. We can now use powerful computers and networks to deliver educational services to anyone at anyplace and anytime, confined no longer to the campus or the academic schedule. The market for university services is expanding rapidly, but so is competition, as new organizations such as virtual universities and "learning-ware" providers enter this marketplace to compete with traditional institutions.

The Changing Nature of the Higher Education Enterprise

Universities have long enjoyed a monopoly over advanced education because of geographical location and their monopoly on certification through the awarding of degrees. Yet this carefully regulated and controlled enterprise could be blown apart by several factors. First, the great demand for advanced education and training simply cannot be met by such a carefully rationed and controlled enterprise. Second, the expanding marketplace will attract new competitors, exploiting new learning paradigms, and increasingly threatening traditional providers. Perhaps most important of all will be the impact of information technology, which will not only eliminate the constraints of space and time but will create open learning environments in which the learner has choice in the marketplace.

More specifically, tomorrow's student will have access to a vast array of learning opportunities, far beyond the faculty-centered institutions characterizing higher education today. Some will provide formal credentials, others will provide simply knowledge, still others will be available whenever the student—more precisely, the learner—needs the knowledge. The evolution toward such a learner-centered educational environment is both evident and irresistible.

As a result, higher education is likely to evolve from a loosely federated system of colleges and universities serving traditional students from local communities into, in effect, a knowledge and learning industry. Since nations throughout the world recognize the importance of advanced education, this industry is global in extent. With the emergence of new competitive forces and the weakening influence of traditional regulations, higher education is evolving like other “deregulated” industries, e.g., health care or communications or energy. In contrast to these other industries, which have been restructured as government regulation has disappeared, the global knowledge industry will be unleashed by emerging information technology that releases education from the constraints of space, time, and credentialing monopoly. As our society becomes ever more dependent upon new knowledge and educated people, upon knowledge workers, this global knowledge business must be viewed clearly as one of the most active growth industries of our times.

While many in the academy would undoubtedly view with derision or alarm the depiction of the higher education enterprise as an “industry” or “business,” operating in a highly competitive, increasingly deregulated, global marketplace, this is nevertheless an important perspective that will require a new paradigm for how we think about postsecondary education. Furthermore, it is clear that no one, no government, is in control of the higher-education industry. Instead it responds to forces of the marketplace.

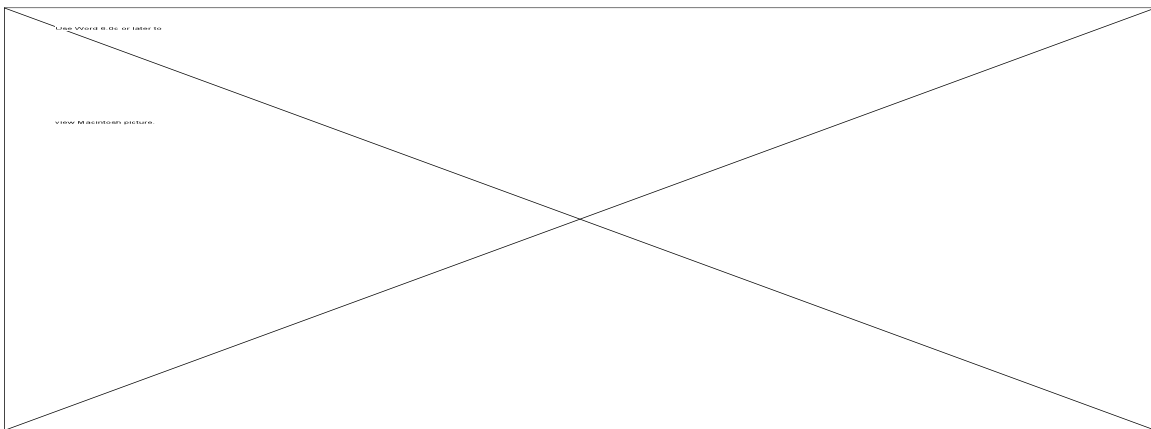
Will this restructuring of the higher education enterprise really happen? If you doubt it, just consider the health care industry. While Washington debated federal programs to control health care costs and procrastinated taking action, the marketplace took over with new paradigms such as managed care and for-profit health centers. In less than a decade the health care industry was totally changed. Today, higher education is a \$180 billion a year enterprise. It will almost certainly be “corporatized” similarly to health care. By whom? By state or federal government? Not likely. By traditional institutions such as colleges and universities working through statewide systems or national alliances? Also unlikely. Or by the marketplace itself, as it did in health care, spawning new players such as virtual universities and for-profit educational organizations? Perhaps. Just note a brief passage from a recent venture capital prospectus analyzing possible investments in education²:

“As a result, we believe education represents the most fertile new market for investors in many years. It has a combination of large size (approximately the same size as health care), disgruntled users, lower utilization of technology, and the highest strategic importance of any

activity in which this country engages Finally, existing managements are sleepy after years of monopoly.”

As we examine the experience of other restructured industries, one of the first trends we notice is unbundling, that is, the vulnerability of vertically integrated organizations to competition from new companies that focus on providing only few of the traditional services. The modern university has just such a vertically integrated structure. It provides courses at the undergraduate, graduate, and professional level; supports residential colleges, professional schools, lifelong learning, athletics, libraries, museums, and entertainment. The university has assumed responsibility for all manner of activities beyond simply education—housing and feeding students, providing police and other security protection, counseling and financial services . . . even power plants on many midwestern campuses!

The most significant impact of a deregulated higher education “industry” will be to break apart this monolith, much as other industries have been broken apart through deregulation. As universities are forced to evolve from faculty-centered to learner-centered, they may well find it necessary to unbundle their many functions, ranging from admissions and counseling to instruction and certification. In fact, we might anticipate that each of the activities in the supply chain of educational services from providers to learners could be unbundled and conducted by separate organizations.



Already both conventional publishers and “edutainment” companies are moving into the production arena. In a sense, virtual universities” represent organizations that focus on marketing and delivery of educational services. Companies such as Sylvan Learning are moving aggressively into the assessment arena. And we may soon see the emergence of new organizations that focus on credentialing learning.

Clearly higher education is an industry ripe for the unbundling of activities. Universities, like other institutions in our society, will have to come to terms with what their true strengths are and how those strengths support their strategies—and then be willing to outsource needed capabilities in areas where they do not have a unique competitive advantage.

INSERT HERE A BRIEF DESCRIPTION OF SOME OF THE NEWLY EMERGING EDUCATIONAL COMPANIES...

*WGU
Phoenix
Nova
UK Open University*

The Key Decisions in Forming MVAC

As the above examples illustrate, there are many different approaches to building virtual universities. Clearly, all depend upon information technology to free themselves from the constraints of campus-based instruction. But they can differ considerably in the way they are financed, their governance, their markets, and their academic objectives.

As we examined a variety of different models for MVAC, we finally settled on the following characteristics:

First, we designed to be MVAC to be primarily a broker or system integrator, working with the industry to determine its education and training needs, and then, in turn, working with established educational institutions to respond to these needs through the use of information technology. In this sense, MVAC would have no campus, no faculty, and a very limited administrative staff. Its primary function would be to open up new channels for the delivery of educational services.

At the outset, we also decided that MVAC would not give degrees. Although there had been some early thought given to chartering MVAC as a state educational institution, in the end we decided against this. We wanted MVAC to be clearly perceived by Michigan's existing colleges and universities as value-adding, not competitive. Rather than creating an independent degree-granting capability—and facing the rather considerable challenges of accreditation—we instead decided to rely upon the established degree programs and cooperative agreements of existing institutions.

Second, we initially focused MVAC on a brokering role between institutions. That is, we viewed our initial market as companies, not individual employees or citizens. Furthermore, we viewed our suppliers as academic institutions, not individual faculty or staff. While we realized that at some future point, as we developed capacity to deliver high quality, cost-effective educational services beyond the workplace and onto the desktop and into the home, the possibility of offering programs to individual clients might become of interest. However at the outset, by confining our efforts to working with companies and academic institutions, we greatly simplified our marketing and support activities.

Third, we decided to form MVAC as a non-for-profit, independent corporation. While a for-profit organization would probably have been capable of faster growth because of access to capital markets, we believed that the non-for-profit character would better allow us to form relationships with colleges and universities. And while some state support was provided as to capitalize and launch MVAC, it is our intent that the operation be self-supporting based on educational fees and contracts within three years.

Finally, we believed that the governance structure of MVAC should clearly reflect the three key participants: Michigan's colleges and universities, the automotive industry, and the State of Michigan. Although the University of Michigan, Michigan State University, and the State of Michigan were founding members of the 501(c)3 membership corporation, we formed an executive committee structure containing representatives from Michigan's other universities and community colleges, the Big Three, the supplier industry, and the UAW.

The Learning Curve

INSERT A SECTION HERE SUMMARIZING THE KEY STEPS MVAC HAS TAKEN OVER THE PAST YEAR, INCLUDING:

*Institutional agreements
Market analysis
Business plan
Capitalization
Outsourcing
Particular challenges*

Next Steps

Even though MVAC has been in operation for only a year, there are already strong pressures within the state to establish similar industry-specific virtual colleges to respond to the needs of the states other economic sectors. The MVAC model is being considered as the template for virtual colleges focused on industries such as health-care products, furniture, tourism, and plastics. These are envisioned as "mirror sites", making extensive use of experience of MVAC, including administration, contracting, technology platforms, and academic services.

There has also been considerable interest expressed in extending the concept to include the delivery of educational services directly to individuals. Clearly with digital convergence—the merging of the television and the network computer—it will soon be possible to deliver sophisticated educational services directly into the home. The goal of making the vast resources of Michigan's educational infrastructure, its colleges and universities and cultural organizations, available

to all of the state's citizens, wherever they are and whenever they desire them, at high quality, and at a cost they can afford, is a dream that may soon be within reach. To this end, the Governor has already proposed forming a new state university—a "Michigan Electronic University"—that would not only coordinate the various industry-specific virtual colleges such as MVAC, but would assist the state's colleges and universities in providing a broader array of educational services based on information technology.

Of course, beyond administrative, financial, and technological issues, there are important pedagogical issues to consider. For many years universities have utilized passive telecommunications technology such as television to extend teaching to people unable or unwilling to attend campus-based classes. In its simplest form, such distance learning is really a "talking heads" paradigm, in which faculty lectures are simply delivered at a distance, either through live transmission or videotape. There have been efforts to broadcast such instruction through "sunrise semesters," augmented by written correspondence. A more effective approach utilizes on site teaching assistants to work directly with the students. Recently, technology has allowed the use of feedback via electronic mail, chatrooms, or two-way video interaction.

The simplest conception of the virtual university uses multimedia technology via the Internet to enable distance learning. Such instruction could be delivered either into the workplace or the home. In one form, this Internet-mediated instruction would be synchronous—in real time with the instructor and the students interacting together. The more interesting teaching paradigms of the virtual university involve asynchronous interactions, in which students and faculty interact at different times. In a sense, this latter form would resemble a correspondence course, with multimedia computers and networks replacing the mailing of written materials.

The initial driving force behind the formation of virtual universities is related both to cost and market. By using an inexpensive delivery mechanism such as the Internet to reach a potentially vast audience, many hope that a virtual university can provide instruction at costs far lower than campus-based instruction. There are presently for-profit entities³ competing directly with traditional colleges and universities in the higher education marketplace through virtual university structures.

Distance learning based on computer-network-mediated paradigms allows universities to push their campus boundaries out to serve learners anywhere, anytime. Those institutions willing and capable of building such learning networks will see their learning communities expand by an order of magnitude. In this sense, the traditional paradigm of "time-out-for-education" can be more easily replaced by the "just-in-time" learning paradigms, more appropriate for a knowledge-driven society in which work and learning fuse together.

Concluding Remarks

The forces driving change in our society and its institutions are stronger and more profound than many educators realize. The future was becoming less certain as the range of possibilities expands to include more radical options.

No one knows what this profound alteration in the fabric of our world will mean, both for learning and for our entire society. As William Mitchell, Dean of Architecture at MIT, stresses, "the information ecosystem is a ferociously Darwinian place that produces endless mutations and quickly weeds out those no longer able to adapt and compete. The real challenge is not the technology, but rather imagining and creating digitally mediated environments for the kinds of lives that we will want to lead and the sorts of communities that we will want to have."⁴ It is vital that we begin to experiment with the new paradigms that this technology enables

We believe that in a world of such rapid and profound change, facing a future of such uncertainty, the most realistic near-term approach is to explore possible futures of the university through experimentation and discovery. Rather than continue to contemplate possibilities for the future through abstract study and debate, it seems a more productive course to actually build prototypes of future learning institutions as working experiments. In this way we can actively explore possible paths to the future.

The Michigan Virtual Automotive College is one of these early experiments designed to better understand the future of higher education.

¹ Joseph L. Dionne and Thomas Kean, *Breaking the Social Contract: The Fiscal Crisis in Higher Education*, Report of the Commission on National Investment in Higher Education (Council for Aid to Education, New York 1997).

² Moe, Michael T., R. Keith Gay, and Jodi C. Nelson, "The Emerging Investment Opportunity in Education (San Francisco, Montgomery Securities, 1996) pp. 4 - 12

³ The University of Phoenix, <http://www.uophx.edu/online/>

⁴ Mitchell, William J., *City of Bits: Space, Place, and the Infobahn* (M.I.T. Press, Cambridge, 1995) Website: http://www-mitpress.mit.edu/City_of_Bits/