

Prospectus

Proposal Summary

The *Millennium Project* at the University of Michigan is a small research center that has supported my studies of the future of the university in America through various research projects as well as through the development of actual prototypes of future learning environments and institutions. This prospectus is intend to explore broadening the themes of our various studies by transforming the Millennium Project into a center for the conduct of “over-the-horizon” futures scanning activities, drawing together visionary experts from a broad array of fields and experiences to launch and lead efforts to understand the forces that will shape the future of our state and our society. In particular, the proposed research center would

- Identify technological, economic, and social forces that could drive major change in our state, nation, and world.
- Launch or stimulate research projects capable of analyzing these forces, developing broader awareness of their potential impact, and recommending and shaping appropriate strategies and public policies.

This brief prospectus seeks to determine possible interest on the part of Michigan foundations in providing either broad sustaining support for the Millennium Project or sponsoring one of its specific projects.

The Millennium Project

The original mission of the Millennium Project was to explore possible futures of the university through experimentation and discovery. Rather than simply contemplating possibilities for the future through abstract study and debate, the aim has been to explore actively possible paths to the future by building prototypes of future learning institutions as working experiments. The Millennium Project was located in the Media Union, a major new academic complex designed to explore the impact of information technology on learning. Rather than being simply a “think-tank”,



The Millennium Project in the University of Michigan Media Union

where ideas were generated and studied, the Millennium Project is a “do-tank”, where ideas can lead to the actual creation of working models of the future. Through an array of research projects and prototype development, it has attempted to sense, understand, and communicate broad trends and themes likely to affect the future of the university.

Many of these original objectives have been achieved during the past several years. The Millennium Project played an important role in the design and launch of Michigan’s first virtual university, the Michigan Virtual Automotive College and then assisted in its evolution into the Michigan Virtual University. It created an online academy, CyberCamp, to enable K-12 students to learn the powerful tools of information technology. It is utilizing virtual reality tools to explore new types of pedagogy in higher education in areas ranging from engineering to history to art. More recently, it has stimulated the development of an alliance between the University of Michigan, Oberlin College, and Kalamazoo College designed to demonstrate how liberal arts colleges and research universities can build strong linkages that jointly benefit their faculties and students. It has also supported the National Academy of Sciences study concerning the impact of information technology on the future of the research university.

The Millennium Project has stimulated a number of key papers, policy documents, and books on the future of higher education and the American research enterprise. (For more details, see the website <http://milproj.ummu.umich.edu>.)

The Proposed Center for “Over-the-Horizon” Futures Scanning

It is my intent to redirect the Millennium Project to identifying a number of broader technological, economic, and social forces likely to drive major change in our society, launching research projects to better understand these forces and their potential impact, and develop strategies and policies for both the public and private sector to address and shape possible futures. Topics of particular interest that relate well to my background and current activities include:

Education: As we enter an age of knowledge, in which educated people and their ideas become the keys to economic prosperity, national security, and social well-being, the development of intellectual capital is rapidly becoming the nation’s domestic priority. Yet it is becoming increasingly clear that our current education infrastructure (e.g., schools, colleges, universities, workplace training programs) are not sufficient to serve our growing educational needs. New types of educational institutions, programs, and policies are needed to address the lifetime learning needs of citizens in a society of learning.

Background: Experience as former university president, member and former chair of the National Science Board, founder of Michigan Virtual Automotive College, member of Advisory Committee of Educational and Human Resources Directorate of National Science Foundation, chair of National Academy of Sciences project concerning the impact of technology on higher education, and member of the NAS Committee on Science, Engineering, and Public Policy (COSEPUP).

Diversity, Demographics, and the Digital Divide: The increasing diversity of our nation with respect to race, gender, and nationality presents both great opportunity and challenge. The full participation of currently underrepresented minorities and women is crucial to our commitment and social justice, as well as to the future

strength and prosperity of America. Without effective strategies for implementation, technology could exacerbate the economic stratification of our society.

Background: Extensive experience in developing and implementing effective strategies to achieve diversity in higher education as university president and in science and engineering as chair of the National Science Board.

Information and Communication Technologies: Modern technologies such as computers, telecommunications, and networks are driving profound, rapid, and discontinuous change in our society and social institutions. These disruptive technologies erode or obliterate conventional constraints such as space, time, boundaries, and monopolies because of their extraordinary pace of exponential evolution.

Background: Experience as scientist and engineer in computationally-intensive fields (supercomputers, nuclear energy, telecommunications), chair of National Academy of Sciences committees concerning impact of information technology on scholarship and on research university, director of technology-intensive companies such as Unisys, CMS Energy, and DiamondCluster.

Energy: Once again our nation is facing the consequences of a serious imbalance in energy supply, demand, and distribution, intensified by the growing awareness that conventional energy technologies have immense long-term implications for the planet (e.g., carbon emissions from fossil fuels and climate disruption). Many scientists believe this is the most serious issue facing our civilization, and it must be a focus of any futures scanning effort.

Background: Current chair of the Department of Energy's Nuclear Energy Research Advisory Committee, three decades of experience in advanced energy sources, director of CMS Energy, consultant to various federal projects and laboratories.

Technological Change: Several powerful technologies are evolving far more rapidly than most realize and could have great consequences for our society, including information technology, biotechnology (genomics, proteomics), and nanotechnology.

Background: Three decades of experience with nuclear science and technology, member and former chair of the National Science Board, recent development of new curricula in advanced technologies such as info/bio/nano technology.

For the past several years, the core activities of the Millennium Project have been sustained by a modest block grant from State of Michigan resources amounting to roughly \$300,000 per year. Since this support was of a one-time nature and will expire during the next year, the continued existence and activities of the Millennium Project as well as the support for my own activities will depend on obtaining external support from other sources such as foundations or the federal government.

This brief prospectus seeks to determine possible interest in providing either broad sustaining support for the Millennium Project in providing core support or sponsoring one of its several activities.

Appendix A

Current and Recent Activities (JJD)

- National Academy of Sciences Committee on Science, Engineering, and Public Policy (COSEPUP) (member)
- National Academy of Sciences Steering Group on the Federal Science and Technology Budget (chair)
- National Academy of Sciences Committee on Information Technology and the Future of the Research University (chair)
- National Research Council Panel on Scholarship in the Digital Age (chair)
- Nuclear Energy Research Advisory Committee, Department of Energy (chair)
- National Research Council Review Panel on the Triana Earth Observing Satellite Mission (chair)
- National Center for Postsecondary Improvement, Department of Education (Senior Scholar)
- Higher Education Associations (AAU, NASUGC, ACE)
- Advisory Committee on Education and Human Resources, National Science Foundation (member)
- National Partnership for Advanced Computation Infrastructure (oversight board)
- Committee for Developing Partnerships between Liberal Arts Colleges and Research Universities, Rackham School of Graduate Studies, University of Michigan (chair)
- A Strategic Plan for Technology-Driven Economic Development in Ontario, Council of Ontario Universities (co-PI)
- The Glion Group (Joint European-American Seminar exploring Leadership in Higher Education)
- President (and co-founder) of the Michigan Virtual Automotive College (now the Michigan Virtual University)
- Developed several new courses for the university in areas such as technology and society, preparing for academic careers, sports in America, and new learning organizations such as virtual universities
- Consultant to numerous university, state, and federal organizations on issues concerning higher education and science policy

Recent Books:

James J. Duderstadt, *A University for the 21st Century* (Ann Arbor: University of Michigan Press, 2000) 358 pp

James J. Duderstadt, *Intercollegiate Athletics and the American University: A University President's Perspective* (Ann Arbor: University of Michigan Press, 2000) 280 pp.

James J. Duderstadt, *Positioning the University of Michigan for the New Millennium: A Case Study in University Transformation*. (Ann Arbor: Millennium Project, 1999) 630 pp.

James J. Duderstadt and Farris W. Womack, *Beyond the Crossroads: The Future of the Public University in America*, manuscript submitted for publication (2000)

James J. Duderstadt, Daniel E. Atkins, and Douglas Van Houweling, *Higher Education Faces the Digital Age* (Washington: American Council on Education, in preparation)

(Other publications can be found on the website: <http://milproj.umm.umich.edu>)

Appendix B

Biographical Profile

James J. Duderstadt

Dr. James J. Duderstadt is President *Emeritus* and University Professor of Science and Engineering at the University of Michigan. He also serves as Director of the Millennium Project, a research center in Michigan's Media Union concerned with the future of the university.

Dr. Duderstadt received his baccalaureate degree in electrical engineering with highest honors from Yale University in 1964 and his doctorate in engineering science and physics from the California Institute of Technology in 1967. After a year as an Atomic Energy Commission Postdoctoral Fellow at Caltech, he joined the faculty of the University of Michigan in 1968 as Professor of Nuclear Engineering. Dr. Duderstadt became Dean of the College of Engineering in 1981 and Provost and Vice President for Academic Affairs in 1986. He was appointed as President of the University of Michigan in 1988, and served in this role until July, 1996. He currently holds a university-wide faculty appointment as University Professor of Science and Engineering.

Dr. Duderstadt's teaching and research interests have spanned a wide range of subjects in science, mathematics, and engineering, including work in areas such as nuclear systems, computer simulation, science policy, higher education, and information technology.

During his career, Dr. Duderstadt has received numerous national awards for his research, teaching, and service activities, including the E. O. Lawrence Award for excellence in nuclear research, the Arthur Holly Compton Prize for outstanding teaching, and the National Medal of Technology for exemplary service to the nation. He has been elected to numerous honorific societies including the National Academy of Engineering, the American Academy of Arts and Science, Phi Beta Kappa, and Tau Beta Pi.

Dr. Duderstadt has served on and/or chaired numerous public and private boards. These include the National Science Board; the Executive Council of the National Academy of Engineering; the Committee on Science, Engineering, and Public Policy of the National Academy of Sciences; the Nuclear Energy Research Advisory Committee of the Department of Energy; the Big Ten Athletic Conference; the University of Michigan Hospitals; and as a director of Unisys and CMS Energy.

He currently chairs several major national study commissions, including a National Academy of Science task force examining the impact of information technology on the future of the university, a National Research Council panel developing a guidebook concerning scholarship in the digital age, a NAS steering committee tracking and analyzing the federal R&D budget, and the Nuclear Energy Research Advisory Committee of the U.S. Department of Energy.

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