Duderstadt describes the forces of technology-driven change affecting our world in general and higher education in particular. He believes that these social, economic, technological, and market forces are far more powerful than many people within the higher education establishment realize. They drive change at an unprecedented pace, perhaps beyond the capacity of our colleges and universities to adapt. Duderstadt identifies the long-standing tradition of shared governance, in which power is more or less shared equally among all potential decision makers, as neither effective nor responsive enough to allow higher education to control its own destiny.
The contemporary university is one of the most complex social institutions of our times. The importance of this institution to our society, its myriad activities and stakeholders, and the changing nature of the society it serves, necessitate experienced, responsible, and enlightened university leadership, governance, and management. American universities have long embraced the concept of shared governance, involving public oversight and trusteeship, collegial faculty governance, and experienced, but generally short-term administrative and usually amateur, leadership. While this system of shared governance engages a variety of stakeholders in the decisions concerning a university, it does so with an awkwardness that tends to inhibit change and responsiveness.

Today higher education has entered a period of significant change as our colleges and universities attempt to respond to the challenges, opportunities, and responsibilities they face in the new century. The forces driving change in higher education are many and varied: the globalization of commerce and culture, the lifelong educational needs of citizens in a knowledge-driven global economy, the exponential growth of new knowledge and new disciplines, the compressed timescales and nonlinear nature of the transfer of knowledge from campus laboratories into commercial products, and the impact of information and communication technologies.

As we face a period of rapid, profound, uncertain, and frequently discontinuous change, one might question whether our current traditions of university decision-making and academic change are sufficiently responsive to allow higher education to control its own destiny. There is a risk that a tidal wave of economic, social, and technological forces may sweep over the academy, transforming higher education in unforeseen and unacceptable ways while creating new institutional
forms that challenge both our experience and our concept of the university.

FORCES OF CHANGE

Our world is in the midst of a social transition into a post-industrial society as our economy has shifted from material- and labor-intensive products and processes to knowledge-intensive products and services. A radically new system for creating wealth has evolved that depends upon the creation and application of new knowledge. We are at the dawn of an age of knowledge in which the key strategic resource necessary for prosperity has become knowledge itself, that is, educated people and their ideas.¹ Unlike natural resources such as iron and oil that have driven earlier economic transformations, knowledge is inexhaustible. The more it is used, the more it multiplies and expands. But knowledge is not available to all. It can be absorbed and applied only by the educated mind. Hence, as our society becomes ever more knowledge-intensive, it becomes ever more dependent upon those social institutions, such as the university, that create knowledge, educate people, and provide them with knowledge and learning resources.²

Furthermore, through travel and communication, the arts and culture, or the internationalization of commerce, capital, and labor, the United States is becoming increasingly linked with the rest of the world. The world, and our place in it, has changed. A truly domestic U.S. economy has ceased to exist. It is no longer relevant to speak of the health of regional economies or the competitiveness of American industry because we are no longer self-sufficient or self-sustaining. Our
economy, our companies, and our labor force are international and intensely interdependent with those of other nations.³

This internationalization also continues to take place within our borders as we are nourished and revitalized by wave after wave of immigrants who bring unbounded energy, hope, and faith in the American dream. America is evolving into a “world nation” not only in terms of its economic and political ties, but also in terms of ethnic ties many of our citizens share with other parts of the globe. From this perspective, it becomes clear that understanding cultures other than our own has become necessary, not only for personal enrichment and good citizenship, but for our very survival as a nation.

The increasing diversity of the American work force with respect to race, ethnicity, gender, and nationality presents a similar challenge. Women, minorities, and immigrants now account for roughly 85 percent of the growth in the labor force, currently representing 60 percent of all of our nation’s workers. The full participation of currently underrepresented minorities and women is crucial to our commitment to equity and social justice, as well as to the future strength and prosperity of America.

Our nation cannot afford to waste the human talent and the cultural and social richness represented by those currently underrepresented in our society. If we do not create a nation that mobilizes the talents of all our citizens, we are destined to play a diminished role in the global community and will, in all likelihood, see an increase in social turbulence. Most trag-
cally, we will have failed to fulfill the promise of democracy upon which this nation was founded.

Increasing diversity, one of our greatest challenges as a nation, is complicated by social and economic factors. Far from evolving towards one America, our society continues to be hindered by the segregation and non-assimilation of minority cultures. As both a leader of society at large and a reflection of that society, the university has a unique responsibility to develop effective models of pluralistic, multicultural communities for our nation. We must strive to achieve new levels of understanding, tolerance, and mutual fulfillment for people of diverse racial and cultural backgrounds, both on our campuses and beyond. It has also become increasingly clear that we must do so within a new political context that will require new policies and practices, since the courts and legislative bodies are now challenging long-accepted programs such as affirmative action and equal opportunity.

TECHNOLOGY-DRIVEN CHANGE

Our rapid evolution into a knowledge-based, global society has been driven in part by the emergence of powerful new technologies such as computers and communications networks. Technology has vastly increased our capacity to know and do things, and to communicate and collaborate with others. It allows us to transmit information quickly and widely, linking distant places and diverse areas of endeavor in productive new ways. Technology lets us form and sustain communities for work, play, and learning in ways unimaginable just a decade ago.

Higher education has already experienced significant change driven by technology. Our management and administrative processes, as well as research and scholarship, are
highly dependent upon information technology, for example, the use of computers to simulate physical phenomena, networks to link investigators in virtual laboratories or collaboratories, and digital libraries to provide scholars with access to knowledge resources. There is an increasing sense that new technology will also have a profound impact on teaching, freeing the classroom from the constraints of space and time, and enriching learning by providing students with access to original source materials.

Yet, while information technology has the capacity to enhance and enrich teaching and scholarship, it also poses certain threats to our colleges and universities. We can now use powerful computers and networks to deliver educational services to anyone, anyplace, anytime, and are no longer confined to the campus or the academic schedule. Technology is creating an open learning environment in which the student has evolved into an active learner and consumer of educational services. Faculty loyalty is shifting from campus communities and universities to scholarly communities distributed in cyberspace. The increasing demand for advanced education and research from a knowledge-driven society, the appearance of new for-profit competitors, and technological innovations are stimulating the growth of powerful market forces that could dramatically reshape the higher education enterprise.

Perhaps most significant is the disruptive nature of this technology, which tends to drive rapid, unpredictable, and frequently discontinuous change in society and social institutions. Information technology changes the relationship between people and knowledge. It is likely to reshape knowledge-based institutions such as the university. While most believe the university will survive the digital age, few deny that it could change dramatically in form and character. Knowledge is both a medium and a product of the university
as a social institution. Hence, it is reasonable to suspect that a
technology that expands our ability to create, transfer, and
apply knowledge by factors of 100 to 1,000 every decade will
have a profound impact on both the mission and the function
of the university.

Information and communication technology will affect the
activities of the university (teaching, research, and outreach),
its organization (academic structure, faculty culture, finance,
and management), and the broader higher education enter-
prise. At least for the near term, meaning a decade or less, I
believe the research university will continue to exist in its pre-
sent form. However, meeting the challenge of emerging com-
petitors in the marketplace will demand significant changes in
how we teach, how we conduct scholarship, and how our in-
tstitutions are financed.

Over the longer term technology will drive very significant
restructuring of our society and social institutions through
what John Seely Brown and Paul Duguid⁴ term the 6D effects
of demassification, decentralization, denationalization, des-
specialization, disintermediation, and disaggregation. Per-
haps we should also add a seventh “D”, democratization,
since digital technology provides unusual access to knowledge
and knowledge services (such as education) hitherto re-
stricted to the privileged few. Like the printing press, this
technology not only enhances and broadly distributes access
to knowledge, it also shifts power away from institutions to in-
dividuals.

IMPLICATIONS FOR HIGHER EDUCATION

A century ago, a high school diploma was viewed as a ticket to
a well-paying job and a meaningful life. Today, a college de-
gree has become a necessity for most careers. A growing pop-
ulation will necessitate growth in higher education to accommodate the projected increases in the number of traditional college age students. Additionally, growth and adaptation will be required to respond to the educational needs of adults as they seek to adapt to the demands of the high-performance workplace. Some estimate this adult need for higher education will become far larger than that represented by traditional 18-to–22-year-old students. Furthermore, these educational needs will be magnified many times on a global scale, posing both a significant opportunity and major responsibility for American higher education. The case can be made that it has become the responsibility of democratic societies to provide their citizens with education and training, whenever, wherever, and however they desire it, at high quality and at a cost they can afford. Yet there is growing concern about whether our existing institutions have the capacity to serve these changing and growing social needs and whether they will even be able to survive in the face of these extraordinary changes.

The growing and changing nature of the needs of higher education will trigger strong economic changes. Traditional sources of public support for higher education such as state appropriations or federal support for student financial aid have not kept pace with the growing demand. The increasing costs of higher education, driven by the knowledge- and people-intensive nature of the enterprise, and by the difficulty educational institutions have in containing costs and increasing productivity, aggravate this imbalance between demand and available resources.

In this light, we must remember that market forces also act on our colleges and universities, even though we generally think of higher education as public enterprise, shaped by public policy and actions to serve a civic purpose. Society seeks services such as education and research. Academic institu-
tions must compete for students, faculty, and resources. This industry is heavily subsidized and shaped by public investment so that prices are always far less than true costs. Furthermore, the value of education services is hard to quantify, based on perceptions such as the importance of a college degree for personal success and the prestige associated with certain institutions. Ironically, the public expects not only the range of choice that a traditional industry provides, but also the subsidies that make the price of a public higher education less than its cost to the providers.

In the past, most colleges and universities served local or regional populations. While there was competition among institutions for students, faculty, and resources, at least in the U.S., the fact that institutions controlled the awarding of degrees gave universities an effective monopoly over advanced education. However, today all these constraints are being challenged. The growth in the size and complexity of the postsecondary enterprise is creating an expanding array of students and educational providers. Information technology eliminates the barriers of space and time, and new competitive forces such as virtual universities and for-profit education providers enter the marketplace to challenge the credentialing monopoly of traditional universities.

The weakening of regulations and the emergence of new competitive forces, driven by changing societal needs, economic realities, and technology, are likely to drive a massive restructuring of the higher education enterprise. This change should be similar to changes in other restructured sectors of the economy, such as healthcare.

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We may be seeing the early stages of the appearance of a global knowledge and learning industry.
transportation, communications, and energy, and result in mergers, acquisitions, new competitors, and new products and services that have characterized other economic transformations. We may be seeing the early stages of the appearance of a global knowledge and learning industry, in which the activities of traditional academic institutions converge with other knowledge-intensive organizations such as telecommunications, entertainment, and information service companies.\(^7\)

This perspective of a market-driven restructuring of higher education as an industry — while perhaps both alien and distasteful to the academy — is an important framework for considering the future of the university. The postsecondary education market is very demanding, with the ability to reward those who can respond to rapid change and punish those who cannot. Universities will have to learn to cope with the competitive pressures of the marketplace while preserving the most important of their traditional values and character.

These social, economic, technological, and market forces are far more powerful than many people within the higher education establishment realize. These forces are driving change at an unprecedented pace, perhaps even beyond the capacity of our colleges and universities to adapt. There are increasing signs that our current paradigms for higher education, the nature of our academic programs, the organizations of our colleges and universities, and the way that we finance, conduct, and distribute the services of higher education may not be able to adapt to the demands of our times.

### Challenges to University Decision Making and Governance

Both the pace and nature of change have become so rapid and so profound that social institutions (government, education,
and the private sector) have increasing difficulties in sensing changes (although they certainly feel the consequences) and understanding them sufficiently to respond and adapt. Powerful and frequently opposing forces buffet the contemporary university. Economic, social, and technological forces drive rapid change in all aspects of our society and our world. The marketplace demands cost-effective services. The government and the people demand accountability for the expenditure of public funds. The faculty demands (or at least should demand) adherence to long-standing academic values and traditions such as academic freedom and rigorous inquiry. Yet the long-standing tradition of shared governance, in which power is shared more or less equally among all potential decision makers, is cumbersome and awkward at best, and ineffective and indecisive at worst.

University governing boards already face a serious challenge in their attempts to understand the increasingly complex nature of the university and its relationships to broader society because of its nonspecialist composition. This is accentuated by politics of governing boards, particularly in public universities, that not only distract boards from their responsibilities, but also discourage many experienced, talented, and dedicated citizens from serving on these boards. The increasing intrusion of state and federal government in the affairs of the university (in the name of performance and public accountability, which are all too frequently driven by political opportunism) can trample upon academic values and micromanage institutions into mediocrity. Furthermore, while the public expects its institutions to be managed effectively and efficiently, it weaves a web of constraints through public laws that make this difficult. Sunshine laws demand that even the most sensitive business of the university must be conducted openly, including the search for a president. State and federal laws entangle all aspects of the university in rules and regula-
For the most part, our institutions still have not grappled with the extraordinary implications of an age of knowledge that will likely be our future.

BETWEEN A ROCK AND A HARD PLACE

tions, from student admissions to financial accounting to environmental impact.

Efforts to include the faculty in shared governance also encounter obstacles. Faculty governance continues to be both effective and essential for academic matters such as curriculum development, faculty hiring, and tenure evaluation. However, it is increasingly difficult to achieve true faculty participation in university matters such as finance, capital facilities, or external relations. The faculty traditions of debate and consensus building, along with the highly compartmentalized organization of academic departments and disciplines, seem incompatible with the breadth and rapid pace required in today’s high-momentum, university-wide decision environment. Most difficult and critical of all are those decisions that concern institutional transformation.

The university presidency is all too frequently caught between these opposing forces, between external pressures and internal campus politics, between governing boards and faculty governance, between a rock and a hard place. Today there is an increasing sense that neither the lay governing board nor elected faculty governance has either the expertise or the discipline (not to mention the accountability) necessary to cope with the powerful social, economic, and technology forces driving change in our society and its institutions.

Corporations have undergone restructuring and reengineering. Governments and other public bodies are being over-
hauled, streamlined, and made more responsive. Individuals increasingly face impermanence in their employment, their homes, and even their families. The nation state itself has become less relevant and permanent in an ever more interconnected world. Yet, while most colleges and universities have grappled with change at the tactical level, few have contemplated more fundamental transformations in mission and character that may be required by our changing world. For the most part, our institutions still have not grappled with the extraordinary implications of an age of knowledge that will likely be our future. Most universities continue to approach change by reacting to the necessities and opportunities of the moment rather than adopting a more strategic approach.

This time of great change and shifting paradigms provides an appropriate context within which to consider the leadership of the university. Like other social institutions, the university will require strong, visionary, and courageous leadership, particularly during times of great change, challenge, and opportunity.

**DEVELOPING THE CAPACITY FOR CHANGE**

The most critical challenge facing most institutions will be to develop the capacity for change. Universities must remove the constraints that prevent them from responding to the needs of a rapidly changing society. They should strive to challenge, excite, and embolden all members of their academic communities to embark on what should be a great adventure for higher education. The successful adaptation of universities to the revolutionary challenges they face will depend on an institution’s collective ability to learn and to continuously improve its decision-making process. It is critical that higher education gives thoughtful attention to the design of institutional pro-
Nowhere is there a serious discussion of the fundamental values necessary to the nature and role of the public university.

cesses for planning, management, and governance. Only a concerted effort to understand the important traditions of the past, the challenges of the present, and the possibilities for the future can enable institutions to thrive during a time of such change.

Leading the introduction of change can be both a challenging and a risky proposition. The resistance can be intense, and the political backlash can be threatening. It is sometimes difficult to act for the future when the demands of the present can be so powerful and the traditions of the past so difficult to challenge. Yet, perhaps this is the most important role of university leadership and the greatest challenge for the university decision process in the years ahead.

Here I have raised concerns about the growing chasm between the demands of an era of rapid change and the current culture and tradition of university administration, management, and governance. Governing boards focus more on oversight and accountability than on protecting and enhancing the capacity of their university to serve the changing and growing educational needs of our society. Faculty governance (at least in its present state) is largely ineffectual, in many cases even irrelevant, for either the nature or pace of the issues facing the contemporary university. University leadership, at the level of chairs, deans, or presidents, has insufficient authority to meet the considerable responsibilities engendered by powerful forces of change. And nowhere (within the academy, at the level of governing boards, or in government policy) is...
there a serious discussion of the fundamental values necessary to the nature and role of the public university.

But the most important conclusion is that the complexity of the contemporary university and the forces acting upon it have outstripped the ability of lay boards and elected faculty bodies to govern and undermined the capacity of academic administrators to lead. It is time we considered replacing the existing paradigm of lay governing boards with true boards of directors, comprised of experts experienced in the activities of higher education and held publicly, legally, and financially accountable. We also need a new culture of faculty governance willing to accept responsibility along with authority. And we need to provide academic leaders with adequate training in the “profession” of administration, management, and leadership, even as we delegate to them a degree of authority commensurate with their executive responsibilities. It is simply unrealistic to expect that the governance mechanisms developed decades or even centuries ago can serve well either the contemporary university or the society it serves.

NOTES


**James 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 impact of technology on research and teaching. He earned his Ph.D. in engineering science and physics from the California Institute of Technology. Duderstadt has authored several books and multiple articles. He currently chairs several national study commissions, including a National Academy of Science task force examining the impact of information technology on the future of the university and a National Research Council panel developing a guidebook on scholarship in the digital age.