

CHAPTER

The Research-led University and the Wider Community

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INTRODUCTION

Trying to design the University of the Future does, of course, present an academic like me with the temptation of creating the University of Utopia, devoted to the pursuit of pure knowledge, feasible because all the issues that would require the troublesome involvement with “the wider community” would have been solved. “UU” would have no need for involvement with society for financial reasons, being amply funded by, maybe, a substantial land grant from the Elysian fields. One could pursue the monastic tradition in universities to the full. I will not yield to that temptation.

But, nor will I succumb to describing what some of our more pessimistic colleagues fear will be the University of Dystopia, a university totally mired in the narrowly utilitarian and politically expedient, whose funding would be totally dependent on endless catering to commercialization and political whim. I will not pursue a university that is totally driven by the market.

The University of the Future that I will attempt to charter will be firmly rooted in the tradition of the free and open pursuit of knowledge and understanding by scholars and scientists – and students – who are driven by their curiosity, in a community of critical peers, to explore all aspects of our universe and our human existence. But this University of the Future will also, in a somewhat idealized form of the American land-grant tradition, be connected with, and serve, the society of which it is a part – and notably a society that is global, but not monolithic or mono-cultural.

Land-Grant Act: "AN ACT Donating Public Lands to the several States and Territories which may provide Colleges for the Benefit of Agriculture and Mechanic Arts." (First Morrill Act, 1862)

Summary: Morrill Act of 1862 established the Land Grant university system. On July 2, 1862, President Abraham Lincoln signed into law what is generally referred to as the Land Grant Act. The new piece of legislation introduced by U.S. Representative Justin Smith Morrill of Vermont granted to each state 30,000 acres of public land for each Senator and Representative under apportionment based on the 1860 census. Proceeds from the sale of these lands were to be invested in a perpetual endowment fund which would provide support for colleges of agriculture and mechanical arts in each of the states.

FIRST MORRILL ACT. July 2, 1862: AN ACT Donating Public Lands to the several States and Territories which may provide Colleges for the Benefit of Agriculture and Mechanic Arts.

SECOND MORRILL ACT. August 30, 1890. AN ACT To apply a portion of the proceeds of the public lands to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under the provisions of an act of Congress approved July 2, 1862.

The University of the Future must moderate between "the monastery and the market"¹

The essence of the relationship with the wider community

First and foremost, the University of the Future will contribute to the wider community by being a free and open centre for discovery and learning. This is paramount, and underlies all that I say in this paper concerning specific interaction with the wider community.

The University of the Future will address a broad array of important concerns and needs of the wider community, drawing on the rich store of knowledge and understanding accumulated through its disciplinary and interdisciplinary pursuits, as well as on continuous interaction with society and its decision-makers and practitioners. The essence of the relationship between the University of the Future and the wider community will be this interplay between, on the one hand, fundamental knowledge and understanding and, on the other hand, practice and real-world problem-solving.

The University of the Future will contribute directly to the wider community in a variety of ways, ranging from data gathering and analysis to transfer of know-how and technology to the development of policy options, from economic development to cultural enrichment, from the local to the global.

¹ Quote from Illinois, Champaign-Urbana, Chancellor Nancy Cantor in recent speech.

It is also important to note that the University of the Future will provide evaluation and critique of societal performance and actions. Properly combining these two types of roles – being a contributor to the development of society and at the same time being a critic of society – is a fundamental challenge.

Issues and prerequisites for pursuing them

In what follows, I will identify some issues that I believe the University of the Future will have to address in order to connect with, and serve, its wider community. I will also touch on some of the prerequisites to the effective pursuit of these issues in terms of the governance, organization, financial management, regulation, personnel policies, information services, and “culture” of the university.

The issues involved must be addressed by the University of the Future in collaboration with other universities of that future, as well as other institutions of the wider community of the future. The University of the Future will not be able to fulfil its noble mission without such collaboration.

The community of the future must also ensure proper governance for the universities, with guarantees of institutional independence and individual academic freedom, because the agenda that the University of the Future will pursue for, and with, the wider community will be fraught with conflict. I am tempted to say that the more important the university’s role as arbiter of knowledge and critic of society becomes, the greater the potential for conflict.

Issues to be addressed by University of the Future in its interaction with wider community

Before outlining some of the issues I believe will be important in the research university’s future direct interaction with the wider community, let me again emphasize that its role in undergraduate, graduate, and professional education and in research will, of course, continue to be its most fundamental responsibility. One of the important ways it will directly serve the community, perhaps especially its own alumni, will be through lifelong learning. Service to the “wider community” should increasingly include contracts for continuing learning by the university’s “students for life”.

As we consider the research university’s direct interaction with the community, the following sets of issues seem to me to be paramount:

- Security, democratic values, and world peace
- Cultural diversity
- Economic development

- The environment
- Health
- Education
- The arts

Security, democratic values, and world peace

Security issues have been a high priority since 9/11. There is no reason to expect that they will not be important also in the future that we are probing.

It is an essential role for the University of the Future to help ensure that the perspective on security is broad and deep. The university is responsible for seeing to it that the perspective includes an understanding of the major forces that drive world events as well as of the values that are fundamental to democracy.

The university is responsible for ensuring that the government and important community agencies have access to experts who have the knowledge and understanding of events and their contexts to provide analysis and policy recommendations based on sound judgments.

The university must itself, through its research activities, provide independent analysis and critique of what is happening in regard to various cultural, religious/ideological, and political movements around the world, as well as in the nation where the university is located, including critique of the national responses to world events.

What about advocacy? Is it a proper role for the University of the Future? Certainly, in the United States the first amendment and the guarantee of academic freedom give to each scholar/scientist the right to advocacy. In the context of the university as an institution, it is important that academic freedom should be exercised with responsibility, including civility, but the sanctions against “irresponsible words and actions” should be those of critique in open debate rather than censure or other action, unless physical threat is involved.

What about advocacy by the university as an institution through its leaders, that is, primarily through its president and the board? Advocacy for basic democratic and academic values is, of course, appropriate for the university. I would include in those categories both issues of diversity, that is, of equitable participation, and issues of research ethics. The University of the Future should by no means be value-neutral in these regards. When it comes to even more directly politically charged issues, such as domestic and global economic policies or foreign policy, we need to give serious consideration to the extent to which university boards and presidents should take a stand. We ought not automatically, or superficially, to assume that taking an institutional stand on such issues is illegitimate, but extremely careful judgment has to be exercised in each case. The line is not easy to draw between legitimate,

and necessary, institutional advocacy on fundamental values and inappropriately taking sides on “purely” political questions. The critical dividing line may be whether the university has a direct interest in the outcome of the issue or not; if the former is the case, there should be no hesitation in taking a stand.

Which leads me to a second set of important issues, those of cultural diversity.

Cultural diversity

The University of the Future is, of course, going to have to be heavily involved in issues of cultural diversity. Through its research activities, it will need to provide knowledge and understanding of different cultures as well as of cultural diversity, within its own nation and globally.

The university must conduct advanced education for experts in languages and cultures, and on multiculturalism, as well as undergraduate education in these fields. The university will have the responsibility to ensure that qualified teachers in these areas are educated for the primary and secondary schools. It will have the responsibility to provide opportunities for the general public, on a lifelong basis, to learn other languages and become informed about other cultures, and about the nature of multiculturalism.

One of the difficult questions that the university must help the wider community deal with through its research and teaching is that of what is and what is not acceptable in a culture. There are, of course, many examples of cultural practices and beliefs that are incompatible with democratic values, for example, various expressions of racism and religious intolerance, and certain so-called “honour codes” that require killing somebody for the sake of personal and family honour, and female circumcision.

Obviously, the more fraught with conflicting values an issue is, the more important it becomes that a university, as an independent agency where data-gathering, analysis, critical give-and-take and evaluation can take place, will address the issue.

Economic development

The dual role of the University of the Future as, on the one hand, an important agent in furthering certain kinds of development in society and, on the other hand, a critic of those same developments, is probably found in all my examples, and it certainly shows up with force in the area of economic development.

The importance of the university, especially the research university, to economic development has become abundantly clear during the past decades. Witness the scramble among politicians in the United States to

ensure that their region has one or more such universities – and for earmarks to nourish their research!

The fact that more and more of the funding of universities is coming through collaboration with business and industry has become a problem as well as being a potential boon. The perception, and potential reality, that what I called “narrowly utilitarian” concerns have dangerously encroached upon academe will have to be addressed also by the University of the Future.

Not only has collaboration with business and industry increased because of initiatives by these sectors and the universities, the government has begun to set priorities for funding that are tied more and more to specific economic development goals. In the United States, we find both federal cross-agency investment priorities and state investment initiatives for research based on economic considerations.

Overarching priorities at the federal level

Among the priorities that have emerged in recent years at the federal level are:

- Nanotechnology (FY2003: \$774 million)
- Networking and Information Technology (FY2003: \$2 billion)
- Climate Change Science Program (FY2003: \$1.7 billion)
- Education R & D – “research-based programs and practices called for in No Child Left Behind” (FY2004: \$50 million)
- Recently added: Science and Technology to Combat Terrorism (FY2004: \$900 million).

State Research Initiatives: Michigan (1)²

“In the State-of-the State address, (newly elected) Governor Granholm announced the Technology Tri-Corridor initiative to research, develop, and commercialize advancements in the life sciences, automotive technology, and the emerging homeland security sector. The tricorridor will focus new technology, business recruitment and development in these three critical areas.”

The Governor is quoted as stating: “In the knowledge economy, business and education are linked; you cannot succeed at the former if you do not excel at the latter.”

State Research Initiatives: Michigan (2)

Life Sciences Corridor: For example, the University of Michigan has established a Life Sciences Institute to serve as a hub for cross-disciplinary

2 From summary provided by University of Michigan.

research and teaching in the life sciences. Between 20 and 30 faculty members, housed in a \$100-million facility under construction. The proposed research agenda:

- Developing more effective gene therapies for cancer
- Learning how a key blood coagulation protein changes with age
- Creation of a new biosensor to detect bacteria and viruses
- Studying the effects of “good” cholesterol protein on heart disease
- Finding the gene for macular degeneration – leading cause of blindness
- Developing new high-resolution mammography technology
- Clinical trials of a bioartificial kidney
- Developing new drugs to treat heart attacks and cardiovascular disease
- Testing a substance that kills bacterial. Viral and fungal contaminants in blood

University of Michigan, Michigan State University, Wayne State University, and the Van Andel Institute have joined to form the Core Technology Alliance for innovation.

State Research Initiatives: Michigan (3)

Automotive Corridor: Includes University of Michigan’s Transportation Research Institute. The research agendas include:

- Powertrain systems (thermal and energy systems)
- Fuel cells
- Hybrid electric vehicles
- Vehicle structural design, including crashworthiness
- Materials and processes, including metals, polymers, adhesives, and manufacturing processes
- Environmental concerns, including emission controls
- Intelligent transportation systems, including crash avoidance and smart sensors
- Enterprise systems, including supply chain management, modular vehicle design, supplier involvement in product development.

State Research Initiatives: Michigan (4)

Homeland Security Corridor: The research agendas include:

- Environmental monitoring for contaminants in air and biological media

- Rapid-detection methods of various kinds
- Infrastructure monitoring
- Infrastructure design and vulnerability
- Robotics, including automated guided vehicles on land and under water
- Development of vaccines
- Treatment of contaminated soils and water
- Security systems in urban areas
- University of Michigan in 2002 established a Bioterrorism Preparedness Initiative as a means to address such issues.

The important R & D function of universities must continue in the future, but it must continue under conditions that do not undermine the fundamental role of universities as independent arbiters of knowledge and critics of economic policies and actions, nationally and internationally.

The environment

The University of the Future will, of course, continue to enhance our understanding of the environment, and our ability to manipulate it, including through genetic engineering. It will be important that the role of the university in making it possible for us to manipulate, and actually preserve or destroy the environment remain strongly coupled with its role as arbiter of objective knowledge about the effects of manipulation, and as critic of policies and practices that affect the environment.

Health

Similarly, the University of the Future will continue to be a major contributor to the knowledge and understanding of our physical and mental well-being, and of disease, as well as to our ability to deal with these issues through public health measures and clinical practice.

The university has already encountered conflict between different values in the case of genetic manipulation, including stem cell research, cloning and other forms of genetic selection. The freedom to pursue certain research, potentially providing cures for serious diseases, is running up against concerns about undue manipulation of human life, partly based on religious beliefs. The difficult issues society faces in determining what is ethically acceptable of what is technically possible will require the active involvement of the University of the Future in the form of both analysis and education and thoughtful advocacy.

Statement on cloning by the Association of American Universities, Winter 2002

"The Association of American Universities has a long history of supporting academic and scientific freedom. It also recognizes the importance of conducting research consistent with ethical, legal, and safety requirements.

AAU strongly opposes human reproductive cloning, and supports legislation to ban this practice. The National Academy of Sciences (NAS) has concluded that cloning procedures are currently not safe for humans and that no responsible scientists or physicians are likely to undertake to clone a human. We generally do not support legislation to limit fields of research, but since some organizations have announced an intention to clone humans, we concur with the NAS that a legal ban is more likely to deter any attempt to clone a human than would any voluntary system or moratorium. The ban should be reconsidered at five-year intervals, based on current scientific knowledge.

In contrast to human reproductive cloning, AAU continues to support human stem cell research. Once necessary research in animal models is conducted and important donor and patient safety issues are satisfactorily resolved, AAU can also support nuclear transplantation to produce stem cells, which is also known as somatic cell nuclear transfer, as nonreproductive cloning, and as therapeutic cloning. We concur with the NAS that nuclear transplantation to produce stem cells has considerable potential for advancing our fundamental knowledge and developing new medical therapies to treat life-threatening diseases, and that this research should proceed in parallel with other types of stem cell research, including human embryonic and adult stem cell research."

As in the case of the other issues that I have identified, the university must be a forum for free and open debate of the pros and cons of different stands on these issues.

It will also be responsible for the effective implementation of policies and practices that will ensure compliance with adopted regulations, under the pressures of constantly evolving technical possibilities and commercial opportunities.

It will be responsible for leading the development of ethical practices as well as for educating decision-makers and the public about the choices and their implications.

Again, we encounter the need for the university, through its research and teaching, to play the role of critic, be it of practices such as smoking, or of dietary fads, or of the effects of general lifestyle on health, sometimes in conflict with both tradition and commercial interests.

Finally, through its research and teaching, as well as, in some cases, as an actual health-care deliverer, the university will have a role to play in regard to the effectiveness of the health systems that are adopted, or being considered; this is another set of issues fraught with politics and commercial interests.

Education

To say that the University of the Future must address education may seem to be too obvious to even mention. There are, however, several reasons why I think it is important to include this topic among my examples of university responsibilities vis-à-vis the wider community, even as many others are left out.

First, the effectiveness of the education universities themselves provide, not least the research universities, needs continuing attention, both at the graduate and undergraduate level. I believe that it is essential for the University of the Future to adhere to the Humboldtian idea that a certain kind of learning can best take place in the setting of scientific and scholarly inquiry. The university needs to deal with what Burton Clark (1995, p. 189ff) has called “research drift”, the tendency to isolate research from teaching, and “teaching drift”, the tendency to isolate teaching from research.

But this is not the place to argue that matter. As far as the role of the university vis-à-vis the wider community is concerned, it is, however, important to stress the role of the university in educating teachers for primary and secondary schools, and in conducting pedagogical research that can lead to educational reforms based on sound experimentation rather than fads. We face massive challenges as we try, across terrifying cultural, social, and economic – and, even today, racial – barriers, to ensure that the next generation will be able to participate in a society where a certain amount of “book” knowledge and access to, and ability to use, information are becoming more essential than ever.

The needs of the wider community as well as the potential of information technology hold out the possibility that the University of the Future will be able to provide educational opportunities anywhere, at any time, on a life-long basis. The University of the Future has the potential of becoming the ubiquitous university.

The arts

Many research universities provide not only humanistic scholarship and scientific research but also artistic activity. Like scholarship and research, the arts have much to contribute to the wider community. It is hard to overvalue the impact of universities on the arts in their communities, or for that matter nationally, be it in the form of music, theatre, dance, painting, sculpture, architecture, or other arts.

Especially in a society of mass culture, franchise culture, the University of the Future must play a major role in fostering, and supporting, individual and local artistic activity. The university will provide its own facilities and programmes for the arts, but can also play an important role in the establish-

ment and maintenance of arts institutions such as orchestras/concert halls and museums.

The University of the Future must provide opportunities for artistic activity by its faculty and students, but it must also interact with the wider community by offering access to performances and exhibits, and by having faculty and students participate in community arts activities, including important internship opportunities for students.

Having briefly outlined some of the many issues that I think the University of the Future must address in its interaction with the wider community, let me now turn to some of the implications of, and prerequisites for, pursuing such an agenda.

"Opera on the Farm"³

An example of the arts contributing to the wider community in the spirit of the land-grant university is the University of Minnesota's "Opera on the Farm" programme. This programme was conducted by the university's School of Music and its director at the time, Professor Vern Sutton, in the mid-1990s. Aaron Copland's "The Tenderland" and Gaetano Donizetti's "The Elixir of Love", operas that are both set on farms – although the former in America and the latter in Italy – were performed by faculty and students on farms in western Minnesota and the Dakotas, with local church choirs serving as choruses, and a local "Beth" in "The Tenderland" at each locality. Thousands of people attended the performances, most of whom had never before seen an opera.

SOME IMPLICATIONS OF PURSUING RESEARCH UNIVERSITY'S AGENDA WITH WIDER COMMUNITY

I will consider:

- Governance
- Organization
- Financing
- Regulation
- Personnel policies and practices
- IT
- The "culture" of the university
- "Hubs and spokes"

3 Information provided by the University of Minnesota.

Governance

The main feature of the governance of the University of the Future must be to ensure independence. And I will add: with accountability! Independence is necessary to ensure that the most creative minds – of which we expect to have a fair share in the university, although certainly no monopoly – will be able to set and pursue the basic agendas in the search for knowledge and understanding. In the tradition established, almost miraculously, at Paris and Bologna eight centuries ago, when the university as we know it was born, the governance system must protect the practitioners of the search for knowledge.

A system must be found, however, that can deal with the problem of protection coupled with continued productivity and renewal.

Tenure must, I believe, continue to be a bulwark protecting free and open inquiry. It has been the key to the prospering of universities over the centuries, sometimes in the face of frontal attacks by political and other vested interests, often in the face of external interests of one kind or another that would rather not see certain findings made public, or certain issues pursued at all.

Effective performance reviews, including post-tenure reviews to ensure continued productivity, must also be part of the future university. The review system must strike the sometimes difficult balance between evaluation by immediate peers (and potential competitors) and by representatives of the university who can help ensure that new, and sometimes controversial, research gets its due. The choice of alternative responsibilities (focused alternatively, for example, on research, teaching and service) at different stages of a scholar's or scientist's career may offer opportunities for continued productivity and renewal.

The governance system must also help connect the University of the Future with the wider community by participating in the identification and evaluation of the kind of agenda that I have outlined. Priorities will have to be set! It will also be important for the board – even under the conditions of independence that I have stressed – to provide for appropriate accountability procedures. These procedures should be both internal, assuring that the university is serving its mission and achieving its objectives, and external, assuring the community that important societal objectives are effectively served by the university. The board members should be selected for their mature judgment, their knowledge and their personal independence from narrow political and other considerations.

The governance system should connect and protect!

Organization

The main feature of the organization of the University of the Future must be its flexibility. While the traditional disciplinary structures have served us very well over the centuries, we must find ways of ensuring that interdisciplinary activities can be undertaken and prosper.

The flexibility must include both a process that allows new interdisciplinary ideas and activities to be tested – with some kind of sunset provisions – and a process that will provide more permanent structures for successfully tested ideas and activities.

It is especially important that flexible structures are made available for interaction with the wider community. The departmental structures are rarely suitable for the kind of agenda that I have outlined. We will need to build, and expand, structures on the model of the land-grant university's extension service and more recent knowledge and technology transfer enterprises. The new structures – and much experimentation is going on – ought to accommodate participation both by scholars and scientists across the university's disciplines and interdisciplinary programmes and by practitioners from the wider community. Consortia of various kinds have been used to address, for example, the needs of children, youth and families, economic development for sectors of business and industry and for communities and regions, and local and regional planning, and such arrangements must, subject to periodic evaluation, be part of the University of the Future.

Financing

Some mechanism must be found to allocate resources to activities, units and individuals for the pursuit of the agenda. Again, flexibility will be important. Budgets cannot be allowed to be frozen into atrophying units, or into what a friend of mine calls "extinguished volcanoes". There must be funds available for constant experimentation as well as for successfully tested new activities. A matrix budgeting system is appropriate, where the traditional departments, or other established units, are the columns, receiving funding in the traditional mode, and new interdisciplinary activities, often spanning several traditional units, are the rows, receiving funding that is then portioned out for the specified purpose to participating units.

It will undoubtedly be necessary to pursue many sources of funding. The financing system must allow, and assist, the leaders of new activities in such pursuits, and ensure that proper incentives are created and maintained for the acquisition of external funding.

The Consortium on Children, Youth, and Families (CYFC), University of Minnesota⁴

The Consortium on Children, Youth, and Families was established in 1991 under the leadership of University faculty, working in collaboration with community professionals.

1. Background

The basic motivation for the project was described by the leadership as derived from "a social/economic/political zeitgeist that has raised our collective consciousness, irrespective of our individual disciplines." (From "Guiding Principles")

The University's Institute for Child Development provided a strong foundation for the effort.

The leadership saw an unusual opportunity in that society's attention – often fleeting when it comes to even the most pressing issues – was clearly focused on issues having to do with children, youth, and families.

The major weaknesses were identified as the scattered nature of the university's programmes and the lack of connection with community agencies, policy-makers, and practitioners.

The "two cultures" phenomenon was seen as a threat: a deliberative university culture where knowledge is generated and disseminated, often in very traditional ways, and an action-oriented community culture of service-providers. The tension led to perceptions that the university was arrogant, and that its research was irrelevant to solving the real problems, and its education and training inadequate in preparing graduates for their actual work.

2. The Restructuring Process

The project was identified as one that central administration would encourage and support under its "Strategic Investment Pool" programme.

A planning retreat was held in 1990 with participation of 39 faculty members and 11 community representatives (selected by the Steering Committee). A set of guiding principles was adopted, and a strong call for further action was issued.

- What hindered? A general scepticism in the community had to be overcome. The university "talked a lot", but would it "actually deliver?" The fact that the university's own activities were scattered in a dozen or more units throughout the university, from the College of Education to Human Ecology, the Medical School, and the Extension Service, made bringing faculty together for more than inspirational meetings an important task. The "culture" of disciplinary isolation was a major obstacle.
- What helped? It was generally recognized, in the university and nationally, that the Institute of Child Development was one of the best in the country. There was great respect for the leadership of the consortium project because it was first drawn from this unit. Clearly the time was ripe both inside and outside the university. The enthusiasm of the originators caught on with a broad range of potential participants. Minimal as the funding from central administration was, it did help that the consortium had central sanction and support.

4 Information provided by the University of Minnesota

Regulation

The University of the Future will still have need for policies governing the conduct of its work. As in so many other areas, independence is important in regard to regulation, although general policies will, of course, have to be set by government. This will continue to place great responsibility on the board, the administrators, and the individual researchers for integrity, watchfulness and ability to spot troubles, if self-regulation is going to work and be allowed by society.

Conflict of interest will be especially important in interaction with the wider community, because university and community personnel, funds, facilities, etc. are likely to be intermingled as common agendas are pursued. The idyllic days when a well-funded extension service could just give everything away to the users are gone. The financing schemes that have arisen in support of joint university-community efforts do need careful oversight, if the University of the Future is going to be able both to provide effective knowledge and technology transfer and serve as independent arbiter of knowledge and as critic of society.

Conflict of Interest: From Recommendations by Task Force of the Association of American Universities (AAU, 2001)

The Task Force concluded that the problem is rarely a particular conflict itself (individual or institutional conflict of interest) – rather it is the question about what is done with the conflict....

The Task Force concluded that a university's institutional financial conflict of interest processes – for both financial holding-related conflicts and those involving senior officers – should follow a threefold approach:

- 1) disclose always;*
- 2) manage the conflict in most cases;*
- 3) prohibit the activity when necessary to protect the public interest or the interest of the university.*

A key goal is to segregate the decision-making about the financial activities and the research activities, so that they are separately and independently managed...

The partnership between research universities and their principal research sponsors – including the federal government – must be based on the conviction that universities are accountable for the research they perform. If research universities do not demonstrate their ability to maintain accountability for individual and institutional conflict of interest, more prescriptive approaches may well be pursued by either the executive or legislative branches of government, or both.

Personnel policies and practices

I have already stressed the need for protection of the university's scholars and scientists, if they are going to be able to pursue the taxing agenda that I have suggested, and do it with the kind of independence that is necessary to truly serve society. The University of the Future is going to have to deal thoughtfully with the challenge of developing procedures that combine protection with assurance of continued productivity.

In order for the university to pursue an appropriate agenda in its interaction with society, the scholars and scientists must be able to represent all major sectors of society, in cultural, social, racial, and economic terms. "Being able to represent" should include actual representation, not only for, but from a variety of groups in society.

What will happen to the traditional faculty role? Will what has in many ways been a single, if multifaceted, concept of the "faculty member" be preserved? I will only touch on what I see as the requirements of the kind of interaction with society that I am addressing in this paper, and not deal with the larger question of whether the triple-threat faculty member, performing teaching, research, and service, will be viable in the University of the Future.

It seems that the effective pursuit of the kind of agenda that I have outlined will require a division of labour.

The scholar/scientist will discover and, in interaction with the community, analyse and criticize. Taking research findings to a state where they can be translated or converted into use by and for the community requires a different set of skills. It is important that the latter role should be defined to emphasize interaction operating both ways, translating/converting discovery/analysis/criticism to community use and bringing issues and problems from the community to the researchers.

The university may be well served by giving a more definite expression to the latter role in its personnel system. (I am, of course, here ignoring great differences among types of interaction, ranging from technology transfer to policy interpretation, from clinical activities of various kinds to economic development). It is also possible that one and the same person at different stages of a career might be interested, and serve well, first in the discovery role and later in the role of providing actual interface with society.

Promotion and salary-setting procedures must be tied effectively to the definition of positions, and be based on regular evaluations of performance.

Information technology

Interaction and sharing of the kind I have discussed in this paper will undoubtedly be significantly affected by IT, and IT may well find new uses within the agenda I have outlined. For one thing, IT gives us the opportunity

to network more effectively, and in new ways, both inside universities and among universities, and between universities and the wider community. New methods and opportunities for data gathering, discovery, analysis and dissemination of findings are developing. Ease of access to information is being greatly enhanced. Since much of the interaction between the university and the wider community that we are talking about involves sharing and dissemination of information, it is safe to predict continued escalation of IT-based networking as "Moore's law" continues to apply with its regular doubling of capacity relative to cost.

Will there be a qualitative change as well in the interaction and sharing? Will the human interaction of the university representative to the community with representatives of that community be replaced by a more impersonal, albeit perhaps expanded, virtual interaction by computer? Here I can only raise the question, and leave it to the reader to do further conjecturing. In general, it is not safe to assume that IT will simply facilitate existing modes of interaction. The nature of interaction is very likely to change.

IT Network to Provide Access for the Community⁵

***Details on the Master Gardener programme:** The Master Gardener programme in Minnesota is an educational programme designed to train volunteers to help other people in their communities with horticulture. The programme was created in 1977 and is administered by the University of Minnesota Extension Service. Most of the 87 counties in Minnesota have active Master Gardeners. Volunteers receive professional training in home horticulture by university specialists in exchange for volunteer time. This training sets Master Gardeners apart from other home gardeners and allows them to be effective resources in their local communities. Working with local county Extension offices, Master Gardener activities benefit schools, community education programmes, garden centres, farmer's markets, historical sites, and many other programmes...*

Classes are held in the Twin Cities of Minneapolis and St. Paul, various other locations in Minnesota, and on the Internet.

***Food Safety Food Service Certification:** Every restaurant in the state has to have certified food safety manager on staff. Currently the University of Minnesota offers this training in traditional classrooms. However, the university is in the final stages of testing the online version of this programme. We anticipate the response to online training will be strong. It is flexible and food service workers don't work standard shifts. Food service also has extremely high turnover and the online training can be completed quickly if the facility loses their employee with certification. An employee can complete it within days instead of having to wait for the face-to-face course to come to their area.*

⁵ Information provided by the University of Minnesota.

The “culture” of the university

All the features of the University of the Future that I have identified come together in what we might regard as the “culture” of the university. For the university to serve the wider community effectively, this totality is important. Unless the board, the president, the administration, and a sizeable portion of the faculty and staff are imbued with a spirit of willingness to serve the wider community, the enterprise will not be fully successful. One of the many challenges of the University of the Future will thus also be to create such a spirit through its planning, priority-setting, reward system, budgeting, regulations, IT and personnel policies and practices.

“Hubs and spokes”

Finally, a few words about the physical structures of the University of the Future. I believe that we will continue to be well served by physical locations where scholars and scientists can work and interact with each other in real time in a collegial atmosphere, and where many disciplines are represented. The research university may survive as such an intellectual “hub” for discovery. I expect that the typical hub will also provide learning opportunities for students who would be apprenticed to the resident scholars and scientists, especially to learn what scholarship and science are about, and how research is done.

Needless to say, these hubs should have the characteristics of our finest campuses, with exciting and functional architecture and much green space!

In order to interact with the wider community, “spokes” will need to connect the university hubs with that community. These spokes may be physical locations, where university representatives interact with community representatives, but they will also increasingly be virtual networks through which the knowledge and understanding produced at the hubs will be translated and transferred.

I suggest this “hubs and spokes” model with some trepidation, because I am concerned that my University of the Future might be misinterpreted as a system burdened with heavy bureaucracy and rules and regulations. The hubs and spokes of the University of the Future must be organized to ensure both independence, room for, and ease of, innovation and entrepreneurship, and productive, and continually renewed, coordination and collaboration.

CONCLUSION

The exercise of trying to charter a University of the Future is exhilarating in many ways.

I do note that I have not been able to break away from much that is traditional, and that already exists. What I have actually done is, of course, first to re-emphasize the basic values of the university as it has emerged over the last few centuries, with much trial and tribulation, the values that are embodied in words such as “free and open inquiry,” and secondly to idealize and expand the land-grant tradition of service to the wider community beyond its traditional rural and agricultural boundaries. These values, and the basic institutional structures and policies that sustain them, will need to be preserved.

What is new?

What is new is mostly, perhaps entirely, expansion and systematization of structures, policies, procedures and activities that are already found in many universities. It is all based on my conviction that the University of the Future must, and will, be at once at the centre of society, of the emerging knowledge society, providing it with indispensable knowledge, understanding, and know-how, and independent enough from society to be able to be a true arbiter of knowledge and a critic. In order to serve in that demanding role, the University of the Future needs both an expanded and enriched agenda that does not shy away from the difficult and controversial issues facing society, and flexible structures and procedures that can accommodate continuing innovation and renewal.

How will we know when we have gotten there?

The Kellogg Commission on the Future of the Land-Grant University (2001) identified “a seven-part test” for what they termed “the engaged university”. This is a brief summary of the “guiding characteristics” that were identified:

- **Responsiveness:** a matter of asking the right questions and listening to the communities to be served.
- **Respect for partners:** a matter of working with the community to identify problems, seek solutions, and evaluate success.
- **Academic neutrality:** which I would rather call “academic objectivity – a matter of ensuring that the university’s resources are used appropriately in dealing with controversial matters.
- **Accessibility:** a matter of ensuring that our structures and practices are as transparent and as user-friendly as possible.
- **Integration:** a matter of combining the university’s missions in inquiry and learning with its mission in service.
- **Coordination:** a matter of making sure that the different parts of the university know what the other parts are doing.

"From The notion of engagement" (Kellogg Commission, 2001)

"From Executive summary"

"We issue this final letter with some sense of urgency and concern. Our message is not private pleading from a special interest group, but rather the public expression of our conviction that if this nation is to succeed in a new century, the covenant between our institutions and the public they serve must be renewed and again made binding."

...

"A New Kind of Public Institution"

"This Commission's prior letters have provided reasonable responses to that broad question. If the recommendations in our prior reports are heeded, the shape of today's university will still be visible in a new century, but it will have been transformed in many ways, major and minor. It will truly be a new kind of public institution, one that is as much a first-rate student university as it is a first-rate research university, one that provides access to success to a much more diverse student population as easily as it reaches out to "engage" the larger community. Perhaps most significantly, this new university will be the engine of lifelong learning in the United States, because it will have reinvented its organizational structures and re-examined its cultural norms in pursuit of a learning society."

"A new covenant"

"Thus for our part of the covenant, we commit to support:

- *Educational opportunity that is genuinely equal because it provides access to success without regard to race, ethnicity, age, occupation, or economic background;*
- *Excellence in undergraduate, graduate, and professional curricula;*
- *Learning environments that meet the civic ends of public higher education by preparing students to lead and participate in a democratic society;*
- *Complex and broad-based agendas for discovery and graduate education that are informed by the latest scholarship and responsive to pressing public needs;*
- *Conscious efforts to bring the resources and expertise at our institutions to bear on community, state, national, and international problems in a coherent way;*
- *Systems and data that will allow us periodically to make an open accounting of our progress toward achieving our commitment to the public good; and*
- *Intensive, on-going monitoring of the progress of the Kellogg Commission's recommendations."*

- **Resource partnerships:** a matter of properly combining funding for service activities from university, government, and private-sector sources.

Taken together, these characteristics help shape the culture that is necessary, if the research university is to serve the wider community.

What will wither away? Will the research university itself as we know it survive?

I think that what we have come to call “the research university” – or in the phrase used by the sponsors of this symposium, “the research-led university” – will survive for quite some time in a form that we will continue to recognize. To be sure, this institution has undergone, and will continue to undergo, much change. The question of the viability of the particular institutional configuration that we associate with the term in the United States (including such clearly extraneous activities as intercollegiate athletics) is being raised repeatedly, not least in connection with considerations of the impact of information technology. I have assumed for the purposes of this discussion that the University of the Future will retain the essential features of the current major American research university. But, I do want to stress that the impact of IT – with its potential for new networking and for unpacking responsibilities and activities – undoubtedly will be significant (and may well surprise us), and that many of the activities, policies and practices described are likely to be affected by it. Some activities will remain “real” in place and time, many others will be “virtual”. While many aspects of the research university will remain, the University of the Future will break some of the shackles of place and time!

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