

Adaptive Planning in a Chaotic Research Environment: Aligning Academic and Business Issues

Brian L. Foster, Provost Emeritus, Emeritus Professor of Anthropology,
University of Missouri

It has become a commonplace that higher education today exists in an environment of fundamental change that is often unpredictable (Christensen and Eyring 2011; Duderstadt 2012). It is not just that there is serious change underway; change in the research environment and other areas is strongly interactive, such that change in one area ripples through other areas. Formal planning will be especially important, given the volatility of the higher education environment, but planning as usual won't be effective, given that strategic planning is often seen in a rather linear manner—as something that keeps institutions on a fixed path (Academic Impressions 2013). Changes in the environment are often seen as emergencies which are seen as abnormal conditions from which we need to recover or get back on track.

Change—especially in the intermediate or long term—is not abnormal. Moreover, as noted above, it is multidimensional, with different kinds of change interacting in complex ways. Good plans must be dynamic and adaptive to accommodate the rapidly morphing environment. But equally important, they must provide direction such that infrastructure, human resources, IT capacity, and other critical elements—things that often require a long time and large investments to be achieved—are present to support high-impact research and other academic functions.

In this paper, I take a broad anthropological approach to examining how we can at the same time be adaptive and have effective, long-term direction, with particular attention to academic research. The relevance of Anthropology is that anthropologists routinely deal with extraordinary complexity: human evolution,

changing environments, fundamental cultural differences, differences in economic, social, aesthetic, linguistic, and political norms and much more.

Dimensions of Change and Volatility

Given that the change that is currently challenging Higher Education is multidimensional, it poses particularly difficult challenges to planning. It is perhaps useful to approach the issue in three overlapping steps: (a) external (environmental) and internal changes, (b) Higher Education's responses to these challenges, both on the business side and the academic side of the universities, and (c) adaptive planning in a chaotic environment. Because of the close connections among the many factors, and given that a simple, linear representation of the changes is not possible, the presentation will be somewhat redundant and circular.

External, or Environmental, Changes

Most (but not all) of the environmental changes have their direct impact on the business side, and they take several fundamentally different forms: very broadly, resources (core revenue, research funding, expenses), international environment, regulation and compliance issues such as export control, classified work, fiscal management, general accountability, IT changes, and relations with private business sector and other constituencies. There are many other significant areas of change, but to discuss each one would not be possible in this context. Those listed here, though, need special attention in relation to planning.

Resources, of course, receive a great deal of attention in the press, in policy discussions, and in planning on campuses. There is a great deal of concern about core institutional funding. This is about state appropriations for public institutions—a resource that has decreased steadily for more than ten years (Schulenberg 2012: 82-86), and there is little optimism that this trend will be reversed significantly in the foreseeable future. Philanthropic fundraising and endowment income are less important for most publics and, although they are significant for most institutions, they are not a major part of core operating funds even for most privates.

A major source of core revenue for virtually all institutions is tuition, which has become a policy focus in several ways. Tuition revenue is profoundly affected by current demographics (especially decreases in number of high school graduates in many areas), competition within the education sector, and the

changing distribution of potential students across socioeconomic, racial/ethnic, gender, international, and other categories. Moreover, tuition revenue is determined by a combination of the number of students and the level of tuition that they pay—the latter a matter of high visibility and political interest as affordability and access to higher education becomes an ever more important focus in political and policy arenas (Gardner 2014). In any case, there has been a strong trend for increasing tuition levels. Finally, student loan debt has become a very hot topic that could become a crisis should there develop a crash in the student loan business similar to that in 2008 in the financial industry—an issue that is of great concern to many in government and in higher education.

In the research area, resource issues are not just about decreases in funding (though there are serious concerns about this matter). In addition, there are many developments that restrict the use of funds. Priorities for research funding are changing, as reflected in distribution of funds across different agencies, in broader impact issues, and in recent congressional discussions about limiting the kinds of humanities, arts, and social science research that can be funded. Moreover, a very substantial amount of funding now comes from agencies such as Homeland Security, often in the form of contracts with specific deliverables. Contract work with the corporate sector has become an ever increasing source of research funding—again, with clear deliverables.

An ironic issue in the research area is that externally funded research and contract work—whether funded by government or from the private sector—often (one might say usually) does not fully fund indirect costs. Thus grants and contracts have to be subsidized by tuition, state appropriation, or other funding sources—in effect a substantial reallocation of core funds from their initial purpose (Lowry 2014). An interesting twist on the fact that F&A rates generally do not cover all indirect costs is that the problem of limited institutional core resources is exacerbated if the amount of funded research grows or is even held steady.

The international environment for American higher education is unpredictable but potentially of very high impact. One critical element is that the U.S. for cultural reasons does not generate a viable pipeline for people in the STEM disciplines, and a large proportion of students and faculty in science and engineering are of international origin. In addition, many Asian American students who come from recent immigrant families choose STEM fields and are very successful academically. But perhaps most daunting is the stunning investment that other nations (e.g., China, India) are making in higher education—on the one hand becoming ever more competitive with American institutions for students, and on the other hand, beginning to challenge America's prominence in research.

A significant international issue revolves around American security and intellectual property (IP) issues that touch on research. Although a substantial por-

tion of the STEM research workforce consists of graduate students, many students cannot work on projects which are subject to export control restrictions. Similarly, export control places strong limits on international collaboration/communication of U.S. researchers. Security and IP regulatory issues are of real concern with respect to ensuring our national security; but our interventions produce side effects that are controversial (e.g., embargoing dissertations and faculty publications). These side effects can have significant impact on other critical academic issues such as scholarly communication, peer review, and promotion and tenure.

Compliance and regulatory issues go far beyond export control to areas as diverse as conflict of interest, IRB, SEVIS, and HIPPA, and have required substantial staff support for the compliance functions themselves, significant time on the part of faculty and staff, and the constant risk of significant penalties should there be lapses. State regulations on universities offering on-line courses to students whose home is in other states provide an excellent example of the costs of being entrepreneurial (though a fix on this one is in the works).

Technology change is a key environmental issue for higher education—especially changes in information technologies. IT has fundamentally changed instructional delivery (e.g., Chowdhury 2014), management systems, research methods, and much more. For example, recruiting students, admissions, registration, and academic records are now supported by ERPs, as is the case with accounting, HR management (e.g., hiring, evaluations, payroll), space allocation,

and institutional research. Although such technology is often seen as a way of reducing costs, in general the IT systems are extremely expensive to install, maintain, update, and often to replace. Data storage issues have become daunting in several respects: for expense, for adapting as the technologies change, and for risk management (e.g., failure of a major data warehouse could be devastating).

Needs and demands of constituent groups has become one of the most daunting issues facing universities, given the diversity of these groups—alumni, legislators, athletic fans, students and parents, professional organizations, donors, business collaborators, to name just a few. It is critical that the many groups have different, often conflicting, demands—e.g., research vs. instruction, access vs. rankings, or diversity vs. privilege. One constituency is particularly relevant to this paper. Increased interaction with the business sector on its turf is a significant environmental challenge. Higher Education business practices are similar to those of the corporate business sector, but there is a major difference in how a business and the business side of a university are positioned: the academic side of higher education is largely about creativity—i.e., research, arts, problem solving (see Foster 2006). This creative environment builds on a mindset that is all about finding new ways of understanding, of managing, of solving problems—of getting out of the box. Research, high-quality education, service functions—all of the academic functions are about doing something that has never been done before...something that by definition can't be structured. The point is that the sole

reason for existence of the business side of the university is to support the academic side. This gives a critical perspective on academic business operations and on academic planning—on how one plans to do something that has never been done before... or how to plan to provide the resources/infrastructure necessary to do something that's not been done before. It is this interface between the business-side's responsibilities and the unconstrained creative environment of academic units/activities that sets the business side of the university apart from the business sector.

It is important to note that the business sector has a creative side, but this is not the core of the business practice in the same sense that it is in the academy. Clearly both the Universities and corporate businesses must adapt to the changing environment in order to survive, and such adaptation may even be a matter of creating new business models, products, and management processes. An especially interesting aspect of corporate creativity is product development. It is common for radically innovative product development in corporations to be separated from the management side of the business in a "skunk works" in which current design standards, cost issues, infrastructure, and other matters are kept from impeding creativity—from creating, say, a "new car" that is really just another Oldsmobile or Plymouth.

It is also important to note that the academic side of the university has its own regulatory/accountability processes to deal with—e.g., accreditation, peer review, rankings, IRB, and FERPA, though in the academic domain it is somewhat (if

not perfectly) sensitive to the kind of free thinking that is the heart of creativity. This is a key element in the difference between the academic and business side of higher education: the interface between operations, regulation, and so on is sensitive and must somehow align the two elements. But increasingly, there is political interest in regulating the academic operations in ways not done in the past—e.g., specifying educational outcomes, constraining research funding in ways that determine what kinds of research can be done, thus creating an environment that significantly hampers creative activity in all fields.

The issues discussed above are primarily grounded on the business side of higher education, at least with regard to the direct impact. It is important to note that a key difference between the business side of higher education and the private corporate sector is that most of higher education has not been driven by

a profit motive. This has changed significantly in recent years as universities are more engaged in economic development, in IP commercialization, in (hopefully) profitable on-line education, and in contract work. Economic development, contract work, IP development, and other matters bring higher education into direct interaction with the business sector on the latter's turf.

An interesting twist on this issue is the special place of basic research, which doesn't have an immediate, predictable ROI. This being the case, the private sector has all but abandoned basic research (e.g., the end of Bell Labs), which has been de facto outsourced to higher education and a few independent research organizations. Higher education now provides the subsidies that the private sector is unwilling to do. In addition, although many of the REALLY big IP opportunities come from important results in basic research, higher education is not

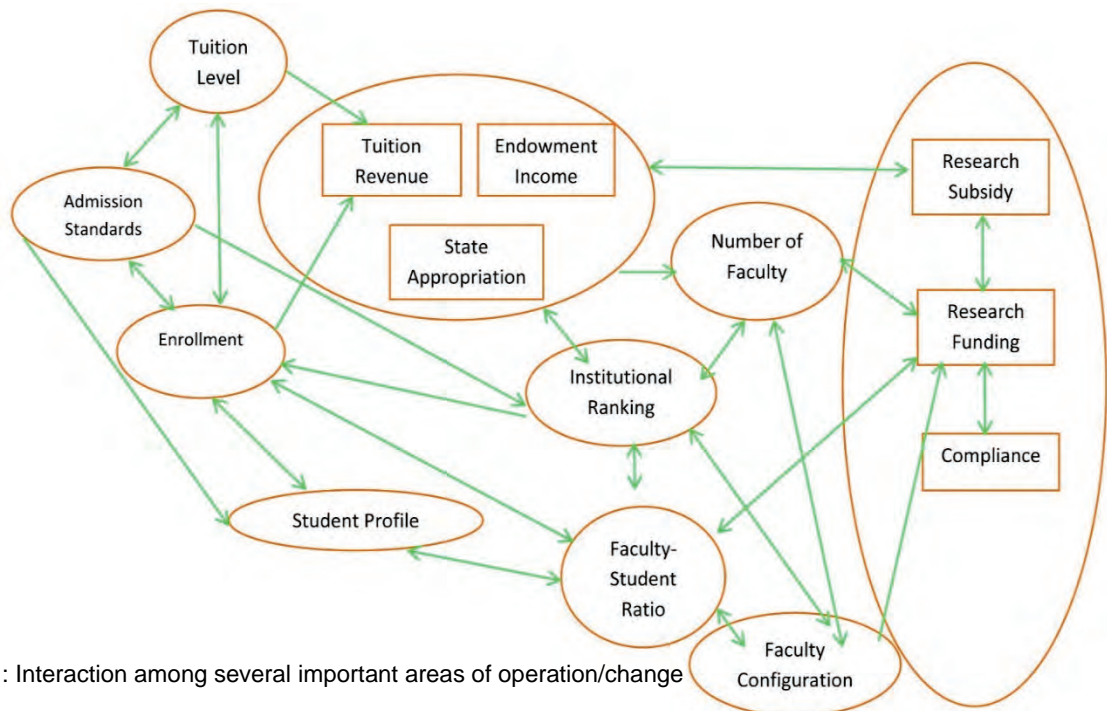


Figure 1: Interaction among several important areas of operation/change

well positioned to commercialize it—e.g., the costs of product development and the risks in protecting patents (e.g., from patent trolls). The convergence of public relations, politics, accountability, and related matters has come to affect finances (see above), enrollments, state appropriations, research funding, and much more. The point is that such issues can often hit a tipping point which could have game-changing impact on the fundamental business model of higher education, with profound effects on research (**Figure 1**).

Internal Change

Some of the most important change develops internally, though the complicated relations between institutions and their environments often make the internal/external distinction problematic. And the issue is made even more complicated by the differences among sectors. For example, much (perhaps most) of the major external impact is based on science and technologies that at the most fundamental levels were created by research universities. Thus, although the IT technologies themselves were not generally developed in universities, much of the underlying mathematics and science was.

That said, technologies have enabled extremely creative innovation in instructional delivery modes and other areas. Many of these educational applications were developed within universities, though it is important that corporate entities (e.g., Wiley, Pearson) are now playing a large part in their dissemination. And it is probably safe to say that the highest-level, most broadly used software for, say, simulation-driven hands-on learning classes will come from the

private sector, as will the most sophisticated technologies used in on-line learning (Chowdhury 2014). Similarly, we are seeing profound technology-driven change in scholarly communication—especially scholarly publications. The issue is too complex to address here except to say that the changes involve both higher education and the publishing industry, with significant impact on publishing (especially university presses), libraries, the peer review process, and much more. The importance of these changes is that the dissemination and archiving of research results is at the heart of what we do in the research arena (Foster 2012).

More firmly within higher education, a groundbreaking research result could fundamentally change a University's research plan—e.g., by opening up new opportunities for translational research, for commercializing IP that arises from the results, and/or opening up whole new tracks of basic research. These outcomes are among the best of all possible research results, but they can also be major challenges. To take advantage of new research paths, major investments may be required or, worse, major past investments may become irrelevant. In addition, the potential for extremely large financial returns from developing some resulting IP can be (is likely to be?) claimed by corporate players who will challenge the patent necessary for the IP development. The costs of defending potentially VERY valuable IP in a patent challenge can be millions of dollars.

A more long-term structural kind of evolution is that, although higher education is very discipline-grounded, the disciplines have been morphing for a long

time and they continue to do so. In some cases these changes may involve the emergence of new disciplines such as geospatial analysis, which involves the convergence of many disciplines and involves applications in areas as diverse as medicine, public health, journalism, law enforcement, and marketing. Moreover, some disciplines have merged and re-organized—especially in the biological sciences, which over the past several decades have seen merging and morphing of agricultural sciences, bio-engineering, medicine, microbiology, botany, biochemistry, and much more. Such changes involve significant adjustments to institutional structure (e.g., departments, colleges), to research infrastructure (strong links to the business side), to curriculum, to faculty socialization, to scholarly communication, to credentialing, to rankings, and to accreditation.

An important point to stress here is that planning for the unforeseen can involve potentially positive outcomes as well as negatives; not all surprises are bad news. But the magnitude of the positive challenges can be extremely large and complex, and if a university is to pursue such opportunities, a plan must be in place.

Higher Education's Responses to the Current Volatility

Perhaps the most important observation about Higher Education's response to the current changes is that little or no fundamental change has taken place (see Christensen and Eyring 2011). There are a few exceptions, perhaps the most visible being Arizona State University's dramatic initiatives in course delivery, marketing, the Starbucks project, enrollment

management, curriculum structure, strategies for getting research funding, economic development strategies, and structure of academic units. But for the most part, higher education's responses have been short-term efforts to mitigate the challenges, with the goal of protecting the status quo rather than a long-term strategy and action plan for adapting to the deeper changes. The measures taken on the business and academic side differ greatly, of course, but the interactions are profoundly important.

In any case, all of the above environmental issues have profound implications for the internal academic functions, and the academic functions pose a daunting environment for operations of the business side. A key element of all the above is universities' research and increasingly important relations with the business sector.

Responding on the business side

Responding to change on the business side, the big focus is on revenue and expense, though the latter is somewhat problematic, since most institutions have a very limited understanding of their costs. In fact, many conversations with provosts and other administrators indicate that serious cost accounting is rare in higher education. One reason is that it is costly to do real cost accounting, both at the accounting level and, even more, at the level of creating the necessary data base. But perhaps more important, it just is not in the culture of higher education. The one area where significant cost analysis is done is research, as part of the input for indirect cost negotiations.

Increasing revenue dominates most of the discussion about funding challenges on the business side, and the most common item for discussion is tuition and/or, for publics, state funding (both issues with very complex and conflicting engagement of constituents). Increasing tuition revenue can take two forms: raising the level of tuition or changing enrollment patterns (e.g., increasing numbers, changing the balance of in-state and out-of-state, changing the balance of graduate and undergraduate, recruiting full-pay international students, or changing the distribution across different disciplines). But any changes raise issues with how financial aid is configured (ultimately the discount rate), and many issues concerning costs arise. Perhaps the most critical issues related to tuition and enrollment patterns are (a) whether the growth is in high-cost or low-cost programs, and (b) whether the programs have capacity to take in more students. These issues overlap in complicated ways; for instance, it may cost more to add twenty students to a low-cost program that is at capacity (leading to a step function in cost) than in a high-cost program with excess capacity, for which cost may be essentially zero. This raises a very difficult area of cost accounting: marginal costs.

Inevitably, such discussions will include philanthropic fundraising. This is, long term, an important topic, but it is not a short-term solution for big revenue changes, and in any case, for most institutions, even very successful fundraising will provide only relatively small changes in the institution's budget. It is also important to note that fundraising is not without significant cost, especially for

an institution that does not have a robust structure in place.

Creating new revenue sources is the other topic that comes up frequently. The idea that on-line delivery of education could be a profit center is commonly raised, though some providers claim that on-line delivery is more expensive than traditional face-to-face instruction. Contract work often is mentioned—e.g., with corporate clients—but costs are generally not well understood, and pricing is problematic. Another commonly discussed approach is commercialization of intellectual property created by the university's staff, faculty, and students. Again cost issues—and risk of such things as patent trolling—are significant, and production of significant revenue is rare. Another important area for revenue creation is auxiliary operations such as book stores and residential life. Perhaps the main point here is that we need to be talking about not just revenue, but new net revenue (see pp. 26-27 on research funding).

The issue of savings almost always arises in these discussions. Perhaps the most promising are changes in administrative structures—e.g., shared services. Often major efficiencies can be achieved by fundamentally reengineering administrative systems (e.g., HR processing or academic support systems such as admissions). But many of the discussions are more vaguely focused on cutting certain support functions or eliminating degree programs. The latter rarely happens, and when it does, it tends to produce minimal savings, especially in the short term, since existing students must be served. In fact, many proposals for program elimination

focus on humanities and social sciences, which tend to be instructional profit centers (significant enrollments, many service courses, and relatively low costs of delivery—one doesn't save money by cutting a profit center). Merging departments and/or colleges or schools also arises in discussions about cutting expenses, and again, real savings tend to be minimal without fundamental changes in curriculum, instructional delivery, research, and other functions.

In any case, higher education institutions most commonly address the financial challenges by short-term measures such as keeping salary increases at a low or modest level (a source of significant short-term impact, since salary is a very big part of college and university budgets). Another common measure is to defer maintenance and needed renovation—an action that is not highly visible in the short term, but which can add up to catastrophic consequences if pursued for a long time. A very common strategy, sometimes linked closely with enrollment strategies, is to hire more adjunct faculty, who tend to be paid less and teach much more than regular faculty—a strategy that has received a good deal of national discussion recently, both positive and negative.

Changing technologies have been adopted in many areas on the business side. Not everyone is a fan of ERP systems, but they have been very broadly adopted and among other benefits, they increase universities' ability to integrate data from HR, facilities, student matters as diverse as admission, financial aid, and academic performance. Electronic Medical Records have brought important

changes to health care delivery. And social media has changed branding and marketing in virtually every corner of the university. Costs, risk management issues, rapid and often fundamental change, and strong opposition to certain technologies by some key constituencies pose daunting challenges, but overall the effects have been positive.

Compliance and regulatory requirements are not issues that can be avoided for the most part. The risks of failure are great, including public relations, potential civil suits, and severe penalties from regulatory agencies—e.g., financial penalties, loss of certification, or loss of research or other funding. That being the case, institutions' investment in compliance tends to increase constantly. This is an outcome that leads to more general conflict between the academic and business sides of universities, since it increases administrative costs in ways that often are not transparent and come at the cost of cuts (or lack of new investment, salary increases, and more) on the academic side.

Responding on the academic side

Responding on the academic side of higher education is dramatically different from the business side in part because it is embedded in centuries of tradition (highly sacred rituals that drive many behaviors and practices), accreditation, and a long list of other conditions. But as noted above, the most important issue is the underlying fact that the academic side of the university—certainly research and arts, but also instruction and many service functions—is primarily about creativity, and a closely related sacred idea is

about academic freedom and faculty control of curriculum and research agendas—all very important ideas, even if sometimes used in ways that are not useful (especially from the business perspective).

Finding new revenue is probably the most important idea that arises from faculty—although it's also important to note that few faculty have a deep understanding of how revenues are generated. And most faculty, in line with most academic administrators, have little sense of the complexity of cost issues. Nevertheless, it is often the revenue side that dominates the discussion on the academic side. Many of the issues discussed above (i.e., regarding responses on the business side) are equally applicable for the academic side, though complicated by the highly principled ideals and practices of the centuries-long academic traditions.

Finding ways to cut administrative costs is another issue that arises frequently. This idea is entirely in keeping with the point that the university's or college's reason for existing is academic, and administration's function is to support the academic side. This concern has been fueled recently by media coverage of some research showing that in recent years, administrative positions have increased faster than faculty—a significant issue from all perspectives. Certainly the goal of cutting administrative costs by system redesign, shared services, and other initiatives (see above) are shared with administrators, though the precise content may not align so well. It is very common for faculty to have only limited understanding of various administrative

functions or of the administrators responsible for them (as, it should be said, is true for many people on the business side who have limited understanding of functions, underlying mind-set, and focus on creativity on the academic side).

Focused investment in a limited number of strategic areas is another idea that arises in the academic side, generally with administrative buy-in. Such discussions usually focus on areas of strength and, correspondingly, at least some disinvestment to provide funds for the focused areas. Such ideas of focused areas most often are based in research, but have strong links to philanthropic fundraising, faculty hiring, state funding, corporate partnerships, and institutional stature. Although the very general idea of focus and supporting strengths is appealing to most academics, the actual implementation usually runs into resistance very quickly. One of the main impediments is the faculty focus on disciplines and the fact that many focus areas will be interdisciplinary. Some of this resistance is grounded in highly principled commitment to the disciplines in which faculty were trained, socialized, and in which they advanced their careers; but much is also based on protecting turf of departments and colleges.

Gaining efficiencies in delivery of curriculum seldom arises in faculty discussions—e.g., increasing the number of cross-listed courses, eliminating redundant courses or program elements that overlap multiple programs (e.g., research methods). Such matters run immediately into concerns about academic freedom and faculty control of curriculum—and, of course, usually unmentioned, issues of

turf protection, which often are incentivized by budget processes, space allocation, and other business practices. Occasionally faculty will lean favorably to reducing or eliminating programs that just don't conform to their mind set—e.g., the unfavorable opinion those in a basic research area often have for applied programs in the same general area, and vice versa. Again, such issues are related to highly principled commitment to and belief in the underlying ideas of a discipline—and of turf protection or even expansion.

The international dynamics have become influential in day-to-day operations, in determining the vision for our future, and in creating a daunting competitive environment. Many of our academic moves internationally have to do with recruiting international students for reasons outlined above—e.g., to create a viable STEM pipeline and to generate tuition revenue. The dramatic growth of investment in higher education around the world will make the international competition for these students a major issue in the future. Ironically, there is a strong focus on integrating the international students into American universities and getting them functional in English, while American study abroad programs are far less likely to stress language competency and social/academic integration in the foreign university. This is an imbalance that will have a strong negative impact on the U.S. global positioning in the future.

Global collaboration—and competition—in the research domain is one of the most important elements of the future success of the U.S. Many related issues have been mentioned above—e.g., the

negatives include export control and strong investment in research by China and India and elsewhere. Many universities have strongly supported international research collaborations (e.g., conferences, research time abroad for faculty and students) but they are in the early stages of development, and their political, policy, and public relations future remains uncertain. The only thing that is certain is that research in many fields in our universities MUST develop effective international collaborations/competitive positioning if it is to be effective over the next few decades.

Compliance and regulatory issues are extremely relevant to the needed progress in international effectiveness, on both the research and educational side—e.g., for economic development and medical care, as noted above.

In addition, the regulatory, compliance, and accountability issues on the academic side raise critical challenges. As noted above, compliance on the business side is often seen by faculty as a negative, but accreditation and other academic issues are often seen as opportunities for leveraging more resources. For example, losing accreditation in a professional program because of not meeting certain regulations is just not an option.

Just as accreditation can provide opportunities, political and other constituent groups can be a valuable resource, but they can also pose regulatory, funding, and other restraints that are damaging to higher education. Such restraints may stem from principled, but controversial, policy issues. Or they may stem from fiscal or other interests of a specific group.

Or they may stem from raw politics. Regulatory and related constituent issues are among the most critical challenges we face in navigating our chaotic environment—issues for which most universities have strong if not always successful assets.

Changing technology has impacted academics in many more ways than can be addressed here—in instruction, research, and in the many support functions like campus IT services.

The increased emphasis on hands-on, active learning is an important link to technology. Clearly there is increased pressure to prepare students for jobs or careers, and practical application of what they learn in classrooms is highly valued, as is providing students with high-level analytical and problem-solving skills. And the shift toward the flipped classroom, in which interactive learning is a key element, further strengthens the

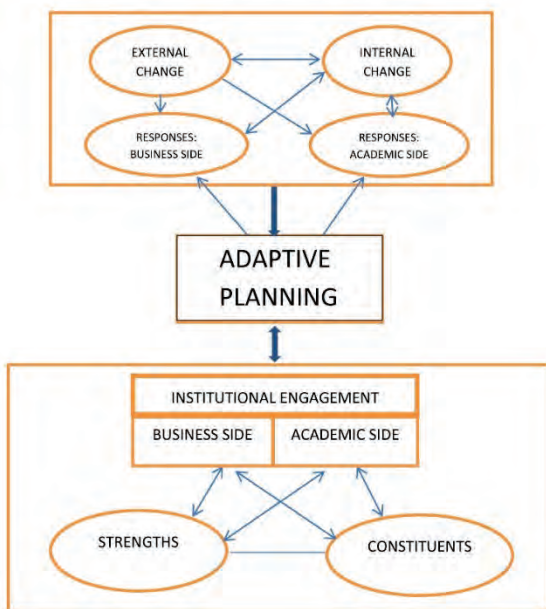
move to greater degree of hands-on learning. It is difficult to make a negative argument about hands-on learning...except that it is very expensive to deliver in most cases, among other things requiring a great deal of faculty time—a problem that can be mitigated by technology.

Summary: Aligning the Business and Academic Sides of Higher Education. The academic and business sides of higher education are like two different planets in the sense that they are intimately connected, but with underlying dynamics that are not just different, but often contradictory. The business side is very complex given the many-dimensional connections with the broader business, political, policy, demographic, and other elements of the environment, but it is highly structured as is any business operation. The academic side, though, cannot be structured in the same way, given that its main purpose is creativity—doing things that have never been done before—which is done, ironically, in an environment buried in centuries of tradition. But that said, as indicated above, creative activity can't take place without adequate infrastructure, which must be created and built without knowing just where the academic activity will go.

Thoughts on Adaptive Planning in a Chaotic Research Environment

All of the above provides context for addressing adaptive planning in a chaotic environment. Clearly planning cannot be a simple, linear, fixed set of priorities that are associated with resource development and allocation. Nor can we do comprehensive, highly accurate models of the future to inform the investment in people, allocation of time, development

Figure 2
Adaptive Planning Graphic



of curriculum, management of research and/or instructional capacity. Uncertainty is everywhere and can pose both negative and positive surprises—challenges and opportunities. Adaptive planning must address both in an on-going, responsive way.

What follows is a set of thoughts on adaptive planning but, as a matter of principle, no straightforward, clear process can be laid out. Three guiding principles at the highest level begin to define domains in which the planning will occur. The plan itself must be layered: at the highest level will be what is often called mission and vision, which determine where the institution is going. Then, to achieve the vision/mission will be broad goals, which will have operational outcomes; then there will be objectives that will have to be met to reach the goals, tactics for reaching the objectives, and a detailed action plan for implementing the tactics. The number of levels and the terminology are not so much of importance as that the plan be layered such that the higher level elements (vision, goals) are fairly long-term (e.g., years, even decades), while the lower-level elements are shorter term, getting down to the action plan, which changes day by day.

Ultimately, the different-level elements of the plan must be aligned/adjusted to the environmental dynamics that were described earlier in the paper; accordingly, environmental issues will have to be broken down in various levels. For example, for revenue elements of the plan, it will be necessary to have a prediction of where certain kinds of revenue are likely to go over the next decade or more in order to address vision and broader

goals; but shorter term trends also have to be considered (say, three to five years at the objective level) and year by year, or even quarter by quarter for tactical and action-plan level planning. Similarly, other dimensions of environmental change will have to be aligned with different levels of the plan—e.g., political dynamics at the long-term national and state levels, the immediate election results, and session by session legislative trends. Other dimensions would include major policy issues; the student market (including demographics); the competitive environment for student recruitment, research grants, etc.; the dynamics of the regulatory environment; and the dynamics of scholarly communication.

Guiding Principle 1: Institutional Strengths. The most important guiding principle is to build the plan—the priorities—on institutional strengths. If the point of the plan is to take the institution to where it wants to go, then building on institutional strengths is the most likely way to get there, the end goal being to position the institution favorably in relation to other universities and other kinds of competitors. Similarly, it is critical to position the institution such that it is viewed favorably by its many constituencies (see Principle 2). Strengths can mean many things, even for institutions that are very similar: even for constituent groups for very similar institutions, the idea of strengths has extraordinary variety, to the point that strengths in one institution would be weaknesses in another. It is critical to be clear that strengths are not defined as highly ranked programs, though such programs may be an element in de-

fining strengths. That said, the institutions that are represented in this retreat are all major public research universities, and there will be significant overlap in the idea of what is a strength. A few examples:

- A record of high-impact outcomes in a particular area, which will occur most likely in research. High impact outcomes are what we want, but as discussed above, they may pose opportunities or challenges (see p. 29).
- A forward-looking strength might be in emerging areas which are not of high prestige today but for which the institution is well positioned—e.g.,
- Emerging high-demand areas for academic credentials—e.g., in a profession such as Medicine, or in interdisciplinary technical areas such as informatics;
- Emerging science areas that are the result of the complex dynamics that are operationally morphing the disciplines (see p. 30).

Guiding Principle 2: Constituent Expectations, Demands, and Needs. A second guiding principle is to systematically align the plan with the expectations of the many external constituencies. Alignment of the plan with constituents' desires must be done holistically, not taking each constituent alone, but considering how the many demands and expectations come together: complementary, overlapping, inconsistent with, or irrelevant to, each other. The constituencies of a research university are extremely diverse, ranging from legislators, donors, parents, employers of graduates, professional organizations, corporate partners, alumni, and much more. The key is to identify

their needs and expectations and map them on one another to see patterns that can be in some way used strategically. An important footnote to this matter: it will be critical to work with non-traditional constituents whose interests, political positioning, and other properties can help build on the institution's strengths—constituents such as large corporations, government agencies, beltway bandits, national labs, and economic development agencies.

As with the strength areas, the constituents' needs and expectations will vary according to the level of the plan that they engage with: e.g., a long-term emphasis on biomedical research, short-term hiring of graduates in certain fields, building a new stadium to enhance the stature of athletics over the long term, or giving a small one-time amount to go to the president's discretionary fund. Another kind of example would be a dean's advisory board that strongly advocates for a doctoral program in a particular area. Another example might be an influential legislator who is an alum and who has a broad agenda (say, in health care, economic development, or the arts) who needs a major institutional investment to move his/her agenda forward. A key point here is that a very high-capacity donor, a powerful legislator, a highly committed alum with little financial capacity all fit into the picture at different levels of the plan. There is no clear way to build such dynamics into the plan, but the plan will not be a plan unless these dynamics, in all of their complexity, are systematically considered.

Guiding Principle 3: Engaging the Institution Broadly. A third guiding principle

is to foster an extremely broad institutional perspective and engagement. In some ways, this is similar to finding a direction that meets the needs of different external constituents. Thus, just among faculty it is critical to cross the boundaries of the academic disciplines and the closely associated organizational units like departments, centers, colleges, and schools. But in addition to the disciplines themselves, there are the broader, highly influential groups of faculty such as those in basic and applied research and academic vs. professional. But this is only the academic side of the organization; there is also the business side, including budget and fiscal management, facilities, enrollment management, government relations, research administration, fundraising, economic development, human relations, hospital administration, and much more. And then there is athletics. It is not reasonable to expect that all of these groups will come together in total, passionate agreement about the institution's direction/plan, but strong push-back from key elements of the institution is likely to severely impair the chances of reaching the goals of the plan.

My own prejudice on this matter is that the key to engagement is to have real discussions, not just show and tell, to bring together people who are positioned very differently and who have different perspectives. Real discussions will get the disagreements, value differences, and special interests on the table so they can be dealt with. There will be significant ideas that will meet opposition strong enough to prevent them from being implemented. And reality is that it will sel-

dom happen that everyone agrees on anything, and some actions will have to be taken about which there will be disagreement and/or opposition. A critical element of such discussions is to systematically consider the incentive structures put in place by, say, facilities assignments, budget, P&T, curriculum, teaching load, and other operational elements (some of which may come from outside the University, such as accrediting bodies, professional associations, and corporate partners).

Aligning the Principles, the Plan, and the Environment. All of the external and internal change facing the institution MUST be figured in such that it is feasible to move forward, building on the first three principles. There is no point in building on strengths that require massive investment that the institution cannot afford. By the same token, no strength could go forward if there was no faculty interest and influential donors and legislative constituents were strongly opposed. In fact, all of the external change (i.e., the changes discussed above as well as the institution's responses to date) must be systematically built into framing the first three principles and taking the next step to vision and goals. And this must be done in a systemic way that takes into account not just each factor on its own, but the complicated interactions among the many factors. Thus, for a simple example: the size and nature of the student body, curriculum, faculty profile, public service, professional engagement each impacts faculty workload and productivity rippling over into grant funding, publications, IP development, and facilities (e.g., see Figure 1). And it is

all affected by state funding, regulatory burdens, salary competitiveness, and effective support from staff, post docs, and graduate students. Again, the point is that the external influences must be mapped systemically onto the priorities/goals that are crafted with reference to the three guiding principles. Research cannot be separated from the broader institutional (or broader Higher Education) dynamics.

An obvious, but sometimes overlooked, requirement is that there needs to be an implementation plan that is closely aligned with the higher levels of the strategic plan. This may consist of bringing together the plan—say, the objective, tactic, and action plan levels—which must be structured to reach the goals and objectives. Clearly, there must be evaluations and accountability at all levels—and clearly, the levels cannot be separated in this accountability process. There are countless reasons the plan could fail. One, of course, is that it just didn't make sense. Another is a fundamental change in, say, state appropriations. Another would be regulatory changes that preclude some of the necessary actions to reach the objectives and goals. Some could be long-term disruptions, and some could be short-term. The important point is that all of this **MUST** be a core element in the planning process.

A critical point about my representation of the environmental changes, about higher education's responses, and examples about the planning process: these **MUST NOT** be seen as anything other than consciousness raising. The environment differs for every institution; the responses differ for every institution. The

most that can be made of the specific information is that it provides the first steps for mapping the particular institution's environment, linking it to the broad direction it wishes to take, and creating a viable plan for implementing the goals to get to where the institution wants to go.

Finally, I need to come back to the point that this paper is about research. The main point is that research is deeply embedded in the broader Higher Education dynamics. Like other elements of Higher Education, it cannot be seen as separated from fiscal, political, regulatory, instructional, facilities and other elements of the university—and of Higher Education broadly.

References

- Academic Impressions. Meeting the Challenge of Program Prioritization." *Monthly Diagnostic*, April 2013.
- Christensen, Clayton M. and Henry J. Eyring. *The Innovative University: Changing the DNA of Higher Education from the Inside Out*. San Francisco, CA: Jossey-Bass. 2011.
- Chowdhury, Tradib R., Ed. *The Flipped Classroom: A Selection of "Inside Higher Ed" Articles and Essays*, April 2014.
- Duderstadt, James J. "Creating the Future: the Promise of Public Research Universities for America." In *Precipice or Crossroads?*, Ed. Fogel, Daniel Mark and Elizabeth Malson-Huddle. Albany: SUNY Press, 2012. Pp. 221-240.
- Foster, Brian L. "From Faculty to Administrator: Like Going to a New Planet." In *Transitions Between Faculty and Administrative Careers*, Ronald J. Henry, Ed. San Francisco: Jossey-Bass, No. 134, Summer 2006. Pp. 49-57.
- Foster, Brian L. "Scholarly Communication in the Age of New Media." In *Information Systems as Infrastructure for University Research Now and in the Future*,

- Ed. Mabel L. Rice. Lawrence, KS: University of Kansas Merrill Advanced Studies Center, 2012. Pp. 46-54.
- Gardner, Lee. "Colleges Face a 'Tough Love' Problem." In *Chronicle of Higher Education*, June 19, 2014.
- Lowry, Judy. "High costs of research at universities made worse by funding gap." Eurekalert.org/pub_releases, January 9, 2014.
- Schulenberger, David. "Challenges to Viability and Sustainability." In *Precipice or Crossroads?*, Ed. Fogel, Daniel Mark and Elizabeth Malson-Huddle. Albany: SUNY Press, 2012. Pp. 79-117.
- Selingo, Jeffrey J, Editor. *The Innovative University: What College Presidents Think About Change in American Higher Education*. *Chronicle of Higher Education*, 2014.