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Open Access to Technology: Shared Governance of the Academy's Virtual Worlds

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Abstract

Information technology (IT)—hardware, software, and networks—is enormously important in the daily lives of everyone on college and university campuses. Yet decisions about academic IT are usually made by a small administrative team with almost no faculty input. This can lead to policies and priorities that poorly serve pedagogical and scholarly needs, and it is often actually an inversion of the traditional academic division of responsibilities as set out, for example, in the *1966 AAUP Statement on Government of Colleges and Universities*.

This essay examines some of the assumptions and traditions behind the IT governance structure currently prevalent on so many campuses and suggests some different perspectives on these issues. These alternative ideas then suggest a new approach—similar to, and in fact supporting, the open access movement for scholarly products but centered on the openness of the IT infrastructures themselves of college and universities.

To clarify the foundations of this new model of shared IT governance in academia, the essay states two important new principles: the principle of academic network freedom and the principle of shared academic network governance. These principles can clarify the appropriate roles of the various actors in university governance and give guidance about how to implement new governance models.

When faculty from different fields and institutions get together, their conversations form something of a

random sample of issues currently important to the professoriat. One topic is hugely overrepresented in these samples, in my experience: information technology (IT) woes. IT is one of the most common sources of problems for the academic community, but improving the state of IT governance behind these complaints does not get much attention from official faculty organizations such as senates and the AAUP. This is perhaps because, with the exception of computer scientists,[1] we tend not to consider IT to be central to what we do in our respective disciplines. Yet, I argue in section 1 of this essay, policies, practices, habits, and attitudes toward IT will only become more intertwined with what we *all* do, regardless of our particular discipline in the academy.

In section 2, I give a list of some of the concerns about university IT I have heard as chair of the Information Technology Board (ITB), a committee reporting to the faculty senate at Colorado State University, Pueblo, and charged with representing faculty to our IT services. The purpose of this litany of doom is not so much to dwell on the negative as it is to get some feeling for the breadth of faculty concerns affected by campus IT infrastructures.

In section 3, I explain some of the roots of the current situation, in the hope that knowing the causes may help us more effectively bring about change. It is my contention that most of these root causes result from certain widely held beliefs that are based on scant facts or are at least egregiously exaggerated. I provide in this section some alternative perspectives to these generally accepted myths.

In section 4, I propose a better approach toward campus IT, building in part on some of the alternatives just mentioned and in part on two new foundations visited in this section: open architectures and free software. I spell out here the *principle of academic network freedom*, which codifies the openness that I believe academic networks need to thrive.

Section 5 makes explicit the analogy between the openness toward technology that this essay advocates and the openness toward the products of scholarship that is called the open access movement.

Finally, in section 6 I suggest some specific first steps we faculty can take to improve our campus IT environments, and some structures we can set up to preserve any gains we may make. These steps and structures are suggestions to help serve the *principle of shared academic network governance*, stated in this section, which makes concrete the ideal for which we are struggling.

1. Future Directions and Growing Importance of Academic IT

On a basic level like that of classrooms with chairs and black- (or white)boards, IT is a part of our daily academic lives, often an enormously beneficial part. With computer networks the obstacles to storing, searching, and sharing information—tasks central to the academic project—can seem almost to disappear.

But beyond these mundane uses as some sort of supereffective pen, paper, and filing cabinet, IT systems allow new types of pedagogy: interactive textbooks in math or lab reports in chemistry, statistics students who work during class time with real data sets, class collaborative texts built as a wiki, use of audio and video recording, editing, and playback to enhance students' assignments, and so on.

Another "innovation" that has recently appeared in mathematics departments such as my own is online homework in lower-level classes. This is provided by textbook publishers—at a considerable cost to the students, which is often incorporated into the exorbitant cost of the associated textbook—and gives instant feedback to the students as they do homework problems. Not insignificantly, these tools also free the instructor from the tedium of grading extensive homework papers, so long as the homework is exclusively of a rote, algorithmic nature whose answers are single expressions that can be mechanically judged as simply right or wrong. Since the introductory classes are often taught by contingent faculty who are paid so little for each class that they must teach many sections to make ends meet (and since enormous pressures in these types of classes—starting with the educational philosophy of No Child Left Behind—has pushed instruction to center on turning students into rote algorithm-followers), the time saved by these online homework systems is a lifesaver for many a swamped instructor.

Going even farther in the direction of computer delivery of instruction, there is the looming threat of online or hybrid courses and even entire degree programs. I say "threat" because these new delivery modes may offer wider access to higher education, but they certainly challenge the primacy and methodologies of more traditional higher education. Massive open online courses (MOOCs) or smaller relatives are only possible because of computer networks and the processing and interactivity available at the edges of these networks; we more traditional faculty may not eagerly await their growth and success, but the possibility that they may provide a meaningful education certainly depends in large measure on the details of the IT infrastructure they employ.[2]

Even in the context of purely traditional class structures, faculty members are finding their campus networks to be an enormous convenience in getting announcements to, and feedback from, their students. Readings (including ones with copyright restrictions on distribution), homework assignments, quizzes, and other materials can be made available to the students through the campus network. Provided that sufficient individualized access control is enforced, students can also get individual comments on their completed work and full lists of the grades for all their assignments through the network. One way this is happening is by a strong encouragement (or requirement, at some institutions) for all courses to use a particular learning management system (LMS) such as Blackboard. (Which is an odd development, given that the great majority of these communication and interaction tasks are simple applications of the basic structure of the World Wide Web: it is therefore rather unclear why we should use these heavyweight and often expensive LMSs.)

In addition, there is the relationship of what we do with IT on campus to the new, more networked, mobile, IT-savvy lifestyle of today's students. If this generation's primary method of acquiring information and communicating with others is over the network, we may want to adapt some of our delivery strategies to this new reality—perhaps not all; resisting some modern trends in favor of more traditional approaches may be useful (although resistance may be futile…).

Finally, just as a literature course may teach students how to do close reading and write well, or a philosophy class may teach general critical thinking skills, or a math class general problem-solving strategies, so can many of our classes teach important general lessons about living in the modern, networked world—but only if we use these new technologies in responsible, mature ways on our campuses.

For this last point, I am suggesting that we can use the IT infrastructure on our university campuses to instill certain habits of mind in our students, habits that are particularly relevant in the modern world. Some of these would be knowing how to search well (the flip side of the modern ease of plagiarism) and to evaluate the reliability of Internet information resources; understanding security and privacy on networks, how to get them and when they are important; knowing how to share digital media, even when different formats are employed by different users; noticing when a simple task may be more easily done on a computer than by hand, and having some idea of how to do it.

2. Problems

Here is a selection of the complaints I have heard from colleagues at my own and other institutions.

1. The following are not available when needed:
    - the network (campus or external)
    - printer(s or other hardware)
    - particular software required for pedagogy or scholarship
    - some important incoming e-mail
    - campus website
2. Data (e.g., files from an office computer, backups, or shared files) are lost.
3. Repairs are slow to the point of stopping other activities.
4. Mailboxes are full.
5. The size of e-mail messages is limited.
6. Getting content onto a website is complex, slow, or impossible.
7. No specific commitment is given on timing of upgrades or repair, or such commitments are broken.

8. Malware (the computer security term for malicious software, including viruses, rootkits, botnets, keyloggers, Trojan horses, etc.) infests office or lab computers.
9. The layout of, and access to, computing facilities such as computer labs, "smart" classrooms, or other specialized hardware or software is pedagogically poorly designed.
10. Staff with particular expertise (or generally able to answer basic questions at the help center) are unavailable or profoundly overworked.
11. Decision-making processes are upside down, with faculty minimally involved in, or never consulted regarding, decisions about:
    - what software may be used for pedagogy or scholarship
    - what hardware may be purchased or hooked to the network, for pedagogy and scholarship
    - how faculty and students may access their IT resources
    - what will be on the campus website(s) (usually based on treating the web exclusively as a marketing tool, restricting content to promote "brand maintenance," privileging style—colors, logos, standard page layouts—over content)
    - priorities and goals for IT services, and how to use resources to pursue them—for example, setting "all campus courses should use Blackboard" as a top priority without asking faculty if they want that particular LMS (or any at all!), and then negotiating multiyear contracts with the provider based on this goal with no faculty input on the terms and prioritization of different parts of the proposed contracts
12. Services are centralized, for example:
    - moving hardware (printers, computer labs, high-end processors or display devices, storage, etc.) out of individual departments or academic buildings into central IT spaces (which always results in diminished use of these resources)
    - similarly moving (or firing) IT staff with specialized, field-specific knowledge
    - taking control of campus websites away from the people who make the content (the faculty and students)

    Or sometimes these services are simply eliminated.

3. Some Roots of These Problems, and First Responses

I contend that behind these problems are a series of widely believed myths.

Cost

There is a widespread belief that IT is a major expense on the order of new buildings or other large changes to physical plant.

While (certain small) aspects of this belief are true, it is for the most part false: Moore's Law and the faster version that applies to cost of storage[3] mean that modern computer hardware is fantastically powerful at very low cost. The meaning of "low cost" depends a great deal on context, of course, but a college's entire hardware replacement and upgrade budget, for example, might be in the same order of magnitude as the salary of a single assistant coach in the athletic department. And an official campus policy that limits faculty e-mailboxes to one hundred megabytes can seem a little strange when one realizes that this seriously impedes student-faculty interaction and faculty-faculty collaboration but represents a one-time investment of a few dollars in hard-drive (HD) capacity per user: HD prices at this moment run around five cents per gigabyte (see any online computer hardware retailer).

Market Fundamentalism

Another widespread fairy tale is that "the market knows best." We are all familiar with the dangers of this neoliberal ideology for the corporatization of academia (and in many other aspects of modern life). In the IT sphere, it has led to a reliance on commercial software, often in the belief that the bigger the corporate provider, the better off we users are likely to be.

While products from nearly monopoly-scale corporate sources can have certain advantages, they also always have significant disadvantages, some of which I have described elsewhere.[4] I will not repeat that entire discussion here, but suffice it to say that for both principled and practical reasons, academia is a perfect venue in which to take advantage of IT solutions built according to other social and economic models—as the academy itself is.

Leave It to the Professionals

A third myth is that there is an insurmountable gulf in knowledge and expertise between IT staff and faculty, which implies that only the IT professionals are capable of making any decisions about IT systems.

I believe that this is often a mixture of intimidation (not always intentional) by the staff and fear

(rarely warranted) by the faculty. Like experts in any advanced, technical field, IT experts speak in a sort of code with specialized terminology and abbreviations. When they use this terminology in conversation with nonexperts, it can simply shut down the discussion. But if faculty can stay current with the rapid expansion of our own scholarly disciplines, and expect our students to learn quickly the new lingo in our classes, surely we can easily master enough of the dialect to make meaningful contributions to IT decisions.

The actual situation with professionalism is really the precise opposite of this myth: IT staff certainly do know their specialized field of hardware and software for networks and individual machines, but faculty nearly always know far better the IT that matters to the scholarship and pedagogy in their fields. In my experience, there is only one situation where IT staff have the knowledge to lead rather than to follow in choosing software and hardware for research and teaching. That is in the area of general pedagogical IT, at colleges and universities lucky enough to have an "Instructional Technology Center" or similarly titled office: often these centers are filled with highly expert staff who do know more about new technologies that are generally useful in pedagogy. They are often also excellent communicators able to teach old faculty new tricks despite the barriers of terminology, impatience, and fear.

The above are myths common in the community in general, but other beliefs within the IT subcultures on our campuses and in the wider world also lead to many of the unfortunate outcomes mentioned in section 2; here I shall describe two of them.

Black and White

The first of these IT-internal beliefs is that the best way to run an IT installation is with *whitelists*, not *blacklists*. These are terms from the computer security field, where blacklists are the lists of specific programs (and pieces of hardware, network configurations, IT use-cases, network sites to which one might want to connect, etc.) forbidden in an IT setup where otherwise everything is permitted to the users. The alternative, whitelists—the lists of specific IT components permitted in a system where everything is otherwise forbidden (sort of an "everything that is not compulsory is forbidden" model, to misquote *The Once and Future King*)—is what is in place across most campuses around the country.

The problem with whitelists is that are by design antithetical to innovation: only the uses that the IT staff (notice, *not* the people doing the actual pedagogy and scholarship) has thought of and planned for are allowed. Blacklists can instead permit all future good ideas, excluding only the particular bad outcomes that must be forbidden.

For example, the whitelist approach to the Federal Educational Rights Privacy Act (FERPA) consequences of student work and grades residing on a professor's computer is to list the particular uses that the professor may make of his or her computer, in person and across a network. The blacklist approach is to

require security of the actual sensitive information, by some sort of software protections for example, but to allow by default all other, noninfringing uses of the computer and its network presence. (E.g., want to run a wiki from your computer to supplement a course text? Go right ahead, as long as the gradebook files on that same machine are locked down.)

Note that while the terms *white-* and *blacklist* originally came from IT security, here the emphasis is on not security but whether particular goals from the campus IT infrastructure are phrased in positive or negative terms. The decision to follow the blacklist approach advocated here should have no particular consequences for the security and privacy of data on campus servers—which must, of course, still be guarded vigilantly, regardless of the approach taken in designing campus IT policies.

Service Contracts

Another common belief or practice in the IT community itself is a desire to outsource responsibility. This is a common strategy in many businesses and indeed branches of academia, and it is repeated here in the form of a desire to have service contracts covering as much campus hardware and software as possible. For the campus IT staff, this means that when almost anything goes wrong, an easy answer can be given to frustrated users: "We've called it in."

In the early days of the computer age, when universities had just a few fabulously expensive "mainframes," it came as a great surprise that the service contract cost more, over the lifetime of ownership, than the original room full of hardware. After the PC revolution, computers have become commodities whose price has crashed. Similarly, software is a mass production whose marginal cost of additional units is zero, so the commodity price is trivial. In either case, service contracts cost much more than up-front item costs.

This has been turned into something of a virtue today: more and more functions of a campus or corporate IT infrastructure are being "moved to the cloud," where the users do not own anything (hardware or software or, perhaps, even their own data!) but merely pay for a service delivered through a fat network cable to a thin local client.

Careful cost-benefit analyses need to be done here, and it is absolutely not the case that in every situation it makes sense for campus IT to handle everything internally and never to pay for service contracts of any kind. But certainly refusing even to consider covering the risk internally sometimes misses a cheaper and more effective alternative.

4. Open Architectures and Free Software: Open Access for IT Infrastructure

As we have just seen, a blacklist approach to security and network policies is built on a principle fundamentally superior to the whitelist approach, because of its openness to new ideas, the lifeblood of an academic community. The same point can be generalized to the hardware and software products we use on campus: it only makes sense to avoid systems designed to close off unanticipated new uses in favor of the allowed, specific, sanctioned uses by keeping data and hardware structures in closed formats.

I should note that an additional advantage of open formats should appeal even to free marketeers: "closed system" is basically a synonym for "monopoly controlled system," and therefore openness should allow competition, reduce cost, and improve quality.

In short, for these reasons mentioned above, campus IT should always come down heavily in favor of *open architectures*. These are data (and, to a lesser extent, hardware) formats that are public and free of legal encumbrances.

The case for open systems and architectures is very practical, as we have seen, but it is also ideological: universities are in the business of sharing knowledge and culture. We chose to pursue this ideal when we made our lives in academia, and we presumably want to show our students that openness and sharing can be a viable alternative to unfettered self-interest (*pace* invisible hands).

Fortunately, there is an entire movement that has created a truly impressive alternative: free software. Here are some examples of free software that we can use on our campuses:[5]

- the operating system Linux, an alternative to Microsoft's Windows and Apple's OS X
- the web server Apache, which runs a majority of the Internet's websites
- office suites (i.e., word processors, spread sheets, etc.) such as Openoffice or Libreoffice, which interoperate fairly well with Microsoft Office
- the LMS Moodle
- Kuali, a software suite for management of many university administrative functions

The word *free* here does not refer to cost—although free software tends to be far less expensive than commercial software. It refers to a kind of freedom not unlike academic freedom: "Think of `free speech,' not `free beer.'," in the words of one of the early free-software pioneers, Richard Stallman.[6] However, free software does have zero purchase price and no license fees, which can be a strong motivation to go in this direction.[7]

Critics of this approach point out that the total cost of ownership (TCO) must be considered before purely economic reasons can be considered conclusive. In particular, it is often said that an organization needs more highly skilled—and, therefore, more expensive—IT staff if running free software. The service

contracts required to run most commercial software are a way for less qualified local staff to pass problems to the commercial provider. Nevertheless, companies do exist that will provide support services for free software systems. In addition, the long-term economic consequences of more highly skilled IT staff are hard to compute.[8]

In the end, if the financial case for free software's being cheaper than closed, commercial software is unclear, the philosophical and structural case, similar to the one mentioned above for blacklist-based policies' allowing for more innovation, are perhaps the clearest reason to choose this approach.

Note also that I am not suggesting that we impose these free software options on our respective campuses: I am merely saying that free software should be the default on campus, alongside whatever systems, commercial or free, that individual users want and need for their teaching, learning, and scholarship. This can be crystalized in the following proposed *principle of academic network freedom*:

> Academic freedom, that indispensable quality of institutions of higher education, consists of the freedom of faculty and students to teach, study, pursue their scholarship, and disseminate their data without unnecessary legal or institutional restrictions or control. For the IT resources in institutions of higher education, this means that all uses must be permitted, all data and services must be open and must use open protocols and formats unless there are compelling and clearly articulated pedagogical, scholarly, legal, or organizational reasons otherwise.

This principle is clearly modeled on the original definition of academic freedom in the AAUP's *1966 Statement on Government of Colleges and Universities*.[9]

Taken seriously, this principle would imply changes across many aspects of campus life.

- Administrations, particular in public universities, would by default be expected to share all budgeting information.
- Scientists would share all datasets, as early and in as complete a form as feasible.
- Scholarly works would by default be shared (notice that this principle contains within it the implied success of the open access movement).
- Machines in campus computer labs and in faculty and staff offices would by default run mostly free/libre, open-source software, unless there was a compelling reason not to do so.
- Collaborative work in classes and offices would by default be done on open architectures, such as wikis, rather than closed ones, such as shared drives of a commercial operating system.

5. Open Access to Technology as Part of the Wider Open Access Movement

I am using the phrase *open access to technology* (OATT) to play off of the growing movement of open access (OA) to scholarship that has blossomed in recent years.

The history of OA is quirky and unexpected and in fact owes much to OATT, *avant la lettre*, which was on the scene first. In fact, it was the danger that freely shared software with supporting architectures and open standards seemed to face with growing commercialization that inspired Richard Stallman to start the GNU Project and found the Free Software Foundation. Stallman's ideas in turn led to the founding of the Creative Commons, a first effort at opening culture and scholarship in what we now know as OA.

Although OATT largely lost the battle as commercial operating systems and closed software gardens massively dominated a commodity PC market that expanded beyond the wildest dreams of avarice, the Creative Commons quietly grew and, more recently, the OA movement began to take off. I am suggesting in this article that, at least within the safe harbors of university networks, a return to OATT would be of great benefit.

Peter Suber, an articulate spokesperson for OA, defines it as being "digital, online, free of charge, and free of most copyright and licensing restrictions." He goes on to argue why these freedoms are needed: "Removing price barriers means that readers are not limited by their own ability to pay, or by the budgets of the institutions where they may have library privileges. Removing permission barriers means that scholars are free to use or reuse literature for scholarly purposes."[10]

In exactly the same way, free/libre software's lack of up-front license fees lowers the barriers to entry for scholars to combine their ideas and work products with those of other scholars. Likewise, removal of permission barriers allows scholars to try all potentially fruitful digital interactions without worries about and delays for formal permission. Open access to technology is the handmaiden of open access to scholarship, easing obstacles to the creative process of creating new scholarship.

Consider these examples.

- Writing interactive assignments for my students in Blackboard or building new online tests for a publisher-controlled computerized homework system leaves me with carefully designed pedagogical content that is locked away from use and further development by other mathematicians.
- Similarly, a text I might write and distribute to my students in a proprietary format (say one of Microsoft's) could only be used by students who have paid to own that software. Worse, other scholars could not easily adapt the text to make their own customized and improved version unless they also have that commercial software. If, instead, I distribute the text I

wish to share in the original TeX (an early free software system for typesetting mathematics and physics that is now nearly universal in those academic areas), then others can remix and improve my work.

- For my research, I can dip into the sea of shared code and tools and information architectures that are openly exchanged among scholars. As long as I am running open systems on my campus computer, all of this work is available to me to be immediately tested and applied to my own projects. And if I produce results in open formats and release by new algorithms and codes in forms that are open and compatible with free/libre systems, my work can have the impact that I, as a scholar, most seek.

Admittedly, this broad acceptance of OATT strategies for academic networks is very rare. Instead, scholars who want to have the kind of creative freedoms and impact that I described above must generally fight bitter battles nearly every school year to wrestle a little independence for their own machine, lab, or even department. As Suber observes, "If there are complexities, they lie in the transition from where we are now to a world in which OA is the default for new research. This is complicated because the major obstacles are not technical, legal, or economic, but cultural."[11]

Before we leave the comparison of OATT with OA, I should point out one area where openness toward technology has an advantage over open access of scholarship: intellectual property. Every fixed intellectual product must choose an approach to copyright law, and some must also confront patent law. Open access to technology, however, merely dictates that we use open systems, architectures, and formats. As such, there is no implication for legal control of a particular scholarly product. If an academic's product is a program or data or other resource available to the 'net as a whole, then the two principles set forth in this essay would suggest that the product be in an open, interoperable form—but the question of which approach to take toward the intellectual property rights of the author or the author's employer would have to be answered by that institution's open access policy. And conversely, an academic institution that subscribes to OATT would have (mostly) open systems and architectures, which by definition do not have intellectual property encumbrances.

6. Baby Steps and Long-Term Structures

We are currently a long way from the kind of openness I just described. Far from being a default on most campuses (actually, on any campus that I know of in the United States—although it is policy in some other countries and at some US high-tech companies), openness is not only discouraged, but typically anything other than the standard suite of commercial software is forbidden.

Once we faculty members know that there are alternatives to the current closed regime, we can demand change. But until this awareness is widespread, faculty may consider campus IT debates to be as unimportant as faculty involvement in policy regarding campus provision of paper and pencils.

So (self-)education is the first step. There are usually a handful of faculty, staff, and students who have experience with alternative, free software at nearly every institution of higher education, and they can share this with their colleagues. In my experience, these presentations are extremely popular with students, because of the cost (frequently zero!), flexibility, and power of free software.

Next, faculty need to shine a spotlight on the stream of decisions made by campus IT departments. It should be clear that IT policies and practices are deeply involved in "curriculum, subject matter and methods of instruction, research, . . . and those aspects of student life which relate to the educational process," to quote the part of the *AAUP Statement on Government of Colleges and Universities*[12] that outlines areas in which the faculty are agreed to have primary responsibility. Yet rather than having this responsibility, faculty are often completely uninformed of IT policies and planning until after they are adopted.

Sometimes the dissonance is almost humorous, as when a former chief information officer (CIO) on my campus informed a committee of faculty that he had decided to negotiate an extension to our Blackboard contract, entirely without seeking any faculty input on the learning management system we were expected to use in our ongoing contact with students (coincidentally, at around the same time I had heard very positive opinions from the first dozen faculty members I spoke to about trying Moodle). If we have any hope for improvement in IT governance, surely cases like this, when shown clearly to the campus community, will bring impetus for change.

Another issue that warrants debate is control of the campus website. At present, many universities leave this entirely in the hands of the Office of External Affairs (or its equivalent, the campus public relations office) for the stated use as a marketing instrument. Faculty can try to make the case that the website also serves both a pedagogical purpose (getting to students course-related information and, more and more frequently, IT tools used in and around the classroom) and a scholarly one (communicating scholarship and showing, sharing, and collaborating on current projects).

Furthermore, a good argument could be made that as a marketing device, our websites would be far more effective if they had a great deal more content—achievable only by far greater openness—rather than today's obsession with uniform color palettes, approved university logos, and particular font choices. Consider, for example, the most visited site on the World Wide Web: google.com has a rather minimal user interface and leads immediately, when the user finds an interesting search result, to sites with different styles, colors, and fonts. If our campus websites were packed with content, they would be more useful to our students, faculty, and staff, and probably a far more effective marketing tool for our universities. What

prospective student would select my university—which sports good brand identity on every web page but almost no content describing programs, classes, special opportunities, or professors' scholarly work—over another university with a messy site filled with such content but lacking the characteristics of a brand? Experience with google.com seems to make clear that "content is king," and while it is hard to collect this type of data cleanly, some survey results support the priority of specific information about programs and opportunities in the minds of prospective students.[13]

If we can have these discussions and bring the issues into the open, we will have made great progress. To retain any progress we have achieved, we need to set up systems for ongoing faculty involvement in IT decisions—to institutionalize shared governance in this new realm of university life. To that end, I propose a *principle of shared academic network governance*:

> Aspects of a university's IT resources that have substantial impact on the "curriculum, subject matter and methods of instruction, research, faculty status, and those aspects of student life which relate to the educational process" must be the primary responsibility of faculty. While specifics of implementation are appropriately the concern of IT staff and administration, priorities must be set and decisions among viable alternatives always made by faculty.

Note that this is philosophically merely an elaboration and modernization of the part of the AAUP's *1966 Statement on Government of Colleges and Universities* that specifies the appropriate role of faculty in shared governance.

This principle entails a fairly significant restructuring of the organization formalities of campus administrations. In particular, most universities have a chief information officer, a "cabinet-level" administrator usually involved in campus "executive committee" meetings, setting long-term goals and priorities, and who often has other strange powers like signing off on all research grant applications (in theory to approve any consequences the proposed research could have on IT systems).

Several of these roles may be reasonable, but all of them require far greater faculty involvement. It seems to me that an ideal arrangement would be for one or several faculty members to have formal involvement in these activities of the CIO and his or her staff under the following conditions.

- If the faculty member is a single individual (a kind of "dean of IT"), then he or she would need release time and real personal authority to be effective.
- If this faculty role is assumed by a committee (some sort of faculty senate–empowered oversight committee), then it must meet regularly (frequently) and have direct involvement—real oversight!—in IT decisions and operations, and not merely act as a

conduit for the dissemination of new policies and other announcements from the CIO to the faculty body (as is so often the case today).

- At a minimum, the CIO must report to the faculty, at least in spirit, and not be an instrument of the provost, for example.

The dynamic of the relationship between the faculty and the CIO must therefore change from the common current one of faculty watching and reporting out, through one of faculty listening and responding, and end up at one where the faculty are involved, probably day to day, with implementing current policies and setting future priorities. Campus IT departments and CIOs must think of themselves as servants of the community, partnering with (not dictating to) those other servants, the faculty (who serve their students and disciplines), to improve the academic environment. Only in this way can information technology live up to its promise in the academy, rather than being an instrument of bureaucracy and control that drains resources, time, and energy from our pedagogical and scholarly purpose.

A version of this essay was presented at the October 2012 AAUP Shared Governance Conference. I gratefully acknowledge the comments of the anonymous reviewers, which helped improve this essay.

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Notes

[1] . . . . and mass comm faculty working in digital media, engineers doing CAD/CAM, statisticians working with real datasets, historians or political scientists accessing digitized archives on other continents, social scientists working with large government databases, molecular biologists studying protein folding. . . . Indeed, the list goes on suspiciously long.
[2] Please note that I do not by any means intend to say that the two changes just mentioned—online homework in math classes and MOOCs or other online instructional modes—are good things, simply for having a lot of IT in them, that we faculty should embrace. I am in this article neutral regarding these particular cases; I merely want the faculty to be the drivers of scholarly and pedagogical policies and decisions on campus, even those with an IT component. In fact, I think for example that the best thing for math classes would be to pay adjuncts a far better wage so that they teach fewer sections and hand-grade all the homework they assign. But if this is not possible, at least it should be math department faculty who make all the decisions about software and hardware related to the online homework systems they use. Similar concerns apply to MOOCs and other online instruction.
[3] These laws say that the amount of processing power available per constant dollar doubles every eighteen months (Moore), while information storage per dollar doubles every year. They are both somewhat inaccurate and approximate, it must be said, and their demise is (repeatedly) foretold, but they do accurately point to the exponential growth of computer power and storage capacity for constant dollars.
[4] Jonathan A. Poritz, "Information Technology Wants to Be Free," *Academe* 98, no. 5 (2012): 18–23.
[5] More examples can be found in ibid., where I also give more of the history and evolution of free software. I that essay I also mention an additional benefit of free software: its quality, including resistance to malware, is generally far higher than that of commercial software—this should come as no surprise if you believe that the scientific method and peer review produces higher quality scholarship.
[6] Richard M. Stallman, *Free Software, Free Society: Selected Essays of Richard M. Stallman*, edited by Joshua Gay, introduction by Lawrence Lessig (Boston: Free Software Foundation, 2002), 65.

[7] For a case study of four European cities that made a major change to free software for their IT infrastructures, see Mark Cassell, "Why Governments Innovate: Adoption and Implementation of Open Source Software by Four European Cities," *International Public Management Journal* 11, no. 2 (2008): 193–213.
[8] For one case study about a large hospital, see Brian Fitzgerald and Tony Kenny, "Developing an Information Systems Infrastructure with Open Source Software," *Software, IEEE* 21, no. 1 (2004): 50–55. For more general considerations of TCO for free software, see Maha Shaikh and Tony Cornford, "Framing the Conundrum of Total Cost of Ownership of Open Source Software," in *Open Source Systems: Grounding Research* (Heidelberg, Germany: Springer, 2011), 208–19.
[9] AAUP, *1966 Statement on Government of Colleges and Universities,* in *Policy Documents and Reports*, 10th ed. (Washington, DC: AAUP, 2006), 135–40.
[10] Peter Suber, *Open Access*, MIT Press Essential Knowledge series (Cambridge, MA, MIT Press, 2012)**,** 4-5.
[11] Ibid, 8-9.
[12] AAUP, *1966 Statement on Government of Colleges and Universities*, 139.
[13] See "IIT.edu Evaluation Survey: Prospective Undergraduate Students," http://blogs.iit.edu/iit_web/drupal-and-the-news-iit-edu/iit-edu-evaluation-survey-prospective-undergraduate-students/, accessed 4 May 2014; and Megan Mahaney, "The Effectiveness of Social Media Marketing in Higher Education: State University of New York, the College at Brockport," senior honors thesis, College at Brockport, 2012, http://digitalcommons.brockport.edu/cgi/viewcontent.cgi?article=1004&context=honors.