

“Shades of Purple” or “Will Collaboration Around Technology Ever Really Save Money?”

James L. Shulman¹

In every industry in which increases in productivity come more slowly than in the economy as a whole, cost per unit of product must be expected to increase relative to costs in general. Any product of this kind—whether it be a haircut, a custom prepared meal, a performance of a symphony concert, or the education of a graduate student—is bound to become ever more expensive relative to other things.

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*The Economics of the Major Private Universities*²

Genesis of the Mellon Foundation’s ARTstor Project

All who are on the front lines of defending the “price” of higher education are familiar with the “cost disease” paradigm outlined above. Cell phone plans and digital cameras get cheaper every week, and still tuition and fees rise by at least 5

percent throughout decades in which the CPI is stuck at 2. To be sure, there are other “defenses” of the cost of higher education. These include those that accentuate the positive—the “there’s no shortage of good ideas” argument and reminders of the cost of “big science.” There are also begrudging “confessional” explanations of rising costs that meet higher education’s critics halfway: There has undoubtedly been a “proliferation of student services,” though one can point to differing views as to why this is so. It is, however, close to impossible to stand up and defend the price to students and parents of higher education without citing, in some way at some time, a variant of the argument that “we aren’t making widgets here”—the Bowen-Baumol argument that the productivity increases that affect many industries will simply not have the same impact on an enterprise that is centered around the labor-intensive activities of teaching, learning, and research. But, even as we rehearse the basic “facts” of rising costs, we like to believe that we remain ever vigilant lest we provide embarrassing support for those who want to write the next “Profscam” or any article that will inevitably use that peculiar word “skyrocketing” in its title.³

What I want to talk about is the history of one natural experiment—ARTstor—aimed at increasing productivity in a small way but on a sectorwide basis. It is the early chapters of a story about what we’ve learned by building a large-scale digital project that aims both to provide “added value” and to save scarce resources. The lesson is one about institutional sociology, about disintermediation and reintermediation, about trade-

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offs, and about the shifting role of libraries and IT staff. It is also the story of how, I believe, in the long run (and not the Keynesian long run), colleges and universities can save money by sharing resources. But it is a natural experiment, meaning that while it may be messy, at least it is anything but another *posit a vacuum* exercise.

Colleges and universities now spend (on average) 7 percent of their budgets on IT, and roughly a third of this is directed toward academic computing.⁴ Rarely does one hear anymore about how “computers will save us money”; discussions are more frequently about the dangers of not increasing the technology budget to keep up with the latest needs. The notion of productivity increases (either as cost savings or defined as the ability to do more with less) lurk very far in the background of debates over whether the largest increases in the already large IT budget should go toward upgrading ERP (enterprise resource planning) systems or instructional technologies, toward peer-to-peer sharing or security, toward campus portals or distance learning. In a sense, technology seems to be both an unsexy but steady element of the budget (like heat and hot water) and a part of the same arms race that produces lovely daffodils, fitness clubs, and sushi bars on campuses all over the country. Heaven help the school that cedes a place in the race to serve its students well.

Four years ago, when Bill Bowen and I were doing research on the role of athletics in higher education, we questioned the various costs incurred by schools such as Bates, Colby, Vanderbilt, and Rice associated with recruiting and admitting ath-

letes, building facilities, and hiring coaches that enable the schools to compete in up to 40 different varsity sports. One of the things that we realized, the more we added up, cross-tabulated, and ran regressions on data, was the powerful role of mythology that linked college sports to a school's sense of place and identity. We examined, empirically, a lot of myths and found a lot of holes concerning the academic performance of the well-balanced "student-athlete," the idea that most alumni/ae craved more emphasis on sports, and that fund-raising was associated with winning teams. But this type of demystifying still couldn't touch the aura that surrounds "school spirit." It doesn't even make a difference to the "school spirit" myth that Duke "sells" its "home" football game to Florida State in order to make more money for both institutions—the contribution (both real and imagined) of sports programs to institutional community building and differentiation can survive a great deal. The very practical need for schools to differentiate themselves in a crowded higher education market means tapping into deep psychological needs of alumni/ae and students; doing battle in lacrosse, tennis, track, and football seems to be one irresistible means of product differentiation in a market that—to be honest—offers very similar products.

It finally struck us that college sports programs are "local" in a way that reason can never displace. Understanding this "myth of place" demands that everyone forget the fact that many of the kids who applied to Amherst also applied to Williams and but for quirks of their (or the schools') selection processes could have ended up at the other place. One can

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only be amused that even as students, faculty, staff, townspeople, and dispersed alumni/ae of Williams and Amherst race around to watch playoff games played in Wisconsin, sing their school songs, and live and die with whether the Lord Jeffs or the Ephs won the game of the day, they were both wearing slightly different shades of purple! In other words, the students who filled those rosters and the alumni/ae who cheered them on looked nearly interchangeable in terms of their backgrounds, their SATs, their goals, their values, their majors, their career and life choices, the investments that their campus made in various activities, and so on. But when those young men and women don those light purple jerseys to go into battle against those wearing dark purple jerseys, they feel very different from each other and have no doubt as to whether that difference matters.

Fresh from banging my head on the wall of institutional identity politics, I was lucky enough to find a chance to head for uncontroversial territory. Various colleges and universities were approaching the foundation seeking funding to digitize their slide libraries. Mellon, with its history of supporting the humanities and the arts and its recent contributions to digitization (most significantly through the creation of JSTOR⁵), was an obvious place for schools to turn for help in converting thousands or even hundreds of thousands of slides into digital images. Students wanted this to happen so that they did not have to walk across the campus to look at photographs tacked to a wall the night before an exam. But digitizing slide libraries represented a significant financial undertaking, and in a span

of a few months, the foundation had received quite a number of inquiries (each in the area of \$1 million) to allow individual schools to carry out what seemed to us to be, essentially, the same task.

This task would, obviously, have some variations but would undoubtedly consist of hundreds of different schools scanning a slide of, say, the *Mona Lisa* or *Starry Night*. Then, because the image no longer lived in a drawer labeled “Leonardo” or “Van Gogh,” the image would need to be cataloged—a labor-intensive human process for which there is no magical technological substitute. Then, because you wouldn’t want that image (and data) to be frozen into some static course website that couldn’t be changed or repurposed for another course, you would want to build a database. As the poor art history department slid down this slippery slope, they would beg, borrow, or steal time from IT or an unwitting student worker to build “a simple database.” At wealthier places, advertisements went out for the art history department to compete on the open market to hire Oracle database administrators. And meanwhile, the general counsel, who had generally whistled past the graveyard of the intellectual property issues associated with building slide libraries, now was summoned to rule upon what was acceptable behavior. So, it seemed to us that a lot of the work that was going to happen to digitize the slide library in Gainesville, Florida, was a lot like the work that was going to happen in Gambier, Ohio. While there are a million “good” redundancies in higher education—hundreds of different biologists around the country peering at the same cell—digitizing

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the same slide of the *Mona Lisa* didn't strike us as a particularly creative or interpretive act. Anyway, it seemed to us that we were confronting a community-wide issue that wasn't exposed to the “shades of purple” issues that we found in college sports, since all of the schools involved wanted the same basic content and would need the same basic tools.

Somewhere back in Bill Bowen's mind, a parenthetical counter-factual aside from his 1967 article² must have reverberated:

On the other side of the ledger is the possibility of major breakthroughs in the technology of education which would result in sharp gains in productivity. However, in speculating about the significance of these developments for cost per student in the decade ahead, it is well to recognize that many of the most exciting ideas are still untested, and that even if they turn out as well as is hoped, practical implementation on any large scale would require considerable lead time and administrative effort—as well as substantial capital expenditures.

With the Mellon Foundation providing the “substantial capital expenditures,” we set out on what seemed to us to be an unusual opportunity to try to help the sector capture a rare “sharp gain in productivity.”

Without dwelling too long on what we came to call *ARTstor*, I should take a moment to describe what we did to try to be helpful and the big challenges that we encountered.

- We decided to “give the people what they want.” While some museums were working hard to handle the added burden of providing to educational users images of the content that they *had*, we started with a demand side approach of trying to figure out what we had to do to get the users what we knew that they *wanted*. This meant digitizing an entire slide library (since those images were the ones that users had been using for years) and dealing with the plethora of intellectual property issues therein.
- We also decided to work with a broad community of suppliers and users—this meant striving to address the concerns of artists, museums, and image suppliers rather than casually calling everything “fair use” and waiting for the boomerang effect. We felt—and feel—that those who create art or images and those who are entrusted to care for works and sites need to be a part of what we are doing or the project will not have been built on solid ground.
- To manage the risk associated with all of these varying and often conflicting interests, we built software to allow the users to make very active use of the content—but we decided that the images would be distributed wrapped in the software, not as free-floating files. This was a fundamental decision because it was the only way that we saw to deal with the panoply of intellectual property and patrimony issues—both real and potential—that swirl around art images. It was also very significant for

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ARTstor because it committed us to building a software environment rather than just a website.

As we made these decisions, our enthusiasm for the prospects of the project grew. “This,” we thought among ourselves, “is great. Not only will schools not have to digitize their slides and catalog them and build a database and figure out the rights issues and manage the risks these issues pose—they also won’t have to buy or build software for managing and presenting images. And they won’t have to have dedicated staff assigned to build their own course websites. And they won’t have to get into a whole line of work (‘digital asset management’) that is both costly and hard to do well.” Now we weren’t only going to create a community-wide way of sharing the costs of building digital image content, but we were going to provide a way to avoid costly infrastructure and service commitments. This proposition—even better—wasn’t doomed to run into another “shades of purple” maelstrom where the point was local community-building. No gophers, badgers, bulldogs, and tigers here! This was the world of library science and information technology—a world of shared planning that had produced significant money saving efforts, ranging from OCLC (the large cooperative enterprise that provides shared cataloging records for books and journals), to interlibrary loan, shared offsite storage (such as the 225,000-square-foot warehouse shared by Columbia, Princeton, and the New York Public Library, and consortial efforts that had stood up to protest profiteering pricing on the parts of major science journal publishers.

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What We Have Learned

First, I should say that in many ways and at many places, the fundamental idea seems to be working. In two years, more than 600 institutions signed up, including the Michigans and Stanfords of the world but also including more than 130 community colleges. We have agreements in place with major museums around the world to contribute or work with us to create content, and we've got an ever-growing library of wonderful images useful to all sorts of academic fields. For many of the participating institutions, ARTstor has already meant that they could resist "brewing their own." Among liberal arts colleges, members of the Appalachian Colleges Association, community colleges, and even a few major land grant universities that had not already embarked down the path of building their own tools and creating their own digital versions of everything, there has been genuine enthusiasm—both for the collections and for the ability to sit out one costly technology project. It's still early days, but it seems that for some significant number of places, the ARTstor proposition, as originally conceived, makes a lot of sense. They are likely to continue to spend some money and space on a physical slide library since the transition to digital will clearly take some time. But, for today, there is the very real prospect of some new digital costs that can be avoided, and at some point in time, the costs associated with building, maintaining, and storing analog image collections might also be recaptured.

For this audience, however, I want to take a candid look at how the original theory is playing out at some of the schools

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that had already started down the path of solving this problem on their own. We all know that when it comes to a range of issues—from considering the role of race in admissions to faculty tenure criteria, the COFHE colleges⁶ and flagship public universities set a pace and send directional beacons to both the sector and to society at large. For a good number of the leading research universities and selective liberal arts colleges, the “increased productivity” argument that one can find in the ARTstor offering is by no means obvious. At these places, a project like ARTstor runs into a set of institutional buyers (librarians, instructional technologists, and visual resource specialists) who (in the absence of ARTstor, and even with it present) are charged with serving their users as best they can. Use of and adoption of ARTstor also must overcome the fact that many of its potential users’ behavior patterns are deeply ingrained—some refuse to let go of their slide carousels and the personalized service that they have received for 30 years from the slide librarian. Other users (and this would not have been the case five years ago) are reluctant to bear the rather different “switching costs” associated with changing from being on the pioneering edge of the digital horizon to being part of a community-wide exploration. The vanguard of this latter group have forged their own solutions to the use of digital images and may be reluctant to “come in” and play by the rules of someone else’s software or someone else’s intellectual property regime. For these groups, it is more difficult to appreciate the benefits of using someone else’s library (ARTstor’s) and to justify giving up what they had before.

Lessons about Trade-Offs at Places with Resources

The first lesson that we have learned is that the “rational world” where library science and information technology intersect is in fact in the midst of dramatic redefinition. In the “early” days of the Internet, the traditional library’s place in the research and discovery process was unchallenged. As Cliff Lynch⁷ wrote in *Scientific American* in 1997,

[T]he characterization of the Internet . . . as the world’s library for the digital age . . . does not stand up under even casual examination. The Internet . . . was not designed to support the organized publication and retrieval of information, as libraries are. It has evolved into what might be thought of as a chaotic repository for the collective output of the world’s digital “printing presses.” . . . If it is to continue to grow and thrive as a new means of communication, something very much like traditional library services will be needed to organize, access and preserve networked information. Even then, the Net will not resemble a traditional library, because its contents are more widely dispersed than a standard collection. Consequently, the librarian’s classification and selection skills must be complemented by the computer scientist’s ability to automate the task of indexing and storing information. Only a synthesis of the differing perspectives brought by both professions will allow this new medium to remain viable.

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In 1997, the Internet did, indeed, look as if it were going to be a great, big, noisy cacophony. But today’s Internet, dominated by a company whose stated mission is “organizing the world’s information and making it universally accessible and useful,” sounds more than a little like Cliff’s definition of why the 1997 Internet needed librarianship. Google approaches this ambitious mission with enthusiasm, intelligence, the capacity to make significant investments, and a willingness to act decisively. We all know about the Google collaboration with six leading libraries, through which they intend to digitize millions of books. Is this project a good thing? Is it a bad thing?

The project raises many interesting issues, and there have been criticisms of Google’s secretive nature, its particular interpretation of intellectual property rights, and what some regard as its undisciplined and underplanned approach to product development, but one question that seems to me to have been answered definitively is whether only librarians can make the Internet organized and useful. “Real world” companies such as Google are penetrating the “cloistered” world of the library and the campus in fundamental ways.

Let me give just one narrower example about the shipwrecks that occur when efforts of individual libraries or even library software vendors cross into the wake of Google. For the past decade, one of the hottest topics in the library world has been “metasearching”—the process by which electronic resources that a library owns or subscribes to are mapped to one common search engine, allowing users to have “one-stop shop-

ping.” Great idea; very, very slow to materialize. There certainly have been some notable successes in implementing meta-search engines (sometimes on a limited number of the hundreds of databases that they have access to). As they work through these crafted solutions, they look up from their desks to realize that all of their users use Google—*for everything*. The first stop for practically every researcher and every student is Google. One-stop shopping via a library-based metasearch engine that searches a dozen different databases can sometimes feel a bit like a perfect buggy whip in the age of Henry Ford. I confess that this is not entirely fair since metasearch engines do enable their users to drill down into proprietary databases (especially serials) to which Google does not have access. But the power of this generation of Internet search engines seems awesome and not content to be resigned to the status quo.

So what’s a library to do? Hold up its hands and say, “gosh, all we should do is step aside, or perhaps tend to those local collections we hold that are unique”? Libraries have been pulled in two directions by these seismic shifts. Some leaders in the library community believe that their “campus”—and their own brief—has simply grown—to include the world. Providing access to a campus’s resources, be they unique special collections or just very big and rich general ones (as is the case with those institutions that are partners in the Google Library Project) provides an exciting entrepreneurial activity that seems to those involved to also be a public good. Other libraries—most, I think—have begun to ask themselves how they can best turn inward, toward their campus community

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(rather than toward the whole big world), and how they can evolve to serve their networked users better.

Getting to the “there” of changing how the old library serves its networked campus in meaningful ways is not easy, however. Getting out of the reading room may mean learning about application programming interfaces and the comparative merits of Apache Tomcat servers versus Websphere, but it also may mean that the librarian can find or create new ways to serve the users (and their new behaviors). Redefining the library into a digital enterprise can generate entrepreneurial behavior in the same way that partnering with Google does. And here is where I want to raise what is, I think, a key question: when to tailor local solutions and when to buy something “off the rack.”

Some libraries that are trying to redefine their work have launched efforts to build their own digital libraries and services so as to further the admirable goal of integrating library resources into the life of pedagogy. I, for one, certainly agree with this goal and think that it will eventually mean a complete restructuring of the library, information technology, and instructional technology enterprises. But in these early days of figuring out what to do and what not to do, a lot of costly activities are happening, most dramatically at the places that can afford them. The Digital Library Federation (a consortium of the 34 largest and most sophisticated university and research libraries) was launched in 1995 as an effort to build a collective networked library. But this year, it needed to launch a new project (called Aquifer) to “reawaken” its original 1995 goal of creating a distributed open digital library.⁸ Why was this

“reawakening” necessary? Because the Federation’s entrepreneurial members have been spending the past few years working on their own projects—building their own software, integrating their various systems, and creating (or gathering) content to be locally housed.

There is, I recognize, a strong argument to be made in favor of the library throwing itself into digital repository building and other localized services. Cliff Lynch articulates very well the view that these repositories—essentially large software programs and databases for holding any sort of digital object—are essential and will serve as “a recognition that the intellectual life and scholarship of our universities will increasingly be represented, documented, and shared in digital form, and that a primary responsibility of our universities is to exercise stewardship over these riches: both to make them available and to preserve them. An institutional repository is the means by which our universities will address this responsibility both to the members of their communities and to the public.” But these repositories are not a casual undertaking, as he notes: “In establishing institutional repositories, institutions are both accepting risks and making promises; they are creating new expectations. In a budget crunch, the institutional repository may be one of the last things that can be cut, given the way that digital preservations demand steady and consistent attention and hence funding.”⁹ The importance of going in with one’s eyes open is central to any digital enterprise, and I propose that there might be places where certain undertakings might be avoided. Libraries will, I believe, differentiate be-

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tween management of archived assets and the service environments that reach out of the library and into the classroom or the course website. Creating or implementing the former may (or may not) necessitate the creation of the latter.

JSTOR, which provides an archive of the full back run of well more than 600 scholarly journals, has been an opportunity to depend on an external agency to take care of the whole undertaking. Institutions took to JSTOR very quickly when it was launched in 1997 because its appeal was obvious and few if any places were toying with the idea of digitizing their own miles of journal collections. There had been no competing efforts to “do it yourself” such as we encounter in the realm of creating archives of images. And so, JSTOR was able to create an overwhelmingly strong case for sharing, and to do so very quickly.

We at ARTstor believe, of course, that we can serve a campus’s users very well, even though we are not where they are. We have tools that allow users to add their own images to our 400,000 image library. We have teams of people who are identifying valuable and unusual collections, creating or enhancing the all-important cataloging of data, and scanning content at very high levels of quality. But we also know that in order for an end user or an institution to “buy in” to ARTstor, they have to be willing to live with trade-offs. The type, nature, significance, and costs of these trade-offs are key variables in the disintermediation equation.

The concept of “disintermediation” is exemplified most notably by the Amazon.com model: The original notion was that

cutting out one, two, or even 10 middlemen would reduce costs for both the suppliers and buyers. It is one of the two or three fundamental business models that has been celebrated and castigated in the rise and fall of Internet commerce. For Amazon, it has mostly worked—people have been happy to buy books or CDs or even lawn furniture from Amazon. Do we miss our local bookstore? A little bit. But Amazon strives to soften the trade-offs involved—the site offers us free shipping sometimes or supports algorithms that stand in for the local bookseller who would say, “If you liked that, you might like this.” Amazon works for us. Sometimes mediation (including personal service, time to delivery, and the like) is something that we are willing to sacrifice when the cost savings or increased convenience holds sufficient appeal. But other times, we’d rather stick with the old-fashioned local service route. Think, for example of Drugstore.com; there are many reasons why it has floundered, but perhaps the most obvious is that people are willing to desert their bookseller but not the personal and immediate service that they get from their pharmacist.¹⁰

When a slide room or a local digital library effort waits on a faculty member’s every need, change will be hard. Moreover, if the cost savings accrue to the provost’s office rather than to the buyer or the end user, other incentives to change have to be even more tempting than they are in the Amazon model if they are to be compelling. Book buyers who don’t have to pay for the books are not likely to be persuaded by Amazon’s discounts, and it is hard to imagine the local bookshop being the

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one to convince its buyers that there is a whole new way of having their books go straight to their home.

The path for ARTstor, going forward, is very clear:

1. We will continue to provide ways for institutions and end users to mix their local content with the ARTstor content—these include a hosting service and what we think of as personal collections (whereby the end user can add his or her own images, either online or offline). This will serve our users as well as our library intermediaries who will—and should—continue to digitize those segments of their collections that are unique.
2. We will continue to expand the tools by which we enable other software environments to mingle with our own, via searching and exporting (into ARTstor and, to the degree that our intellectual property constraints permit, out of ARTstor as well). This interoperating will also allow local intermediaries to combine the scale of ARTstor with their own local technological context. This openness is how the Internet has grown. Even fierce competitors such as Microsoft and Sun are learning to work together out of necessity.
3. We will continue to add to the amount and type of content that will be available in ARTstor, thereby winning over more campus constituencies. This has been a key component of Amazon’s growth.¹¹ Scale matters for ARTstor, and if a campus feels that we

address only a small part of their needs, their loyalty to what we do will be correspondingly limited.

4. We will continue to develop, within our budgetary constraints, content, data, and tools that will serve our educational users well so that they find very good options when they seek to mix their wardrobe and determine when they might be inclined to choose some clothes off the rack and when they still need to go to their local tailor. As a user-driven library, we treat the University of Miami's users and Sewanee's users as *our* users—in the same way that those libraries do. Sometimes their users will turn to their local library and sometimes to us. And as this all evolves, we will—through the goals and values that we share with the local campus libraries—find new ways to work together to serve the users even better.

In short, we believe that in the short term and at some groups of colleges and universities, we will need to earn our place as a *quality enhancement* rather than as a means of *increasing productivity*. This is the case because without the short term, the long term will not exist, and we have come to realize that what we are proposing will, for some places, be a long-term proposition. My economics textbook reminds us that the short run is that period of time in which only some inputs, the variable inputs, can be adjusted. In the short run, fixed factors, such as the plant and equipment, cannot be fully modified or adjusted. But over the long run, anything can change.¹²

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In observing the natural—and long-term—experiment of ARTstor, it is important to remember that even though ARTstor could make the case for its place as an instructional technology infrastructure, the service is being sold to libraries (in conjunction with the end users they serve). In other words, collection acquisition officers in libraries—not provosts’ offices and not IT staff—are making the decision to license ARTstor, and this is why ARTstor needs to make its “brief” as a valuable library resource for scholarship rather than as an instructional technology. Nevertheless, some places are using the arrival of ARTstor on campus as a locus for experimenting on how the library, instructional technology, visual resource libraries, and information technology might redefine their relationship. And, as I noted earlier, natural experiments are notoriously messy and defined by context. At some institutions, the library and instructional technology groups work together seamlessly; at others, they are at each other’s throat. At various places (with these various relationships in place), ARTstor may be provoking some institutions to define or redefine these boundaries. This is the natural experiment of introducing a service that bridges “content,” “software,” and “services” and forces institutions to answer the question of who is going to “own” the project as it “lands” without prescribed labels on a campus. It is not a theoretical question for us or for the user. And these campuses that are wrestling with the un-neatly bounded product that we are offering will be the ones that, over time, will either say “yes, this thing can replace some activities that we would have to undertake ourselves” or else they won’t.

Whatever we might, from afar, believe is possible, an institution (especially the relatively wealthier ones) is not going to make decisions to save money on the mere “speculation” that ARTstor is going to serve as an easy substitute for the institution’s own efforts. When I spoke with the deputy provost at a leading research university about how ARTstor might or might not ever provide a place like that with a means to increase productivity, he told me “What you have to do is to serve our faculty really well.” When I noted that this seemed to consign ARTstor to the “luxury item” heap—the fancy and costly new product that you might love if you can afford it rather than the “save money” category—he corrected me. “I’m not saying that you should only try to be a ‘do more with more’ kind of enterprise. I’m saying that you have to serve our faculty really well, because if you don’t do that, nothing else you do will matter. If you *do* accomplish that, then it’s up to us to figure out what else we *don’t* have to be doing.” Getting to the long term will require some parallel spending.

General Lessons?

I realize that readers of this paper are not just interested in our Quixotic effort to build an enormous and growing shared “special collection” of images to be used in the arts and all around the campus. Some of you may be interested in the changing role of the library and of academic computing. But I imagine the most important laboratory dish, in which ARTstor is but one experiment among many, can be represented by the follow-

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ing question: When and how can institutions share technological resources without having to build—or customize to the point of building?

Let me start this section by noting that sometimes, sharing works really well. One lesson from the Five Colleges consortium that binds together Smith, Mount Holyoke, Amherst, the University of Massachusetts, and Hampshire is that sharing everything from a high-speed Internet loop to some faculty appointments in less commonly taught languages can actually work. It takes a lot of meetings, but it seems like it can actually save resources. Another set of lessons comes from infrastructure projects such as Internet 2, where a consortium of schools can build a massive project that will connect and serve them all. There are also various open-source projects (from both within and outside the higher education community) that allow campuses a “head start” in implementing and modifying systems they would otherwise have been tempted to buy or to build from scratch.

But when it comes to projects such as the implementation of enormous ERP systems that most campuses have undertaken in recent years, the costs and the frustration levels have been enormous.¹³ Why is it that there has not been a PeopleSoft or an Oracle solution that allows nonprofit institutions to buy paper towels, send a tuition invoice, designate students as *magna cum laude*, or carry out in a standard and acceptable way any of the other functions that we are all doing? Why does it require endless customization?

Maybe the nature of the barriers that prevent technology

from increasing productivity in higher education is well understood by others. I cannot claim to have many answers. But the early days of the ARTstor experiment are raising the following hypotheses concerning the general topic, which can be tested, both by the ARTstor experience as the years go by and by other similar efforts.

Remember, first, that the desire to innovate on one's own and the resistance to buying "off the rack" is much more prevalent at the wealthier institutions. As Bruce Johnstone¹⁴ has written,

Many (by no means all) presidents, provosts and deans are sensitive to, and solicitous of, their faculty in ways that have no counterpart in business or even most other public agencies. This "sensitivity"—correlated with a genuinely influential role of the faculty—is not typical of all colleges and universities. Rather, there is a continuum of "authority sharing," ranging from an authoritarian end, where faculty senates are non-existent or at least non-functional (although there are frequently strong faculty unions) and where the president controls all decision and directs all organizational (including faculty) behavior, to a "collegial" or even "deferential" end, where faculty have very great influence, and even authority, over not only the curriculum and matters of faculty membership (i.e., appointments and promotions), but even over the definition and direction of faculty work itself What may appear to a trustee or a politician or a businessman or businesswoman to be *administrative timidity* is more a purposeful choice of that governing style most as-

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sociated with the most prestigious and generally most “successful” college and universities. It is clearly not a governing style conducive to abruptly changing institutional mission or to forcing a change in the productive behavior of faculty.

I would venture to say that this inclusive and respectful style of governance extends not only to faculty but to staff. It is a fact of life at places with resources, and the question is not, “Can we be more top down?” but “What do we need to do to make sensible transitions given this environment?”

- The existence of legacy data and behavior increase the difficulty of switching anything. Whether the topic at hand is historical accounting data or a given professor’s old spreadsheet containing cataloging that describes a Chinese cave painting’s various buddhas, migrating old data and the user behavior associated with it represents a sizable barrier to change. Sometimes it is easier to start from scratch and to have had nothing before, though this is often not possible.
- Projects that touch mission-central things are extraordinarily sensitive. There are always going to be activities on every campus that are more or less central and hence can be considered more or less optimal for experimentation. But supporting the public performance of a professor standing up in front of a class of students must be done very well. It is entirely reasonable that proposed changes in the systems that support the most

central of these activities must be able to clear a very high bar.

- An external purchased “product” had better be good at dealing with both of the previous issues, or it is likely to be rejected.
- Implementing something that will be cost efficient over the long run in such an environment might well require *highly inefficient* parallel commitments to bridge from the short term to the long term.
- “The slow one now will later be fast.” Previously underserved constituencies embrace change faster. ARTstor is adored by historians, classicists, language teachers, sociologists, geographers, engineers, and others who may have wanted to use images before but never had any support in doing so. They have not had a tailor; they are very happy to have clothes.
- Institutional boundaries have to evolve. In the specific case of ARTstor’s rollout, the departments involved include the library, the slide library, and instructional technology. The role of these areas will inevitably change over time, and these changes can be greeted strategically or passively. And the community that has to work through these large-scale shifts cannot depend on people to act against their vested interests, obviously. Self-interest need not be selfish (in the negative sense) since the tailor who makes a suit undoubtedly does serve his user well. But determining the right balance of

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change and continuity seems to require some degree of “stepping back.” I would posit that this is true for other areas where there is a possibility of transinstitutional collaboration.

- Trade-offs are trade-offs. If the trade-off is not worth it, people will not make the trade (at least not of their own free will). Minimizing the trade-offs involved with any transition—establishing valuable “pluses” and progressively eliminating the “minuses” associated with a change—can be a step-by-step process, but it has to happen.

Running the risk of an absurd analogy concerning what can be learned from building a digital library of art images, I am reminded of the enormous public relations effort known as the Federalist Papers. As we remember, the issues of “states rights” in 1787 were very different than they are today. There was a great deal of resistance to the proposed Constitution because it banned, among other things, the right of individual states to print their own currency or have their own standing militia. Madison, Jay, and Hamilton wrote the papers to convince people that working together federally was worth the trade-offs. Writing in Federalist 37 about the “history of factions, contentions, and disappointments” that made up history’s great efforts to work together in council,¹⁵ they applauded the fact that the convention had accepted their—our—Constitution (*italics added*):

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In revolving the causes from which these exceptions result, and applying them to the particular instances before us, we are necessarily led to two important conclusions. The first is, that the convention must have enjoyed, in a very singular degree, an exemption from the pestilential influence of party animosities the disease most incident to deliberative bodies, and most apt to contaminate their proceedings. The second conclusion is that all the deputations composing the convention were satisfactorily accommodated by the final act, *or were induced to accede to it by a deep conviction of the necessity of sacrificing private opinions and partial interests to the public good, and by a despair of seeing this necessity diminished by delays or by new experiments.*

Today, it makes all the sense in the world to us that Kansas should not have a different currency than Colorado. But it is a matter of great passion whether the University of Kansas's digital asset management system might be shared or locally owned, designed, and managed. Who knows? Maybe 200 years from now, we will all be celebrating the trade-offs that were made in the early 2000s to all work together better across higher education. To be sure, there are elements of the ARTstor story that are very particular to our quirky effort, for example, the intellectual property sensitivities specifically associated with art images. But I think that there will be—in time—lessons that may apply more broadly. I still believe—whether ARTstor can do it or not—in the goal of putting aside our respective “shades of purple” and doing some things to-

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gether that will be bigger, better, more effective, and more efficient than what we can each do by ourselves.

NOTES

1. Writing is a team sport. I'm grateful to those who vetted, edited, and made important contributions to this paper, including Bill Bowen, Charlie Clotfelter, Ira Fuchs, Kevin Guthrie, Max Marmor, and Jo Ellen Parker.

2. William G. Bowen, *The Economics of the Major Private Universities*, pp. 16 and 29. Berkeley: Carnegie Commission on the Future of Higher Education, 1968.

3. See, for example, “The Skyrocketing Cost of Higher Education,” issued by the House Committee on Education and the Workforce, John Boehner, chairman, October 10, 2003; http://www.house.gov/ed_workforce/issues/108th/education/highereducation/factsheetcost101003.htm.

4. Kenneth C. Green, *Campus Computing 2004: The 15th National Survey of Computing and Information Technology in American Higher Education*. Encino, CA: Campus Computing Project, 2004.

5. Journal Storage: The Scholarly Journal Archive, <http://www.jstor.org>.

6. The Colleges of Further and Higher Education Group of the Chartered Institute of Library and Information Professionals (CILIP).

7. Clifford A. Lynch, “Searching the Internet,” *Scientific American* 276 (March 1997), 52-56.

8. Katherine Kott, "DLF Aquifer Business Plan," Digital Library Federation, May 25, 2005; <http://www.diglib.org/aquifer/AquiferBusinessPlan.pdf>.

9. Clifford A. Lynch, "Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age," ARL Bimonthly Report 226 (February 2003), 1-7.

10. Another example where one would think that getting easy access to a commodity would require no intermediation is Mortgage.com, but it too struggles, perhaps because even if personal service is irrelevant, privacy and trust issues might matter a great deal.

11. Instead of doing everything themselves, they partner with us—note how they describe their partnership with Toys "R" Us: "Toysrus.com and Amazon.com have teamed up to provide you with the ultimate online toy-shopping experience. Toysrus.com's vast selection of the hottest toys, great deals, and exclusive offers, combined with Amazon.com's premium online store means you'll get the best of all worlds."

12. Paul Samuelson and William Nordhaus, *Economics*, 16th ed., p. 107. Boston: McGraw-Hill, 1998.

13. While this audience may be all too familiar with ERP systems, some may not know a great deal about this major category of institutional expenditures: Enterprise resources planning software and systems (such as Oracle and Peoplesoft) are defined by Wikipedia as systems that "typically handle the manufacturing, logistics, distribution, inventory, shipping, invoicing, and accounting for a company. Enterprise Resource Planning or ERP software can aid in the control of many business activities, such as sales, delivery, billing, production, inventory management, and human resources management" (http://en.wikipedia.org/wiki/Enterprise_resource_planning). In higher education, these systems often also are expanded by adding

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modules that manage student records and enrollment. Implementing them is very costly (sometimes hundreds of millions of dollars) and often requires extensive customization. See Florence Olson, “Big Systems: Living with Fewer Customizations,” *The Chronicle of Higher Education* (January 30, 2004). Ira Fuchs has also reminded me that the Kuali project represents just the sort of collaborative and open project described above (see <http://kuali.org/>).

14. D. Bruce Johnstone, “Higher Education and Those ‘Out of Control Costs.’” In P. G. Altbach, P. J. Gumport, and D. B. Johnstone, eds., *In Defense of American Higher Education*, pp. 144-178. Baltimore, MD: Johns Hopkins University Press.

15. James Madison, “Concerning the Difficulties of the Convention in Devising a Proper Form of Government,” *Federalist Paper No. 37*, *Daily Advertiser* (January 11, 1788); http://thomas.loc.gov/home/histdox/fed_37.html.

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