A new model for computing services across Penn

Abstract. Computing now touches everyone at Penn. Those who use and those who provide computing services recognize that Penn's structures for support can be improved. The model presented here was developed by a campus-wide task force in the fall of 1995 and vetted across the University. Pilot projects are underway to test and refine the model.

The model clarifies a division of labor at Penn. Primary computing services will be provided close to the user by schools and units, while core infrastructure and second-tier support will be delivered by the central computing group, confederations, or outside vendors. Two strategies help shape secondary services: networking as a regulated public utility and service bureaus where markets exist. The model also offers a potentially powerful way for Penn to take action at the University level; a few cross-cutting processes will be funded directly and managed across traditional organizational boundaries.

Contents
Introduction page 2
What problem are we trying to solve? page 2
Principles page 2
The model page 3
The future from here page 5

Appendix I: Task Force page 7
Appendix II: Implementation Steering Group page 8
Appendix III: Leaders of pilot teams page 9
Appendix IV: Primary services page 10
Appendix V: Secondary services page 12
Appendix VI: Cross-cutting processes page 14
Appendix VII: Developing funding structures page 14

For more information. The project's World Wide Web site can be found at http://www.upenn.edu/restruct. Or contact Linda May for more information (may@sc.upenn.edu; 215-898-0005).
A new model for computing services across Penn

DRAFT FOR COMMENT

Computing now touches everyone at Penn. It has become a vital element in a world fueled by information. In the fall of 1995, Penn's Provost and Executive Vice President appointed a University-wide task force to make computing services easier and more cost-effective for those who use them. Our charge was to design a new structure for organizing, staffing, and funding computing services across Penn. The task force (Appendix I) has produced a model that will guide organizational change over the next few years. Pilot projects are underway to test and refine the model, but principles and basic components can be described in some detail.

The model doesn't claim to do everything. It doesn't ignore history. It is a way of doing business that gives members of the community the chance to make Penn better and exposes each of us to the costs of bad decisions and the benefits of good ones.

What problem are we trying to solve?

Those who use and those who provide computing services recognize that Penn's structures for support can be improved. Some things are needlessly complicated. People don't always know where to go for help. It's hard to tell what things cost. Changing things won't be easy—demand is soaring, technology changes relentlessly, and Penn is a very complex place. But we have accepted the challenge to make computing work better at Penn.

Each of Penn's twelve schools supports the technology needs of its faculty and students in different ways—and the principle of Responsibility Center Management requires us to expect the schools to pay their own way. Some, but not all, of Penn's administrative divisions have their own computing staffs. The central computing group, Information Systems and Computing, provides services that range from essential infrastructure best managed University-wide (the network, for example, or payroll) to frontline user support. Central/peripheral tensions are played out at several levels: from center/school to school/academic department. The Library is caught in the middle of technology decisions made by ISC and the schools. And everywhere people need more and better support. In short, we have Responsibility Center Management in principle, but a messy situation in practice.

Principles

For computing to be applied strategically at Penn, it must be easier and more cost-effective for the people who use it. To this end, the task force took Responsibility Center Management as a framework and tried to unite responsibility and authority where they have grown apart. At the same time, we tried to focus Penn's actions at the University level. And we tried to create incentives to integrate computing decisions into the core decisions of the University.

The new model is based on the following principles:

1. Put the client first. Locate support and support decisions close to the recipient.
2. Integrate computing decisions into the strategic decisions of the University.
3. Give units more control over costs. Offer services on a market basis where possible.
4. Focus Penn's energies by organizing and funding a few important activities along process lines.
5. Move toward confederated activities that overcome the traditional Penn dichotomy of "school vs. central."
6. Abolish unfunded mandates.
8. Make plans and policies that encourage flexibility. Expose organizations, processes, and services to sunset laws that require them to prove their value in changing circumstances.
The model

Basic elements of the new model are described here. More detail is found in four appendices. The project’s World Wide Web site can be seen at http://www.upenn.edu/restruct.

The user. The computer user is at the center of our model. Each person ideally has a local computing “home” and takes all computing questions there. Beyond this circle of primary support are expanding circles of secondary services—provided by ISC, by confederations, or by outside vendors. But the map of services is irrelevant to the recipient: the primary support person navigates that landscape.

Primary services. In the model, schools and administrative divisions are responsible for their own primary computing support. This includes frontline customer support (including the desktop computer and its relationship to the network) and support of local academic and administrative systems, services (including local-area networking), and innovations. Units can provide primary support themselves or buy it from other schools, from ISC, or from outside Penn. The task force urges that guidelines for basic primary support levels be set and that Penn institutionalize ways to keep these levels moving up.

The model makes primary support local so that decisions are based on the real cost of service. Primary support providers can do a good job of telling users what things cost and helping them make responsible choices. The model seeks to end current incentives that lead people to demand unlimited services. (Allocated-cost service is “free”—because already paid for—the reasoning goes, so why not ask for more?) The model also seeks to end unfunded mandates at every level. Schools may reasonably fear that burdens will shift to them as ISC stops offering
primary support as an allocated-cost service to the general community. This reflects, however, the extent to which ISC has been the recipient of unfunded mandates in the past, a practice the task force recommends ending as efficiently as possible.

While frontline support for faculty, students, and staff is the responsibility of Penn’s schools and business units, their ways of delivering and funding that support will vary widely. For many faculty, for example, the department is the natural computing “home”—yet economies of scale are needed. The task force recommends that schools explore departmental coalitions and other affinity groupings based on location, discipline, or type of computing. For undergraduates, the task force recommends moving over time to residence-based support, building on broader efforts to restructure student services across Penn. Good models for residential support exist at Stanford and Northwestern. How fast Penn could move in this direction—and how to support undergraduates in the meantime—are under discussion.

**Secondary services.** Secondary services undergird primary support and make the whole greater than the sum of the parts. The task force calls for a more focused set of such services: core administrative systems, networking, data administration and information security, second-tier support for computing organizations around campus, standards and architecture, site licensing, and communication at the enterprise level. Penn’s central computing group, ISC, will concentrate on these services. A few may be candidates for delivery by confederations, individual schools, or outside vendors. ISC will review each of the services it now provides, eliminating some and focusing more heavily on others. While most of these secondary services will continue to be funded by allocated costs, Penn will move over time, as indicated below, to market-based structures where they make sense.

A vital central function that aids confederation and contains costs is the negotiation of standards across Penn. The task force stresses that standards succeed at Penn only when they are worked out by the community itself. The many and sometimes hidden costs of compliance with standards otherwise become another kind of unfunded mandate. Incentives to adopt standards will be built into the support structure.

Two new strategies help shape secondary services:

- **Network as a regulated utility.** Penn’s network will be run as a regulated public utility—with service-level agreements, campus-wide standards, and a “Public Utility Commission,” or governing board, drawn from Penn’s schools and units. The principle here as elsewhere is to let the common business of the institution be managed in common as far as possible. As a utility, the network will be funded by a mix of allocated and direct charges, with specific funding strategies to be taken up by the PUC. Telephone and video services will be incorporated into this utility structure.

- **Market-based service bureaus.** Small businesses, or “service bureaus,” will be set up where markets exist. The intent is to establish, over time, enough of a marketplace to help control costs and encourage a focus on the customer. Service bureaus can already be found at Penn. Wharton Reprographics is well known; ISC sells support-on-site, training, application development, and facilities management of computer systems and will scale up these businesses and launch others if markets prove to exist. Any unit is invited to set up a service bureau in Penn’s evolving economy.

**Process teams to focus University action.** The model offers a potentially powerful way for Penn to take action at the University level. A few cross-cutting processes will be funded directly and managed across traditional organizational boundaries. For the moment, Penn will concentrate on two or three high priority processes such as academic innovation and student services. These processes can be considered “institutional bets” with high potential payback. As political implications of the process perspective are worked out, more of Penn’s daily life may be organized and funded along process lines.

The task force can’t guarantee that process teams will transform the institution, but we can say that the innovations they achieve will not distort the system, create unfunded mandates, or break the bank. Processes will be funded partly at the University level and partly as units bring people,
dollars, or facilities to the table. The high visibility of process teams can also draw outside funds. Process teams will buy services from existing organizations, strengthening the evolving market economy of the new model.

Process teams are confederacies. The task force on restructuring computing has already been this kind of confederated team, drawn from across the University to do the University's business together. To work well, such groups need to bring the real interests of Penn's units to a common project. They will be created not by any special mechanism, but by the responsible decision makers of the institution.

**Governance.** Computing has become essential to almost all fields of research and instruction and to Penn's administrative life—and Penn is investing heavily. The task force calls urgently on the leaders of Penn's schools and units to integrate computing decisions into the regular decisions of the University. Computing is no longer just a technical specialty, but a strategic advantage. We also urge the Provost and Executive Vice President to explore the feasibility and desirability of convening a chartered group to consider issues of campus-wide importance to Penn.

**Costs.** Cost-effectiveness, targeted investment, and giving units more control over their costs are aims of the model. In an area where Penn's investment is sure to expand, our sponsors want to see money saved in some areas and reinvested in others. For example, as ISC reduces the number of things it does for allocated costs and cuts costs in other ways, funds can be returned to the Provost's budget. The task force strongly urges that these savings be spent on forward-looking computing activities. Process teams are a prime target for these funds.

We freely and frankly say that we cannot tell whether this model will be seen by individual units as costing them more or less. Rather, in an environment of exploding demand, the model will give units more control over their costs. The model tries to unite responsibility and authority where they have grown apart, to reveal real costs where they have become obscured, and to return choice to purchasers where it has been eroded.

All in all, the model clarifies the division of labor under Responsibility Center Management. Schools (and business units) are responsible for their own primary computing support. They can provide it themselves or buy it from others. The center concentrates on secondary services. Standards help tie the structure together. The model encourages confederation for the common good even as it values organizational self-reliance; process teams, for example, focus action at the University level. The model calls on Penn's leaders to integrate computing decisions into other core decisions of the University. And it aims to give units more control over their costs.

More details of the model can be found in four appendices:
- Appendix IV: Primary services
- Appendix V: Secondary services
- Appendix VI: Cross-cutting processes
- Appendix VII: Developing funding structures

**The future from here**

The task force has completed the design phase of its work. The Provost and Executive Vice President have appointed a much smaller Implementation Steering Group (Appendix II) to stimulate and oversee pilot testing and transition to the new model and to further develop funding structures. The sponsors and steering group continue to consult with leaders of Penn's units and negotiate ways of applying the new model. For example, the question of primary support for all will need careful examination in virtually every unit. ISC is prepared for a transition of eighteen months (from January 1996) to withdraw from providing primary support as an allocated-cost service to the general community (though contract or other arrangements can be negotiated with ISC).

Some of the analytical work of the original task force continues, notably in two teams (Appendix II) working on funding (how to pay for what we do, now and in the future) and benchmarking (what are best practices elsewhere for questions that arise here).
The following pilots are underway to test the new model:

1. New kinds of "learning spaces" (process team): Begin creating at Penn a range of technology-based "learning spaces" such as classroom/lab hybrids. Build on the success of the Provost's Classroom Committee; seek outside funds.

2. Support-in-residence for students (process team; primary support): Pilot the viability of moving to residence-based primary computing support for undergraduates; lay groundwork for transition. Begin with one or two residential units and closely coordinate with broader efforts to restructure student services across the University.

3. Networking as a utility (service-level agreements; public utility commission): Begin establishing Penn's network as a regulated utility—with service-level agreements, campus-wide standards, and a "public utility commission," or governing board, drawn from Penn's schools and units. Develop funding strategies for the network.

4. Link help desks across campus (process team; primary support): Link help desks across campus by sharing software that tracks problems and solutions. Set common standards and practices for using the software. SAS and ISC will initially deploy the software; SEAS, the Library, and MED will help shape the implementation.

5. Primary support-for-hire (service bureau; primary support): Test and adapt for broader implementation ISC's distributed staffing program, in which local units contract with ISC to locate computing support staff on-site. Explore market needs for other potential frontline services such as custom help desks or dispatch services.

6. Second-tier support (secondary services): Begin establishing a coherent and effective system of second-tier support for computing organizations around campus—including escalation of technical questions, “matchmaking” and resource sharing, and train-the-trainer activities. Determine organizational structures to deliver those services. Define performance measures, service-level agreements, and formal ways to get customer feedback.

7. Facilities management-for-hire (service bureau): Improve, expand, and formalize ISC's program of facilities management, in which ISC provides technical and operational support for computer systems that belong to clients. Treat the recent contract with the School of Dental Medicine as a pilot to learn more about running this service as a business.

The Steering Group will guide and integrate these pilots. It will draw lessons from the pilots and revise and renegotiate the model in light of lessons learned. With the Penn community, it will design responsible funding structures and lay groundwork for transition to the new model.

ISC and other Penn computing organizations are restructuring in line with the new model. ISC, for example, is rethinking roles and responsibilities, sharpening its focus on enterprise services, and restructing to provide other services on a direct-charge basis or as regulated utilities. Other units at Penn—the School of Arts and Sciences is a notable example—are likewise rethinking the services they provide and the ways they provide them.
Appendix I: Task Force to Restructure Computing Services across Penn

In the fall of 1995, Penn's Provost and Executive Vice President appointed a University-wide task force to make computing easier and more cost-effective for those who use it. Our charge was to design a new structure for organizing, staffing, and funding computing services across Penn.

Sponsors:  
Stanley Chodorow, Provost  
John Fry, Executive Vice President

Chairs:  
Peter C. Patton  
ISC  
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Project manager: Linda May  
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Carl Abramson  
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Mark Liberman  
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Mark Aseltine  
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Donna Milici  
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Robin Beck  
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Steve Murray  
EVP
Eric Clemons  
WH  
Gerry McCartney  
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Wilson Dillaway  
Lib  
Katie McGee  
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Mike Eleey  
ISC  
Bob Pallone  
DEV
Al Filreis  
SAS  
Warren Seider  
SEAS
Jim Galbally  
DEN  
Susan Shaman  
Prov
Ben Goldstein  
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Al Shar  
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Janet Gordon  
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John Smolen  
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Lyle Ungar  
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George McKenna  
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Mike Guilfoyle  
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Joe Harris  
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Mike Palladino  
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Nancy Rauch  
ISC
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Prov
Debbie Sokalczuk  
SAS
John Yates  
SAS

Center for Applied Research
Lynn Oppenheim
Mario Moussa
Appendix II: Implementation Steering Group

In the spring of 1996, the Provost and Executive Vice President named an Implementation Steering Group to guide pilot testing of Penn’s new model for organizing, staffing and funding computing services across the University.

Sponsors: Stanley Chodorow, Provost
          John Fry, Executive Vice President

Chair: James O’Donnell ISC/SAS

Project manager: Linda May ISC

Members
Robin Beck ISC
Wilson Dillaway Lib
Mike Eleey ISC
Al Filreis SAS
Bonnie Gibson ISC
Mark Liberman SAS
Linda May ISC
Gerry McCartney WH
Ira Schwartz SW
Susan Shaman Prov
Al Shar MED
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Jim Galbally DENT
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Benchmarking Workgroup
Donna Milici ISC (captain)
Mike Palladino ISC
John Yates ISC
Pat Adams ISC
Nancy Rauch ISC

Center for Applied Research
Lynn Oppenheim
Mario Moussa
Appendix III: Leaders of pilot teams

Seven pilots are testing Penn's new model for organizing, staffing, and funding computing services across the University. Team leaders are noted below.

1. New kinds of "learning spaces" (process team)
   - James O'Donnell ISC/SAS
   - John Smolen VPUL
   - Donna Milici ISC

2. Support-in-residence for students (process team; primary support)
   - Al Filreis SAS
   - Larry Moneta VPUL

3. Networking as a utility (service-level agreements; public utility commission)
   - Ira Winston SAS/SEAS
   - Gerry McCartney WH

4. Link help desks across campus (process team; primary support)
   - Katie McGee SAS
   - Mike Kearney ISC

5. Primary support-for-hire (service bureau; primary support)
   - Don Montabana ISC
   - Mike Provost VET

6. Second-tier support (secondary services)
   - Mark Aseltine GSFA
   - Mike Kearney ISC

7. Facilities management-for-hire (service bureau)
   - Jim Galbally DENT
   - Carl Abramson ISC
Appendix IV: Primary services

In the new model, schools and administrative divisions are responsible for their own primary computing support—affirming the principle of Responsibility Center Management. They can provide it themselves or buy it from other schools, from ISC, or from outside Penn. In general, primary support will encompass frontline customer support (including the desktop computer and its relationship to the network) as well as local academic and administrative systems, services (including local area networking), and innovations. The task force urges that guidelines for basic primary support levels be set and that Penn institutionalize ways to keep these levels moving up.

Frontline support will be backed up by secondary services provided by the center, by other units, or by outside vendors. For the computer user, the primary support provider is the link to those services.

In practice, the distinction of primary and secondary support is not a dichotomy, but a continuum of services appropriately sited. For example, an individual laboratory might support its own local area network (LAN), the academic department that sponsors the laboratory might handle LAN upgrades, a set of departments might share a LAN expert, and the central computing group might make available a network engineer. In our model, the primary support person—not the user—navigates these complexities.

Principles. Because primary support is key to our model, we have described the ideal, our target, in some detail below.

Primary support is accessible.

The computer user knows the primary support provider and has easy access. Primary providers are physically located with their clients if possible. If clients are remote or scattered, the primary provider is accessible by email, telephone, or pager.

Primary support owns its problems.

Primary providers "own" the problems encountered by their users (for supported products and within the support limits set by the unit). A working principle is that a provider never says, "I can't help you, " but says, for example, "I don't know the answer to your problem, but I'll find it, or find someone who can."

Problems are documented and structured.

The primary provider works with users to structure their problems. This helps the provider understand the problem, and allows problems referred elsewhere to move more effectively through the support system.

Primary providers have content knowledge.

Primary providers know the operating systems of their users' desktop computers and how to link the desktop systems to the network. They know mainstream productivity software, as well as the specialized software commonly used by their clients. (Special arrangements might be needed to support clients who are more technically sophisticated than their primary provider.)

The client base is well defined.

Primary providers are not only empowered, but required, to tell those who fall outside their client base to go elsewhere for support. To the extent possible, providers know where to direct those people.

Campus units that choose not to provide primary support to their members should expect to pay a premium for their members' access to second- and third-tier support elsewhere in
the institution. This is fair because the unsupported user is likely to bring small problems to expensive places and may not have exhausted cheaper remedies.

Problem escalation and referrals are handled smoothly.

Clients have paths to management when their problems are not well handled. Clients are, directed, however, back to the primary provider if they attempt to work around their immediate support structure and access second- or third-tier support without prior arrangement.

Mechanisms are in place to refer problems that a primary provider alone cannot solve. Sources of second- and third-tier support are clear, and means of access are well defined.

Primary providers share information with each other.

Primary providers know the activities and problems of their clients—and often learn of things outside their own domain. Both kinds of information are systematically shared across the broader support system.

**Special cases.** A few special cases are noted; much more analysis is required.

On-site support for remote users: Remote users who require on-site support that cannot be delivered by the primary provider should be referred elsewhere within Penn or to preferred commercial vendors. Mechanisms are needed to evaluate and monitor those arrangements and negotiate the best prices. Penn’s remote users range from faculty and staff on leave to students who study at a distance to those who sometimes travel or work from home.

Business consulting: Primary support providers are expected to integrate needs, resources, technology, data, etc. into a coherent support environment. Some problems, however, will require analysis that primary providers may lack the time or experience to perform. The task force suggests that a market may exist at Penn for a service bureau that helps people analyze business problems and assess possible solutions.

Informal support: Staff serving other functions can be very effective at delivering primary computing support if secondary support is in line to back them up. Staff already in place can do triage and "first aid" if they know how and when to pass people to the next level. This "Hey, Joe!" support is common at Penn and needs to be acknowledged in job descriptions.
Appendix V: Secondary services

The model recognizes that some types of computing services make the whole greater than the sum of its parts. The task force calls for a more focused set of such services, outlined below. ISC will concentrate on these secondary services. A few are good candidates for delivery by confederations, individual schools, or outside vendors. ISC will review the services it now provides, eliminating some and devoting more energy to others. With the community, ISC will perform periodic “sunset” reviews of services, processes, and organizations.

Networking
- Infrastructure
- Services

Core administrative systems
- Application development
- Technical and operational support

Data administration and information security
- University data model, data dictionary
- Negotiation of data issues that require consensus
- Information security

Standards and architecture
- Enterprise technology planning; standards and architecture
- Tracking of emerging technologies

Second-tier support for computing organizations around campus
- Escalation of technical problems and questions
- “Matchmaking” and brokering (interest groups, resource sharing, etc.)
- Shared information tools for solving support problems
- Other support-the-supporter activities (training, etc.)

Site licensing
- Site licenses and volume discounts for software and hardware

Communication at the enterprise level
- Outreach and advocacy
- News and information dissemination
- Point of contact for vendors, external organizations, and fundraising

While most of these services will continue to be funded by allocated costs, Penn will move over time to market-based structures where they make sense. ISC will give the Penn community a periodic accounting of what it receives for allocated costs.

Two new strategies for delivering secondary services are described below.

Network as a regulated utility. Penn’s network will be run as a utility—with service-level agreements, campus-wide standards, and a “public utility commission” (PUC), or governing board, to keep it responsive and competitive. The PUC will approve tariffs, service levels, and standards; seek the input of the community; and participate with others in strategic planning for the network. The PUC governing board will be drawn from the units of the University and will include network-intensive researchers. As a utility, the network will be funded by a mixture of allocated and direct charges, with specific funding strategies to be taken up by the PUC.

Task force discussions have focused on PennNet and the Penn Video Network, both operated by ISC, with a view to making these services more like Telecommunications’ telephone service, which operates like a traditional utility (but without a PUC). Potential extensions of the model include a common PUC for all three services and a common management structure for all three.
Typical attributes of a utility include:

- Reliability
- Ubiquity
- Standards and codes for interconnection and use
- Economies of scale
- Regulated monopoly status
- Oversight by PUC on rates, service levels, and planning
- Service-level agreements (at least with major customers)
- Efforts to engage customers in planning and needs assessment
- Efforts to help users be "smart" consumers of services
- Standard ways for customers to add or change service and to report trouble
- Fees often related to service levels or use.

Currently, the Penn Video Network approaches the utility model, while PennNet and its related services are more mixed. In general, the PennNet core (backbone routers, inter-building fiber, etc.) come closest to a traditional utility. Central PennNet services (authentication, directory, News, Web, list servers, etc.) operate somewhat like a utility. And satellite closets, station wiring, LAN servers and services, and email are subject to varying practices and interpretations. The Network Policy Committee has functioned, to some degree, as a PUC (with annual review of proposed rates, participation in network architecture planning, etc.) but has not had the governing authority that a PUC would have.

**Market-based service bureaus.** The model moves Penn toward a market economy in some areas, to control costs and encourage a customer focus. Where it makes sense, "service bureaus," or small businesses, will sell products or services or hire out individual professionals to local projects or longer term assignments. Wharton Reprographics and ISC's support-on-site program are examples of service bureaus that already exist at Penn. Any unit is invited to set up a service bureau. In practice, most will likely be run by the center.

Service-level agreements will define offerings, scope, cost, and performance measures. Primary providers will act as intermediaries or partners in such arrangements. With a healthy set of service bureaus in place, local units might see their own staffing needs shrink.

In their pure form, service bureaus compete in the open market. Strategic concerns might warrant an allocated component for some service bureaus. Start up might be funded by University seed money or loans, prepayment by key clients, or pooling of funds. Transition strategies (for ISC units in transformation) might involve a tapering off of allocated funds—or perhaps a giveback of allocated funds with a promise to spend them with the service bureau for a period of time. The task force recognizes the difficulty of moving to a market economy. It knows that transition will take time and that not every new business will succeed.
Appendix VI: Cross-cutting processes

The model seeks ways to focus strategic actions at the University level. One potentially powerful strategy is the direct funding of broad processes that cross traditional organizational boundaries. These processes will be funded partly at the University level and partly as participants bring people, dollars, or facilities to the table. For the moment, Penn will concentrate on a few high-priority processes such as academic innovation or student services. Over time, more of Penn’s daily life may be organized and funded along process lines.

Computing is just one element of these processes. The academic innovation process, for example, draws together schools, the Library, the Division of University Life, the Classroom Committee, and the lab managers' interest group, among many others. In practice, major processes encompass smaller ones. Academic innovation encompasses smaller processes such as classroom renovation and the introduction of software such as Maple into the curriculum.

Process teams are confederacies that link authority, responsibility, and funding. Leadership comes from wherever appropriate. Processes have "owners" who make sure that the work of the process doesn't fall through the cracks between traditional organizational units.

Process teams have a life cycle. The initial political work is done by the process team; members need authority to commit resources and make decisions. As political issues are settled and the process becomes more routine, activities can be handed off in different ways. Labs, for example, might start out within a process team and be handed off to a lab managers special interest group. Some process teams may evolve into new types of formal organizations.

An opportunity to be explored is how the process perspective (and underlying machinery) can improve center/local interfaces—and more importantly, how the new perspective can influence the core activities of both central and local organizations.

Appendix VII: Developing funding structures

Cost-effectiveness, targeted investment, and giving units more control are aims of the model. With responsibility for primary support squarely at the local level, units have more control over what they spend—and greater control brings pressing decisions about the funding and staffing of services offered their members.

A funding framework for the new model is being designed by the Implementation Steering Group, the pilot teams, and a subgroup of financial specialists. The framework includes principles, operating guidelines, and specific mechanisms and structures. We are assembling a framework pilot by pilot in order to construct a campus-wide strategy—if that proves to be appropriate—from the ground up. Eyes on the horizon, we are concerned with "piloting the funding," not just with funding the pilots.

As part of this effort, and in keeping with the model's emphasis on local control, we are documenting basic building blocks of costs and funding—for example, support ratios, salaries for different kinds of computing staff, and costs of equipping a staff member. Penn's units can combine these building blocks in ways that make sense for the unit. Or the unit might look for ways to trade off one type of cost against another: substituting capital for labor, for example, or transforming existing staff positions into computing positions.

The funding framework, like the entire model, rests on two basic assumptions about computing. First, computing isn't something that happens "somewhere else." It is inseparable from Penn's mission and touches every member of the University community. Second, funding for computing is everyone's business. The computing infrastructure is now part of the campus infrastructure and should be factored into fundraising strategies and budgetary planning.

Principles. All of this activity is guided by three funding principles, implied by the model's organizational elements:
Choice and responsibility are linked.

Schools and units should be able to make choices about how to meet their own computing needs. With this choice comes responsibility for the consequences on finances, customer satisfaction, productivity, and learning—and for the effect on others in the Penn community.

Reserve central funds for enterprise-wide and strategic services.

Use central funds for services that support the University as a whole or that further Penn’s strategic agenda.

Fund processes.

Fund a few important processes directly. This is one way to make strategic “institutional bets.” Process teams represent Penn confederacy at its best, drawing funds from schools and units, the central computing group, University seed money, and external partnerships.

Operating guidelines. Guidelines such as the following inform the evolving funding framework:

Encourage standards.

Standards are encouraged not to limit choice but to hold down the cost of computing. Recognize that unique solutions are sometimes the most effective, but take into account the full cost of non-standard technology.

Take life-cycle costs into account.

Plan for the entire life cycle of an investment in information technology.

Recognize economies of scale.

When economies of scale are substantial, schools and units gain by confederating or by counting on the center.

Guiding questions. Questions such as the ones below are helping us develop specific funding models and mechanisms. In practice, for example, funding mechanisms act as incentives for behavior. Supporting a service wholly with allocated costs, for instance, may encourage customers to think of it as “free,” and stimulate demand, while supporting it wholly with direct charges may limit use. Penn will want some services to be perceived as free, or nearly so, and others as carrying a cost.

• What behaviors does the funding model encourage? Discourage?
• Does the funding model put services and dollars where they’re needed?
• How does the funding model hold down costs?
• Does the funding model still work if not everyone plays?
• Does the funding model still work if service complexity or volume increases substantially?
• How does the funding model help create services that adjust to what people need?