“The difference between being effective and being just efficient, is the ability to access, refine, utilize and disseminate the collective experiences of everyone in the company.”

- John Seely Brown
Xerox's Palo Alto Research Center
I. Executive Summary

In the spring of 1996, the Task Force to Restructure Computing Services at Penn initiated a number of pilot programs to investigate and illuminate the consequences of the Committee's restructuring recommendations. One of these pilots, titled 'Linking Help Desks Across Campus' was a joint SAS-ISC effort to implement a shared problem resolution and tracking system for their respective help desks based on Apriori from Platinum Technology.

The business plan presented here, for a service now christened PennTIPS (Penn Technical Information for Providers of Service), is firmly based on the pilot's progress to date. The Apriori system has been fully operational since September 1996. It is used routinely by both ISC and SAS help desks for logging incidents and resolving problems. Client data for over 45,000 University faculty, staff, and students is updated regularly and available to ISC and SAS providers at the time of contact. However, the work of the pilot phase is nearly complete. This plan brings it to a close by recommending the framework for an operational phase with ongoing management and operations, leading to broader deployment.

The plan envisions PennTIPS as a University-wide collaboration of computing support providers sharing a single repository of technical, tracking, and client information in an effort to leverage technical support to the University of Pennsylvania community. PennTIPS provides:

- technical questions and answers provided by support professionals throughout the community,
- tracking and queuing of client incidents,
- a database of client information obtained from University data systems,
- reporting and escalation features for management and resource planning.

The plan recommends a cooperative organizational model. Members and organizations provide resources in a combination of cash and in-kind contributions. A cooperative model is suitable here because members possess relevant expertise and work together for mutual benefit.

The plan identifies three distinct organizational roles: members, technical teams, and a management committee. Members are computing support providers who use the service and contribute to its storehouse of technical support knowledge. Technical teams have responsibility for operating the service and are organized functionally. The plan recommends three teams to start, focusing on systems management, member services, and content. The plan allows for the number and nature of these teams to change over time as the service matures and requirements change.

The plan is being submitted by the pilot team to the IT Steering Committee for discussion and approval at its June 23, 1997 meeting. Comments can be sent to any of the team members or to apteam@sas.upenn.edu. A complete listing of participating team members and other contributors is given in Appendix C.
II. Business Description

Business Name

PennTIPS - Technical Information for Providers of Service

Concept

PennTIPS is a University-wide collaboration of computing support providers sharing a single repository of technical, tracking, and client information in an effort to leverage technical support to the University of Pennsylvania community. PennTIPS provides:

- technical questions and answers provided by support professionals throughout the community,
- tracking and queuing of client incidents,
- a database of client information obtained from University data systems,
- reporting and escalation features for management and resource planning.

Mission:

To deliver timely computing support information to the University of Pennsylvania community through a collaboration of support professionals sharing technical, tracking, and client data.

III. History

PennTIPS is an outgrowth of the Task Force to Restructure Computing Services at Penn and the Linking Help Desks Across Campus pilot project. PennTIPS embodies the following restructuring principles:

- local support units providing primary support,
- secondary services complementing front-line support and making the whole greater than the sum of the parts,
- computing services delivered more easily and cost effectively,
- process teams managed across traditional organizational boundaries.

Apriori is the technology behind the PennTIPS service. In the summer of 1994, a team formed to investigate problem tracking resolution systems for use by the Information Systems and Computing help desk. At that time the team recognized that the selected system would need to be scalable as other schools and departments might also be interested in a problem tracking and resolution system. Apriori from Platinum Technology, a market leading problem resolution system, was selected in the spring of 1995. Apriori is also used as a problem tracking solution at other higher education institutions including Carnegie Mellon, Indiana, Duke, and Princeton Universities.

In February 1996, the Task Force to Restructure Computing Services initiated the Linking Help Desks Across Campus pilot project. The team's goal was to develop a core system for sharing problem management and solution information among several service provider organizations. This team, a partnership of Information Systems and Computing (ISC) and the School of Arts and Sciences (SAS), devised a plan to implement the Apriori product within the ISC and SAS help desks. The team successfully put Apriori into production use in the fall of 1996.
This plan constitutes the final deliverable of the pilot team. It is intended to serve as a framework for broadening the scope of the service to become a widely-used tool for University computing support providers.

IV. Problem Definition

The Task Force to Restructure Computing Services recommends that local support units be the standard approach for providing primary computing support across campus, and that multiple secondary units provide services to supplement primary support. According to the restructuring project’s benchmarking studies of industry information (e.g., Gartner) and best practice (e.g., Rice University), institutions which similarly decentralize primary support achieve optimum results when a common problem tracking and resolution environment is shared across the distributed support centers.

PennTIPS addresses three major challenges that face support providers in the current and restructured University of Pennsylvania computing environment:

1. To provide quality customer service:
   • Problems are recorded in the shared knowledgebase which is then searched for quick access to potential solutions,
   • Issues can be efficiently routed and tracked within a work group through the call tracking system,
   • Local management is notified when problems are not closed in a timely manner,
   • Local support providers will be able to handle their own problem research.

2. To reduce the duplication of effort in problem solving:
   • A shared knowledgebase is accessible to all members,
   • Members contribute information to the knowledgebase,
   • Through call tracking, a member can determine problem and client history.

3. To improve communications among computing support groups:
   • A common problem tracking system and knowledgebase provides a means for sharing support information,
   • The PennTIPS teams provide additional cross-unit collaboration,
   • The shared infrastructure provides a common framework for providing support and reporting.

V. Marketing Plan

The marketing strategy for PennTIPS is to introduce this service systematically to the University community. During the pilot phase, the ISC First Call and the SAS Customer Services and Planning units served as the base groups responsible for creating and rolling out the service. This core group provided various product demonstrations to the University community throughout the pilot phase.

PennTIPS has successfully completed the pilot phase and will begin roll-out to the University community as soon as the organizational infrastructure is approved and staffed. Each new group will be asked to contribute to the various teams and provide the necessary resources to support the use of the product within their organizations.

The following groups have already expressed strong interest in participating in the service and would be among the first to be added in the initial stages of the production phase:
• Support in Residence - Ware College House (Pilot program)
• School of Engineering
• Office of Student Information Systems (VPUL)
• ISC Support on Site (selected sites)
• ISC Networking
• ISC Data Administration

In order to incorporate these new groups within the next year, the PennTIPS service will provide train-the-trainer sessions and will establish a mailing list to enhance support and encourage a strong group affiliation. When all of these groups are added to the system, there will be approximately 150 support providers. Other groups interested in joining PennTIPS will be incorporated as resources permit.

VI. System Management Environment

PennTIPS system management separates naturally into two components: application administration and system administration. Application administration deals with tasks such as configuration of the Apriori server, development of the database and its indices, registration of host users, and monitoring of Apriori usage. System administration involves responsibilities such as installing and upgrading the underlying operating system software, coordinating hardware maintenance and upgrades, monitoring system performance, establishing and implementing system and database backup/restore policies and installing auxiliary software necessary for optimum functioning of the PennTIPS service.

The PennTIPS service is one of two major applications running on an ISC-supplied IBM RISC/6000 590 running AIX 3.2.5 that is housed in the ISC machine room at 3401 Walnut Street. This machine has 256M of memory; 4.4G of disk space is devoted to the Apriori application. The operating goal for this platform is twenty-four hours a day, seven days a week availability with down time for requisite maintenance and upgrades scheduled to minimize disruption of service to customers whenever possible. The PennTIPS service itself is available during all times of system accessibility except during brief periods when the Apriori database is locked to perform backups and database reorganizations.

Both production and test Apriori servers are installed on the 590. The production server, with over sixty host users and 50,000 client records, currently runs Apriori Version 2.1; the test server runs Apriori 2.2 with a subset of the production system's host users and a test database copied from a snapshot of the production server taken in February 1997. The primary function of the test server is to try out new application releases and to test modifications to data import procedures, database structures, work queues, and custom programming prior to implementing them in production.

VII. Organizational Plan

The organizational framework for PennTIPS arises naturally from the structures the pilot team developed in completing its work. Each of the major organizational divisions and functions have direct antecedents in the pilot. Indeed, one major accomplishment of the pilot is the discovery and elaboration of these structures - structures which are workable and reflect the underlying principles of the new Model for Computing Services across Penn.

Consequently, the roles played by the Task Force to Restructure Computing Services and the Linking Help Desks across Campus pilot team are formalized below. The oversight role continues in a now-permanent IT Steering Committee. Responsibility for management and policy recommendations resides with the PennTIPS management committee made up of a mixture of managers from major stakeholders, technical team leaders, and elected PennTIPS members.
The technical teams reflect the set of 'virtual teams' which evolve to meet the various operational, data, and service needs of the implementation. Finally, the membership, and its responsibilities, follow from the collaborative nature of the pilot, with members making important in-kind contributions of time and expertise.

Tables 1 and 2 summarize the major roles and responsibilities envisioned for each of the four major organizational groups: IT Steering, Management Committee, Technical Teams, and Members (both voting and non-voting). A fuller description of roles and other pertinent details are given in appendices A and B.
### TABLE 1: Organizational Structure

<table>
<thead>
<tr>
<th>GROUP</th>
<th>ROLES &amp; RESPONSIBILITIES</th>
<th>PARTICIPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Steering Committee</td>
<td>• approves PennTIPS policy,</td>
<td>Senior faculty and IT administrators from schools and centers selected by Provost and EVP</td>
</tr>
<tr>
<td></td>
<td>• sets general direction of PennTIPS service,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• appoints a liaison to the PennTIPS management committee,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ratifies rate structure</td>
<td></td>
</tr>
<tr>
<td>Management Committee</td>
<td>• establishes rules for membership,</td>
<td>Representatives of the top three contributing schools or centers, technical team leaders, and additional at-large elected members</td>
</tr>
<tr>
<td></td>
<td>• determines rates and in-kind contributions,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• sets and monitors service goals,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• revises and recommends changes to the PennTIPS organizational and operational structure,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• coordinates efforts of the technical teams,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• sets customer service goals</td>
<td></td>
</tr>
<tr>
<td>Technical Teams</td>
<td>(see TABLE 2)</td>
<td>Members providing in-kind contributions</td>
</tr>
<tr>
<td>Systems Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voting Members</td>
<td>• elects representatives to the Management Committee,</td>
<td>Full-time PENNcard holders with an Apriori account</td>
</tr>
<tr>
<td></td>
<td>• provides in-kind contributions,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• regularly uses the Apriori system</td>
<td></td>
</tr>
<tr>
<td>Non-Voting Members</td>
<td>• provides in-kind contributions,</td>
<td>Other individuals with Apriori accounts including, but not limited to: co-ops, sponsored guests, work study students, and part time staff</td>
</tr>
<tr>
<td></td>
<td>• uses Apriori system</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 2: Technical Teams Organizational Structure

<table>
<thead>
<tr>
<th>GROUP</th>
<th>ROLES &amp; RESPONSIBILITIES</th>
<th>SKILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems Management</td>
<td>• Unix system administration and facilities management,</td>
<td>• professional Unix system administration</td>
</tr>
<tr>
<td></td>
<td>• Apriori applications management,</td>
<td>• Apriori administration</td>
</tr>
<tr>
<td></td>
<td>• account initiation,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• client software distribution,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• vendor liaison</td>
<td></td>
</tr>
<tr>
<td>Member Services</td>
<td>• promotion of PennTIPS program,</td>
<td>• marketing</td>
</tr>
<tr>
<td></td>
<td>• member liaison,</td>
<td>• Apriori database administration</td>
</tr>
<tr>
<td></td>
<td>• implementation consulting,</td>
<td>• teaching</td>
</tr>
<tr>
<td></td>
<td>• training and mentoring for members</td>
<td></td>
</tr>
<tr>
<td>Content Management</td>
<td>• establishing and managing document creation process,</td>
<td>• technical writing</td>
</tr>
<tr>
<td></td>
<td>• editing documents for content and style</td>
<td></td>
</tr>
</tbody>
</table>

VIII. Financial Plan

The PennTIPS financial plan is detailed in the next few pages. The approach we have taken is to estimate the cash outlays required for items such as hardware and software purchase, depreciation, and maintenance. We have also included estimates of the FTE cash equivalent of in-kind contributions necessary to run the service. We have done this for four representative membership levels: 1 (minimum), 50 (about where we are now), 200 (where we would expect to be about a year from now), and 500 (estimated maximum number of support providers at Penn).
## Cost factors

<table>
<thead>
<tr>
<th></th>
<th>1 Member (Base Cost)</th>
<th>50 Members</th>
<th>200 Members</th>
<th>500 Members</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware/Software</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware Requirement</td>
<td>1/3 RS-6000 590 equivalent</td>
<td>1/2 RS-6000 590 equivalent</td>
<td>2 RS-6000 590 equivalent</td>
<td>4 RS-6000 590 equivalent</td>
</tr>
<tr>
<td>License and Maintenance</td>
<td>existing license, annual maintenance</td>
<td>unlimited license, annual maintenance</td>
<td>unlimited license, annual maintenance</td>
<td>unlimited license, annual maintenance</td>
</tr>
<tr>
<td>FM Charge: floor space, utilities, etc.</td>
<td>1/3 RS-6000 590 equivalent</td>
<td>1/2 RS-6000 590 equivalent</td>
<td>2 RS-6000 590 equivalent</td>
<td>4 RS-6000 590 equivalent</td>
</tr>
<tr>
<td><strong>Systems Administration FTE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Administration, Operations, Applications Monitoring</td>
<td>0.3</td>
<td>0.35</td>
<td>0.5</td>
<td>0.75</td>
</tr>
<tr>
<td><strong>Applications Management FTE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vendor Communications, Upgrades/Batch Releases, Writing Triggers</td>
<td>0.2</td>
<td>0.35</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td><strong>Content Management FTE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client Data, Document Editing and Maintenance</td>
<td>0.25</td>
<td>1</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Member Services FTE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Management, Resource Accounting, Training/Mentoring, Planning</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Marketing FTE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promotion, SLAs</td>
<td>0</td>
<td>0.5</td>
<td>1</td>
<td>0.75</td>
</tr>
<tr>
<td>Management Team FTE</td>
<td>0.15</td>
<td>0.25</td>
<td>0.35</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>TOTAL FTE</strong></td>
<td>1.9</td>
<td>3.95</td>
<td>5.85</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td>1 Member (Base Cost)</td>
<td>50 Members</td>
<td>200 Members</td>
<td>500 Members</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------</td>
<td>------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Projected Cost</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hardware/Software</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware Requirement</td>
<td>$ 4,950</td>
<td>$ 7,500</td>
<td>$ 15,000</td>
<td>$ 30,000</td>
</tr>
<tr>
<td>Software License Cost</td>
<td>$ 10,000</td>
<td>$ 14,000</td>
<td>$ 14,000</td>
<td>$ 14,000</td>
</tr>
<tr>
<td>Software Annual Maintenance</td>
<td>$ 7,500</td>
<td>$ 9,500</td>
<td>$ 9,500</td>
<td>$ 9,500</td>
</tr>
<tr>
<td>Hardware Maintenance</td>
<td>$ 2,640</td>
<td>$ 4,000</td>
<td>$ 9,000</td>
<td>$ 11,000</td>
</tr>
<tr>
<td>FM Charge: floor space, utilities, etc.</td>
<td>$ 1,452</td>
<td>$ 2,200</td>
<td>$ 6,000</td>
<td>$ 9,000</td>
</tr>
<tr>
<td><strong>Facilities Management FTE</strong></td>
<td>$ 19,755</td>
<td>$ 23,048</td>
<td>$ 32,925</td>
<td>$ 49,388</td>
</tr>
<tr>
<td><strong>Applications Management FTE</strong></td>
<td>$ 13,170</td>
<td>$ 23,048</td>
<td>$ 32,925</td>
<td>$ 65,850</td>
</tr>
<tr>
<td><strong>Content Management FTE</strong></td>
<td>$ 16,463</td>
<td>$ 65,850</td>
<td>$ 98,775</td>
<td>$ 164,625</td>
</tr>
<tr>
<td><strong>Member Services FTE</strong></td>
<td>$ 65,850</td>
<td>$ 98,775</td>
<td>$ 131,700</td>
<td>$ 164,625</td>
</tr>
<tr>
<td><strong>Marketing FTE</strong></td>
<td>$ -</td>
<td>$ 32,925</td>
<td>$ 65,850</td>
<td>$ 49,388</td>
</tr>
<tr>
<td><strong>Management Team FTE</strong></td>
<td>$ 9,878</td>
<td>$ 16,463</td>
<td>$ 23,048</td>
<td>$ 26,340</td>
</tr>
<tr>
<td>Minimum Cash Projected Cost</td>
<td>$ 25,090</td>
<td>$ 35,000</td>
<td>$ 47,500</td>
<td>$ 64,500</td>
</tr>
<tr>
<td>Maximum In-Kind Cost</td>
<td>$ 126,567</td>
<td>$ 262,308</td>
<td>$ 391,223</td>
<td>$ 529,215</td>
</tr>
<tr>
<td>Total Projected Cost</td>
<td>$ 151,657</td>
<td>$ 297,308</td>
<td>$ 438,723</td>
<td>$ 593,715</td>
</tr>
<tr>
<td>Minimum Cash Per Member</td>
<td>$ 25,090</td>
<td>$ 700</td>
<td>$ 238</td>
<td>$ 129</td>
</tr>
<tr>
<td>Maximum In Kind Per Member</td>
<td>$ 126,567</td>
<td>$ 5,246</td>
<td>$ 1,956</td>
<td>$ 1,058</td>
</tr>
<tr>
<td>Full Cost Per Member</td>
<td>$ 151,657</td>
<td>$ 5,946</td>
<td>$ 2,194</td>
<td>$ 1,187</td>
</tr>
<tr>
<td>Maximum In Kind Per Support Provider (FTE)</td>
<td>1.92</td>
<td>0.08</td>
<td>0.03</td>
<td>0.02</td>
</tr>
</tbody>
</table>
## Pricing Assumptions

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apriori License: 20 Users</td>
<td>$ 50,000</td>
</tr>
<tr>
<td>Maintenance, 20 Users</td>
<td>$ 7,500</td>
</tr>
<tr>
<td>Apriori Unlimited Upgrade</td>
<td>$ 20,000</td>
</tr>
<tr>
<td>Depreciation Period for Software (yr)</td>
<td>5</td>
</tr>
<tr>
<td>Maintenance, Unlimited Users</td>
<td>$ 9,500</td>
</tr>
<tr>
<td>Annual Depreciation of 20 User License</td>
<td>$ 10,000</td>
</tr>
<tr>
<td>Annual Depreciation of Unlimited License</td>
<td>$ 14,000</td>
</tr>
<tr>
<td>1 FTE including EB</td>
<td>$ 65,850</td>
</tr>
<tr>
<td>FM for RS6000 (estimate) or Replacement</td>
<td>$ 4,400</td>
</tr>
<tr>
<td>Annual Depreciation of RS6000</td>
<td>$ 15,000</td>
</tr>
<tr>
<td>RS/6000 Hardware Maintenance</td>
<td>$ 8,000</td>
</tr>
<tr>
<td>Hardware Equivalent for Depreciation/Maintenance</td>
<td>0.33</td>
</tr>
</tbody>
</table>
Appendix A: Organizational Structure Details

The PennTIPS organizational structure is composed of the IT Steering Committee, the PennTIPS management committee, the PennTIPS technical teams, and the PennTIPS members. The function of each of these groups follows.

IT Steering Committee
- approves PennTIPS policy
- sets the general direction of the PennTIPS program
- appoints a liaison to the PennTIPS management committee
- approves 'rate' structure
- approves proposals from the management committee

Management Committee
- recommends policy
- determines the rules of membership
- establishes rates for Membership fees
- determines in-kind contributions of staff resources
- sets operations principles such as acceptable use and server resource allocation
- manages budget
- revises and recommends changes to the organizational structure, including technical team structure
- reports semi-annually to the steering committee
- conducts planning for PennTIPS organization and functions
- defines service levels
- oversees quality assurance
- sets and monitor goals
- reports effort, cost, and service effectiveness
- assists with marketing efforts

Rules for membership on the management committee:
- committee members must be voting members--no more than nine members on the management committee
- one seat from each of the top three contributing schools or centers from previous fiscal year
- up to two at-large members from organizations other than the three top contributors, elected by the full voting membership in June of each year
- technical team leaders with no fixed term

Technical Teams
- Teams are organized functionally and may change over time.
- Team leaders are elected by their teams and serve on the management committee with approval of their local management.
- Management committee maximum size may limit the number of teams.
The teams consist of Systems Management, Member Services, and Content Management.

**Systems Management**
- Unix server system administrator
- Unix server facilities management (operations)
- Apriori application administration
- Client data feeds
- Account initiation (Unix and Apriori)
- Client software distribution infrastructure
- Software upgrades, client and server

**Member Services**
- Training and mentoring for providers
- Documentation for provider use
- Web site management (service information)
- Account management (open, update, close)
- Usage tracking
- Member recruiting
- Implementation consulting

**Content Management**
- Establish and manage document creation process by members
- Edit for content and style
- Manage document index
- Manage symptom list

**Members**

**Criteria for Individual Membership:**
- all members must have Apriori accounts
- accounts can be pro-rated
- membership cannot be shared
- accounts cannot be shared

**Membership is divided into two classes:**

**Voting Members**
- must be a full-time, PENNcard holder with Apriori Account
- Every member of the Management Committee must have Voting Membership Status

**Non-Voting Member**
- other individuals with Apriori accounts, including, but not necessarily limited to:
  - co-ops
  - full-time temporary staff
  - sponsored guest account
  - students
  - part-time staff

**Roles & Responsibilities**
- Provide in-kind contributions for service teams or management
Appendix B: Technical Team Details

Systems Management

Systems Administration
- install Apriori and any upgrades/fixes to the Apriori software
- develop and implement a backup/restore strategy for the Apriori code and database
- shutdown the Apriori system in the event of a full system shutdown
- establish Unix accounts for Apriori users or write scripts that would enable an Apriori administrator to establish the Unix accounts
- help resolve problems with Apriori that appear to be system related
- install any additional software (e.g., perl) that is necessary for optimal functioning of the product
- modify system tables to support various user interfaces, if necessary
- establish automatic restart procedures in case of system crash or reboot
- upgrade operating system
- create backups of critical system-related file systems
- monitor system performance
- monitor hardware error reports, security logs, etc.

Applications Management
- act as liaison with vendors
- monitor upgrades/batch releases
- initiate service calls and escalate to systems manager when necessary
- member and participant of Apriori (national) user group
- provide programming support for service including specialized programming to augment service (e.g., e-mail triggers and client data extracts)

Member Services

Marketing
- promote PennTIPS to units across campus
- develop service level agreements
- maintain web page
- act as the PennTIPS point person
- serve as liaison among members and the management committee
- follow-up with clients to assess needs and client satisfaction
- advise potential member organizations on policies and capabilities
- arrange demonstrations and training
- configure web access to Apriori system

Apriori database administration
- create host user accounts
- track and account for Apriori usage
- track in-kind contributions
- generate reports for member services (D&O reports, document usage, etc.)
- coordinate upgrades for WIN95 clients internally
- communicate operational information to members
- provide operation functions for marketing the service
- implement work flows (work with Marketing to see if Apriori is meeting needs - create queues, work with content group on symptoms and indexes)
• update the Apriori message of the day and perform other host user functions

Training Coordination
• train the trainers (each group has point person - train their peers in organization)
• reinforce the proper use of Apriori documents
• create and gather training materials and documents

Content Management

Data Administration
• research and resolve client data questions
• respond to special run requests by PennTIPS team
• coordinate and implement changes at the request of PennTIPS team
• coordinate and implement changes imposed by source systems
• coordinate and implement changes imposed by technology upgrades
• monitor data updates for success
• resolve and correct problems
• work with ISC data administrators to implement regular client data feeds to Apriori system

Technical Writing Coordination
• design look and feel of web and other documents
• design editorial review
• manage the document review process
• review and edit new & revised documents
• coordinate documentation efforts among schools and departments
• review and maintain Apriori internal index structure and symptom list
• manage web-based provider information

Technical writing
• assist with writing responsibilities
Appendix C: Participants

Current Participants:

**Mike Dettinger**, Help Desk Analyst for ISC Client Services Group, is charged with the daily administration of the Apriori server and the introduction of this service to other groups within the ISC. Michael has a strong customer service and networking background, serving in various roles with the ISC Networking Group before joining the Client Services Group two years ago. (since February 1996)

**Cathy DiBonaventura**, ISC Outreach Coordinator, joined the Apriori pilot team in April of 1997 to facilitate the writing of the PennTIPS Business Plan.

**Michael Firstenberg**, Information Systems Specialist with Desktop Computing Services for SAS Computing brings six years of front-line and second-tier support at Penn to the team. After Emily Corse left the team, Michael took over as a Data Administrator in addition to other roles. Additionally, Michael served on the Document Quality Assurance team helping to determine the basic structure for the indices, keywords, symptoms, and documentation of the Apriori system. (since September 1996)

**Bonnie Gibson**, Executive Director of Administrative Affairs for the Office of the Provost, and former Director of Finance and Administration for Information Systems and Computing. She is the IT Steering Committee liaison for the Linking Help Desk Across Campus pilot project.

**Jim Johnson**, Senior Data Analyst with ISC, worked with the Project Team to develop data requirements for the Client segment of the Apriori database. Then, using these requirements worked with the staff from ISC's Administrative Information Technologies to develop, test and implement software for a weekly data interface which provides the Apriori system with current client information. (June 1996 through April 1997)

**Michael Kearney**, Director, ISC Client Services Group, has been providing computing support at Penn for 19 years in research and academic computing in the School of Arts and Sciences from 1978 to 1991, and ISC from 1991. Together with Katie McGee, he provided management leadership for the team, and developed the data import process for University client data.

**Katie McGee**, Senior Director, SAS Computing, Customer Services and Planning, has been providing computing support at Penn for 11 years first with the ISC and now with the School of Arts and Sciences. Together with Michael Kearney, she provided management leadership for the pilot team. She also played a strong role in the outreach efforts to demonstrate Apriori to colleagues across the University. (since February 1996)

**Kristin Nelson**, Senior Consultant for the ISC Support On Site group, brought to the team the dual perspective of an ISC support provider with years of front line experience at the Computing Resource Center and as a local support provider currently supporting the President and Provost centers. Kristin acted as the team leader for the Document Quality Assurance (Content) team which determined and reviewed the Apriori index structure, symptom keywords, documentation templates, and document status. (since February 1996)
**Lila Shapiro,** ISC Systems Engineering, provides Unix system administration services to the PennTIPS project. She has extensive experience in systems administration, project management, and customer support acquired in various roles within the ISC and SAS. (since February 1996)

**Kristofor Varhus,** System Programmer with SAS Computing's Workstation Services Group, joined the team to provide assistance with programming and system administration. Kristofor has worked on various technical projects with the team, including the implementation of an e-mail interface to Apriori. (since January 1997)

Other Contributors:

**James Brewer,** Help Desk Analyst for the ISC Client Services Group, participated on the Document Quality Assurance (Content) team from October 1996 to January 1997. His role as a front line ISC consultant provided insight to the documentation needs of the client and technical staff. As an initial Apriori user and document content provider, James' experience proved invaluable.

**Emily Corse,** former Manager of Desktop Computing Services for SAS Computing, brought years of experience in customer support at Penn in both front-line and managerial roles to the original Apriori implementation team. Emily has since moved on to become the Manager of Computing Support at Philadelphia College of Textiles and Science. She provided leadership in roles as a Data Administrator and a member of the Apriori Management committee. Additionally, she was heavily involved in the promotion of its use and in the training of SAS users. (February 1996 - September 1996)

**Bill Gilmore,** Lead Programmer Analyst, wrote specifications, designed and implemented the PENNcard-to-Apriori interface. (July 1996 through November 1996)

**Tony Olejnik,** Senior Network Consultant for the ISC Networking group, participated on the Linking Help Desks pilot team from February to July 1996. Tony brought to the team his experience as a secondary support provider on campus and his expertise in networking and technical areas.

**Judy Smith,** Technical Writer for the ISC Communications Group, participated on the Document Quality Assurance (Content) team from October, 1996 to January, 1997. She was invited to join the team due to her years of experience as a technical writer and editor. Judy provided insight to editorial processes and documentation standards.

We also acknowledge the contributions of the staff of Information Systems and Computing and the School of Arts and Sciences who supported the efforts of the pilot team.