Conferencing Selection and Implementation:
University of Arizona Case History

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ABSTRACT

The University reviewed various computer conferencing options during a two year period and began implementing CoSy in fall 1987. During the initial 4 months over 500 user accounts were established. The general approach involved educating critical personnel, adding users in groups where communications needs existed, penetrating key organizational units at all administrative levels, and focusing on developing a "conferencing culture" on campus. Included are specific software selection criteria, examples of implementation policies and approach, and guidelines for new conferencing installations.

INTRODUCTION

When the University of Arizona decided to implement a conferencing system, the general campus knowledge of the subject was minimal, though a few (half dozen) people could be identified as experienced users of computer conferencing. The University, a comprehensive, research-oriented, public land grant institution with 31,000 students and 12,000 faculty and staff, includes 12 academic colleges and associated research centers, in addition to the Cooperative Extension Service, focused in 15 counties, and 4 rural-based College of Medicine units. It is one of three universities in Arizona, all under the same governing board.

Both before and during implementation, the literature and experiences of other installations (primarily CONFER, EIES, and BIX) were reviewed. Observation was also made of other systems by joining to discuss issues with their users. Time was spent in establishing a conferencing culture as well as examining technical use and specific applications of the system.

We will review the evaluation process and implementation choices, as well as suggesting "guidelines" for implementing a conferencing system. Specific examples of conference types and user statistics are included as appendices. As a beginning, however, a brief review of some recent University history will be helpful in understanding why certain approaches were taken.

UNIVERSITY SETTING

Following the appointment of a Presidential (new president) Task Force on Information Services in 1982, we had been examining and evaluating the concept of electronic conferencing. In spring 1983, a committee recommended installation of a computer conferencing/electronic mail system. This was followed in 1984-85 by an Electronic Communications Committee, which assessed electronic mail and computer conferencing systems. This committee again justified the need, provided examples of commercial and specialized systems, and developed a general evaluation of four conceptual options (commercial computer conferencing software, consortium group software exchange, in-house programmed, and VAX based commercial electronic mail).

While no specific campus-wide system existed, several electronic mail systems were already in use at the University, generally with clearly defined user groups. These included POSTMASTER (on Prime), VAXMAIL (on VAX), COSTAR (on VAX), PROFS (on IBM), and several electronic bulletin boards (including a network of county to campus computer FIDO bulletin board mail transfers). Several departments also used BITNET and commercial electronic mail services for off-campus communication.

From summer 1985, major changes had occurred in central computing activities, including reorganization of all independent computing and communication units under one person; shifts to a different vendor for administrative computing; purchase of new software and a new database for administrative computing; shifts to another product line for instructional and research computing; and installation of a mini-supercomputer. A 2-year project began in spring 1987 to replace/upgrade the telecommunications system (rewire each office to include data and voice lines as well as new telephone equipment and data networks).

In the six years that ended December 1986, the University had acquired about 4000 microcomputers, 2100 terminals, and 1000 modems. A number of faculty, staff and students also owned private units (both at home and work). To add further importance from another perspective, an ongoing strategic planning process had also identified campus communication and information flow as a weakness.

In summary, we had recently experienced 1) very significant hardware and software shifts for mainframe computers, 2) reorganization of major computing and communication units, 3) purchase of a number of terminals/computers, 4) greater technical capability for improving on-campus communication, 5) formal committee studies of computer conferencing and electronic mail options, and 6) recognition and admission of inadequate campus communications. Thus, we were in a special position to implement a computer conferencing-based communication system; but we were still learning how the new organization would work, had suffered future shock and burnout from so many recent computing changes, and had no "culture" on campus on which electronic communication could build. We did have a few experienced individuals and several broadly based campus champions of the concept.

CONFERENCING SOFTWARE SELECTION

The Electronic Communications Committee report of spring 1985 evaluated 95 commercial and non-commercial electronic mail/conferencing systems and, based on required/desired features, developed a list of attributes for many of these. Using these data, a group of 4 reviewed conferencing systems for central facilities available at the time, including CONFER, EIES, PARTICIPATE, PARTICIPATE, CAUCUS, COSY, COM, and e-FORUM. Because of hardware requirements and major features, this list was reduced to 3: CAUCUS, COSY, and PARTICIPATE.

After a 25-member group reviewed these finalists (for documentation, individual account signon, evaluation summaries, and group demonstration/questions), CoSy from the University of Guelph was the final selection. The 2 most important criteria were 1) capability for common conferencing activities and 2) ease of learning for beginning and advanced users. VAX/VMS hardware was also chosen to run the software (another hardware option was IBM 4381). The full evaluation list is in Table 1.

Table 1. Selection Criteria

High Priority

Company	(reputation, years product available, financial status)
Ease of access	(by multiple devices and including microcomputer transfers)
Ease of using	(by experienced and novice users)
Hardware	(requirements and resource demands)
Help files	(variety, size, content, ease of understanding)
Learning ease	(by experienced and novice computer users)
Limitations	(relative to our desired features or software function)
Mail portion	(ease of use/capability of mail as separate function)
Missing features	(any common conferencing features not present)
Required changes	(needed before possible purchase)
Screen clarity	(general format and information provided)

Medium Priority

Costs	(initial, revisions, updates, additional copies)
Grapevine	(what others say)
Manual	(type and clarity of hardcopy documentation)
Other installations	(number and types of experiences)
Pending revisions	(near term changes planned by vendor)
Uniqueness	(special software features compared to other products)

All evaluations had significant involvement by users, as well as those responsible for systems analysis, documentation, and training. Participants, selected from various campus administrative units, included both faculty and staff. It should be noted that the VAX/VMS version of CoSy was in the process of final conversion from the UNIX version; accordingly, we were able to influence the inclusion of additional features (at additional expense).

To establish an adequate user base, key people in major institutional units were asked to help implement their areas (find new users, get them started, provide advice to CoSy management team). This time investment around the campus probably adds another 1.0 FTE to implementation costs. As others accept CoSy, its use is being "institutionalized" to ease addition to normal activities.

Policy choices

Several policy choices, made early on, have guided the implementation process. New issues are generally addressed on demand, and current policies are modified in consultation with selected key users. Major policies are --

1. Initial users to be added as groups
2. Groups or units to include all administrative levels
3. Particular attention to be given to selected high-impact groups
4. Education about "conferencing culture" to be very important
5. Network of campus-wide "helpers" to be developed
6. Organization and policy to remain flexible as changes occur
7. Moderator status to be limited until "culture" is established

Training

In the early trial period, training support was largely informal, unstructured, and self-administered; that is, scheduled Cosy classes were not integrated into the standard CCIT computer training series. Instead, trial groups were given one-on-one and customized small-group sessions. Conferencing culture and the anticipation of organizational or behavioral change was stressed in the sessions. Online tutorials were installed as self-administered training aids. By design (or accident), this scheme worked better not only for training purposes but also for "selling" conferencing during the introduction phase of implementation. Moreover, the early involvement of high-level administrative users dictated that specialized (vs packaged training) be provided.

Current training support has evolved into several forms:

- Self-help training by online tutorials for beginning and advanced users
- Quick documentation guide and reference materials (mailed to all new account holders)
- Availability of a "consultants" CoSy mailbox or regular telephone for help (621-HELP)
- Live training delivery now provided in several ways:
- Departmental sessions arranged and led by the user departments, with CCIT providing facility or staff assistance
- Regularly scheduled training sessions sponsored by the Center, aimed at providing instruction on mechanics of using CoSy
- One-on-one training and special sessions arranged by request, normally for university executives or groups/departments requiring customized training support to expedite CoSy adoption in their department

IMPLEMENTATION

The CoSy implementation will take an estimated 9 months (this paper was developed at the 7 month stage. In the sections that follow, specific aspects of the implementation are given, with an overall schedule in Table 2.

Table 2. Implementation Schedule

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Month/year              9/86 10/16 11/86 12/86 1/87 2/87 3/87 4/87 5/87 6/87

Install software (test) *******
Install software (open)      ********
Educate key personnel   ******
Early test groups (6)         *********
Campus seminars/articles  *  *                            *   *
Additional groups (10)            **************
Feedback (formal)            *                        *
Open to all users                                     *
Pilot instruction courses                            ****************
Install new version                                                  ***
Implementation complete                                                *
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System Configuration

CoSy is connection load-balanced among 3 clustered VAX/VMS 11/780 computers, also used for general support of computer instruction classes. All users must log in through a captive VMS account, with individual identification determined by CoSy. Access is gained by a large data switch (IDX-3000) and is accessible by direct connection, modem, or Sytek broadband network. Because of security, general user accounts cannot now access CoSy. Campus users are not charged for use but must have Access Forms.

Organization and Personnel

Formal CoSy installation is provided by the Division of Telecommunications, Center for Computing and Information Technology (CCIT); other divisions within CCIT provide user help and documentation. A 4-member management team (Director of Telecommunications, Telecommunications Systems Operator, User Support Manager, and Chair of User Advisory Committee) manages the installation, with the help of an 8-member User Advisory Committee, about 5 staff, and peer assistance by CoSy users. Early months of installation required an estimated 2.0 full time e-quivalent people (FTE); an estimated 0.5 FTE is anticipated after maintenance level is reached. Early time commitments included making some software modifications, identifying and printing documentation, developing a conferencing culture, establishing administrative procedures, marketing, and isolating software bugs/desired features of the new CoSy VMS version.

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Most user training is by online tutorial, with ability to read instructions several times. Material is divided into an elementary tutorial for new users and a more detailed and lengthy tutorial for advanced users.

The group training approach, especially if arranged by the user departments, has advantages:

- Commitment from a departmental leader precedes training
- Group members practice with one another, not strangers
- Session can be designed to be task-oriented immediately (e.g., practice with a conference will be continued on the job)
- A network of peers who can help each other with CoSy use is started
- Drawing trainers from user departments reduces staff training costs

The implementation team noted that the training design per se was not as critical in speeding up CoSy adoption as was the user's perceived need to use the system because it has become job-related. The most active conferences involve groups where management "legislated" its use as an official communication tool or important job-related information is being exchanged online.

Information provision

Several approaches were taken to provide information on conferencing throughout the campus.

1. Campus seminars

Computer conferencing was introduced to the campus in 2 seminars, open to all faculty, staff, and students. The first, which preceded the 4-month trial implementation phase, aimed at introducing the audience to conferencing concepts and culture, rather than mechanics of the CoSy system. Possible uses, others' experiences, and the implementation plan were presented in the 4-hour seminar, which ended with a very brief Cosy demonstration.

The second seminar was timed for the end of the trial period, since the campus was already familiar with CoSy implementation and many were eager to start using the system. The seminar was therefore designed to be more action oriented than lecture intensive. Seven workstations were set up to demonstrate CoSy use with different access equipment (PC's or terminals) and connection (direct or dial-up). A help desk was available to answer questions, provide documentation, and process account application forms.

Both seminars included off-campus consultants and on-campus users. By the second seminar, enough users were on CoSy to enable campus-wide participation in seminar content planning and demonstration sessions.

2. Publicity

"Cosying" quickly became a household word on campus during the trial period. Those who used it heavily became active promoters; word of mouth, informal group

exchanges, small-group presentations, and actual system use were natural publicity channels. Coverage was also obtained in established publication channels such as the University staff newspaper, campus computing newsletters, bulletins and flyers, and the formal University administrative mailing service (deans, directors and department heads). Information packets intended only for trial groups migrated to many others, widening curiosity and interest in CoSy.

3. The "Ombudsman"

The implementation team succeeded in reaching many campus departments and users through the efforts of a strong "ombudsman". Initially a recognized academic and administrative campus leader became the CoSy spokesperson in many department meetings, special presentations, small-group discussions, and task groups. These sessions included helping particular administrative units or groups understand how they might use CoSy in normal activities (with examples developed when necessary). Subsequently, a small group of special ombudsmen emerged to carry on these efforts. From small cafeteria discussions to high-level administrative meetings, the advocate and ombudsman stirred interest in this new communication tool.

4. Newsletters

An online newsletter (about 1-2 screens) and a hardcopy newsletter (2 sides of 1 sheet) highlight activities. All CoSy account holders receive the hard copy, directed more at recent users or those who may not have tried the system.

5. User Feedback

Questionnaires were distributed to groups at the end of the trial period. Of the 116 active users (signed in at least once the previous week), 83 responded. Comment highlights include --

- Most users learned about CoSy from colleagues (65%)
- Most learned by self study (66%)
- Most thought they were "average" users (78%)
- Most had no problems getting started (71%)
- Most used personal computers for access (84%)

Asked the single best thing about CoSy, 30% said ease of use; the single worst thing noted was verbose editor (22%) and slow response (19%). Useful support features were new user tutorial (60%), Quick Start Guide (55%), Reference card (50%), online help (50%), and advanced tutorial (48%).

Several open conferences also serve as repositories for continuing CoSy feedback and discussion (Table 3).

CoSy Consulting (a "consultants" account) was also created to provide a mailbox for posting questions on use; a designated consultant logs in at least 3 times a day. As need expands, consultants will be added to this activity. At the University of Arizona, the term "consultant" is used for help on any computing problem, so that term was selected as the CoSy help account. The consultants' account is an active participant in general informational/support conferences.

Table 3. Feedback-Related Conferences

Name	Description
.help	submit questions on CoSy usage
.hints	general CoSy usage hints
apply.cosy	open discussion of possible CoSy applications
bugs.cosy	report CoSy bugs
feedback.cosy	suggestions and/or general feedback re CoSy
moderators	Discussion area for conference moderators

Note: bugs.cosy entries are periodically submitted to the U of Guelph

When appropriate, consultants also respond in conferences such as .help, feedback.cosy, bugs.cosy, and culture.

Most of the training load is addressed by tutorials and peer help, with relatively few questions coming to consultants. Typical questions include help with communication or terminals, initial entry into CoSy, using editors, and a few system commands.

APPLICATIONS AND USE CHARACTERISTICS

The initial user community was identified as groups, and attempts were made to get new groups that had some overlapping membership with existing ones (Table 4). After a short time, group representatives requested additional user accounts (all were granted as long as the group had a need to communicate).

Table 4. Growth Rate of Arizona CoSy System

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date	moderators	listed confs	members	key events
Sep 1	4	0	4	Testing early release v 1.0
Nov 1	4	10	4	Testing release v 1.0
Nov 15	10	15	10	Open to select groups
Nov 30	15	19	40	
Dec 31	23	32	122	
Jan 31	27	46	204	
Feb 28	50	50	400	Open to anyone if interested
Mar 15	71	65	504	

When new accounts were entered, the materials sent to the user included a page on why group accounts were important, how to plan group meetings, the importance of proper equipment, and a list of critical success factors for conferences. The types of current (March 1987) conferences are in Table 5.

Table 5. Types of Conferences

Type of conference	Total Number	Number Open
Administrative	16	0
Conferencing culture	3	3
Information sharing	20	18
Implementation of CoSy	23	12
Teaching*	3	1

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* We implemented a second version of CoSy entirely devoted to instruction (actual teaching activities); the use of this version is just beginning.

Programs were written to produce 2 weekly CoSy use reports, which establish a "pulse" on system growth related to connection load on the VAXen. Generic user trends were established. Data and trends observed will be used to plan future resource expansion to support the growing user population. The first report is a histogram plot of the number of simultaneous CoSy sessions in use versus time of day for the entire week (see Appendix A). Currently, (early March 1987) the average daily load of about 7 to 8 users during prime time (400 accounts have been established, out of which approximately 200 used the system in the previous week). A peak number of 18 CoSy users occurs briefly.

The second report provides a weekly session summary and histogram plot of number of sessions vs length in minutes. Distribution of sessions has been remarkably consistent over the past 3 months (a growth from 40 to 200 active users). Average CoSy login session is currently 13 minutes long and average time per active user is 2 hours a week, representing "generic users" for planning purposes. Individual users exhibit fairly large variances around these averages.

CURRENT ACTIVITIES

Penetration of the University Community

Approximately 35% of the administrative units on campus have at least one representative on CoSy, while some units (departments, colleges, administrative offices) have their entire faculty or staff on the system. Current efforts are focused on improving the efficiency of these units, as well as continuing educational efforts toward establishing a conferencing culture.

After the second seminar, we held a special training session for moderators, which doubled the number of those having this privilege. The moderators will increasingly be used as key managers/users and take on an added role in educating users in areas other than the simple mechanics of conferencing.

A pilot course has been established to allow faculty to observe (and participate) in a teaching setting to determine if they would like to use the system in their fall 1987 instructional activities. In addition, two instructors will

use CoSy as an adjunct to their classes in spring 1987 to gain experience under realistic classroom conditions.

Finally, a conferencing evaluation committee was established to review both the implementation and the use in teaching situations.

Impacts on Users

While we have not had sufficient time to fully understand the changes brought by installation of the conferencing system, there are already some clear changes in behavior. The major impacts experienced so far are --

- increased participative involvement
- increased "committee" membership with a formerly small committee becoming new executive committee but adding more "general" members
- decrease in phone tag among participants
- fewer face-to-face meetings
- decrease in lost conversations among participants (a lost conversation is one that takes place between members of a group SUBSET but contains information the ENTIRE group needs to hear)
- increased information between different user groups
- information sharing and request for comment prior to decision making

Checklist for Successful Implementation

The situation at the University of Arizona is not unique, but our experiences cannot be simply extrapolated to other sites. However, we have learned a few things and confirmed some other's observations. A checklist of possible success factors is in Appendix B.

Risks and Pitfalls

There are certain situations that are risky during the implementation process. A few we found of particular significance included --

- Failure to achieve a critical mass of users fast enough to encourage routine use of the system
- Allowing a large amount of bugs which impact user impressions to remain in the system
- Assuming the package has reasonable message security for your application. Check out the message data security and protect it yourself.
- Eliminating physical meetings entirely; this type of meeting is still important.
- Neglecting to keep an eye on computing capacity. Project success can be adversely affected by long delays, downtimes, and login queues.
- Adding too many new users too soon, so the old users cannot be helped adequately.
- Allowing the culture aspects of education in conferencing use to lag, by giving too much attention to new user signons.

CONCLUSIONS

The University of Arizona took over 3 years to evaluate various aspects of electronic mail and computer conferencing, although the need for both was clear early in the process. This delay was caused by major organizational shifts, new administrative hardware and software installations, and changes in the communication system. This amount of time, however, allowed an opportunity to educate portions of the campus community on relative merits of computer conferencing.
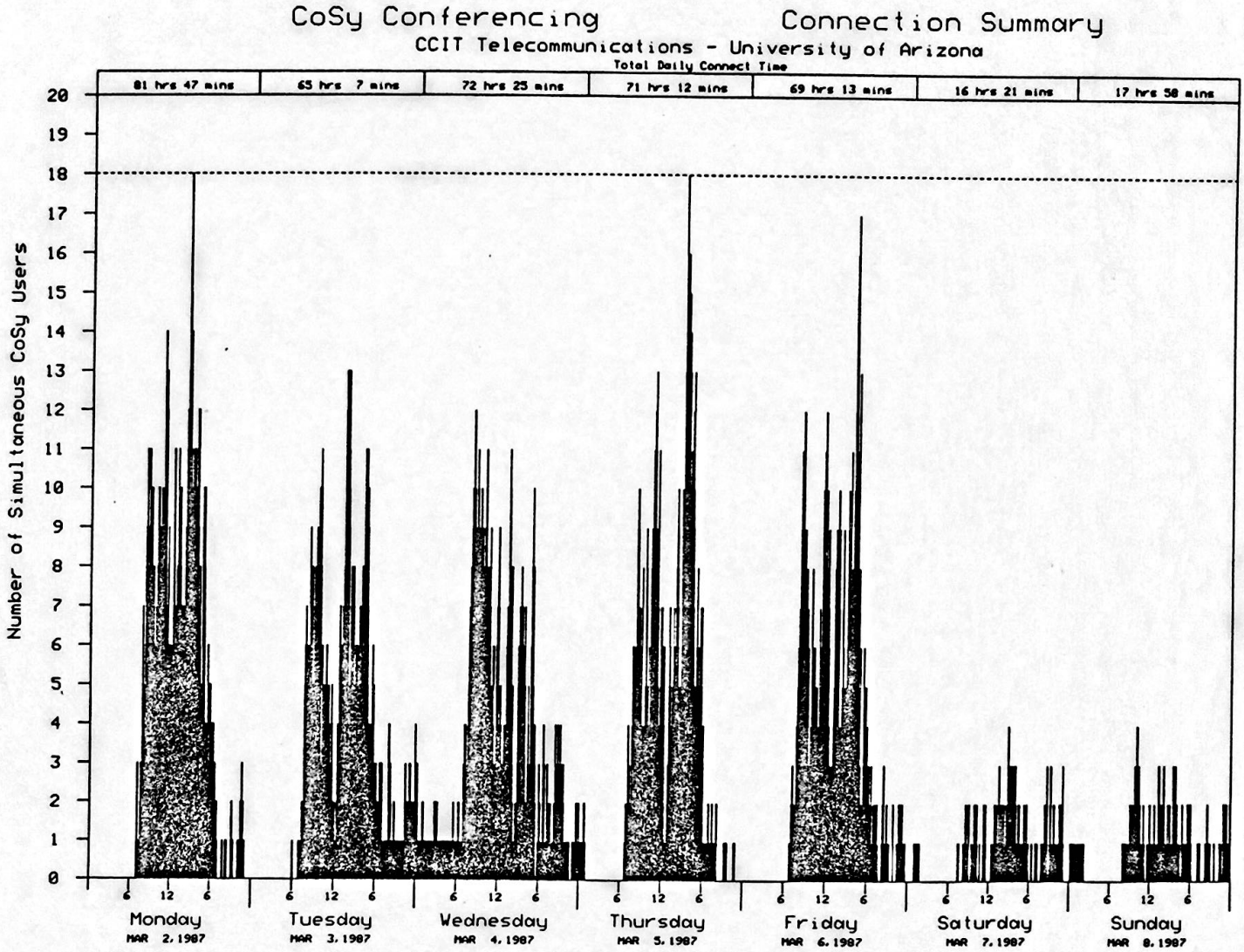
During a four month period we installed the CoSy conferencing system to penetrate about 35% of the administrative units on campus, with over 400 users. The approach included 1) focusing on groups with an existing need to communicate, 2) educating groups on conferencing impacts as well as technical needs to be functionally literate, and 3) adding principal members of institutional units to establish a network representative of the campus. The campus view of computer conferencing as a tool has become increasingly favorable. The main drawbacks hampering it use as a tool are limited computing capacity (of the current hardware) and unresolved software bugs in the initial VAX/VMS version; remedies are underway for both of these limitations.

USER STATISTICAL INFORMATION

## COSY CONFERENCING CONNECTION SUMMARY

Week of March 2-8, 1987

CoSy Conferencing   Connection Summary

CCIT Telecommunications - University of Arizona

Total Daily Connect Time

| 81 hrs 47 mins | 65 hrs 7 mins | 72 hrs 25 mins | 71 hrs 12 mins | 69 hrs 13 mins | 16 hrs 21 mins | 17 hrs 58 mins |

Number of Simultaneous CoSy Users

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| MAR 2,1987 | MAR 3,1987 | MAR 4,1987 | MAR 5,1987 | MAR 6,1987 | MAR 7,1987 | MAR 8,1987 |

COSY CONFERENCING SESSION SUMMARY

Week of March 2-8, 1987

CoSy Conferencing   Session Summary

CCIT Telecommunications - University of Arizona

DAY	DATE	# SESSIONS	# USERS	TOTAL TIME	AVE PER SESSION	AVE PER USER
Monday	MAR 2, 1987	320	121	80:46	:15	:40
Tuesday	MAR 3, 1987	277	121	63:27	:13	:31
Wednesday	MAR 4, 1987	319	117	71:41	:13	:36
Thursday	MAR 5, 1987	355	133	70:06	:11	:31
Friday	MAR 6, 1987	320	135	67:46	:12	:30
Saturday	MAR 7, 1987	57	28	16:13	:17	:34
Sunday	MAR 8, 1987	47	23	17:47	:22	:46
Week summary		1695	199	387:46	:13	1:56

Number of Sessions

8 sessions longer than two hours

Session Length in Minutes
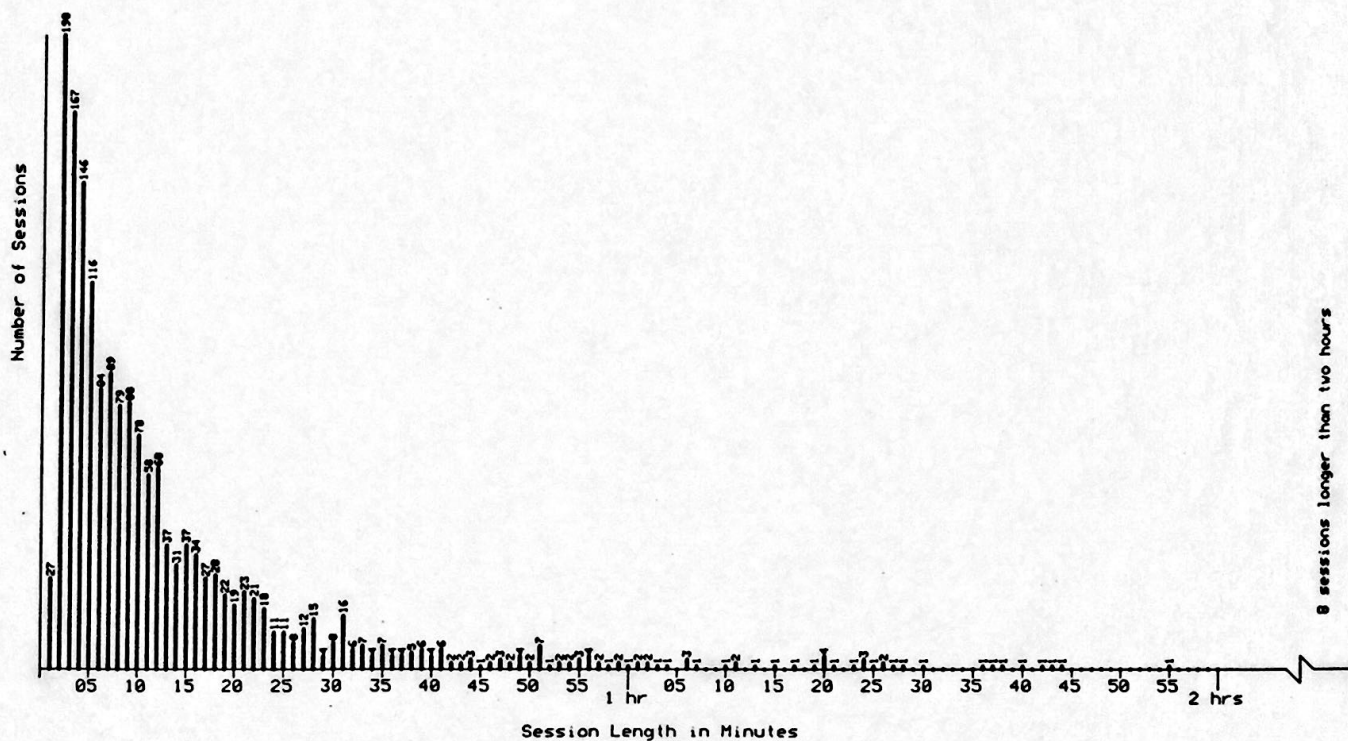
Appendix B

CHECKLIST FOR SUCCESSFUL IMPLEMENTATION

The University of Arizona provides an example of a large, diverse institution with only limited electronic mail service and no computer conferencing "culture". Thus, the selection of success factors will differ from institutions where electronic communication experiences were more ingrained. The following checklist is based on our experiences:

- Identify and recruit key personnel who have the willingness and political power to encourage others to use the system.

- Create a few interesting open conferences for general use and discussion (as well as fun) so new users can see messages, even if not involved in any mainstream "working" conferences at the moment.

- Once key people are adequately exposed to the system, push for a critical mass of users - if a new user can't converse with the right persons, the system will be abandoned. Critical mass is very important. More groups are added to mix with existing groups to fill gaps.

- Initially add groups of related users who have already established needs and are communicating. Conferencing used as a tool to supplement existing groups works well.

- Be very conscious of how conferences, messages, and structure look during the early stages. People tend to mimic pre-existing examples. This is the best opportunity to guide overall system form.

- Remember each user belongs to a different set of conferences and thus sees a different picture. One may think the system is used heavily while another sees little activity.

- Strongly encourage free format personal resumes, which help greatly in establishing a user id as a person. We encourage users to include both work and outside work interests in their resume.

- Encourage users to keep in the back of their minds that messages should generally be written with an eye toward present, as well as future, audiences. This is a notable difference between conferences and face to face meetings.

- Connectivity is critical; users need convenient, daily access to equipment before they get accounts.

- PC communications software: recommendations/guidelines are helpful, especially if users are non-mainframe users.

- Continuing user involvement in the implementation process, identification and involvement of user advocates system .

- Recognition and publication of technical limitations of the system, including known bugs, peak load impacts on response time, processing or file quotas (if any).

- Effective moderators are important! Moderator support should be identified and provided.

- Conceptual discussions of conferencing should be continued beyond the initial implementation phase (e.g., culture, etiquette, conferencing misuses, blunders).

- Encourage innovative uses of conferencing to widen its appeal and usability.

- Provide for long-term planning of support, including computing capacity, accounts handling, general support services, data security, data archiving and purging policies, maintenance issues, compatibility with other communication/mail systems.

- Critical mass participation is necessary; critical mass dissatisfaction is potential if system support is weak.

- Continue logging or monitoring group experiences to provide basis or framework for evaluating upgrades and/or alternative conferencing systems in the future.