Research and Planning
Annual Report 1994-1995

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Events of the Year 1

Service Portfolio 1

Total Quality at ITD 1

Network Planning Working Group (NPWG) 1

End-User Data Access (EUDA) Task Force 2

Access Policy Working Group (ACCPOLWG) 3

Internet Use Working Group (IUWG) 3

E-Mail Planning 4

Facilitators' Guild 4

Implications Wheel 4

Training, Conferences, Presentations, Facilitation 4

Progress toward achieving this year's goals 4

Long-term goals 5

95-96 Goals 6

Contribution To Inclusiveness And Cooperation Among Units 6

Strengths, weaknesses, opportunities and challenges 6

Anticipation of the Future 7

Workstation Internet Servers 7

Implications Wheel 7

Doing Business Electronically 7

Business analysis and planning 7

Benchmarking 7

Revisit E-Mail 7
Better planning based on data 7
Reaffirmation of our commitment to Quality 7
Technical direction effort 7
Discontinuance of PROFS & BITNET 8
Mass Electronic Mailings 8
Keeping Customers Informed 8
Characterization of use of Internet Link 8
DATA 8
SURAnet Usage 8

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EVENTS OF THE YEAR

Service Portfolio

The Service Portfolio effort was the result of a plan that came out of strategic planning training. The intent of the plan was to create an ITD service portfolio and reorganize ITD to best provide the services. This effort began in early March, 1994, and was expected to be complete by the early fall.

R&P, along with Martha Talbott and Linda Chiappe, was a permanent member of the Service Portfolio team, whose membership also included 2 to 3 additional people who varied depending on the phase of the effort.

The criteria by which the services would be measured were defined by June and were further refined in September. By the end of June, information had been gathered through a series of workshops on all possible services that should be considered for the portfolio. The intent was to help build the foundation for recommending services to be included in ITD's portfolio.

The effort to consolidate the information and relate it to the criteria turned out to be difficult due to the massive amount of data. Preliminary results were available by late September, and the final list of services was complete by October 17.

The effort involved at least 84.5 hours of meetings with at least 5 people in addition to the 130 hours from the previous year for a total of at least 26.8 person-weeks of work.

Total Quality at ITD

R&P spent considerable time and effort helping with the planning for the reorganization, including identifying and recommending the book *Whole Systems Architecture*, giving presentations to the Quality Council, and putting the reorganization document in final form.

R&P is participating in work on the Help Desk Voice Menu design.

Network Planning Working Group (NPWG)

R&P leads the Network Planning Working Group, which grapples with the technical aspects of networking issues that need to be addressed and makes recommendations on how to address them. It meets monthly. Its regularly attending members have been Perry Eidson, Ken Mandelberg, Glen Matthews, Steve Lee, Charles Stephens and Mike Wilhoit. Craig Myers and Alan Dobkin have been regular attendees since January, 1995. Others monitor its LISTSERV list NPWG-L, whose 26 subscribers include I.B. Bates (Public Health), Eric Fliegel (Business School), Bill Goolsby (Anatomy Department), and Eric Peng (EUSHC).

Its key accomplishments include the following:

- The NPWG has been tracking the progress of the IP Reconfiguration Task Force's effort to convert Emory to a new IP network number. The NPWG originally recognized that Emory was running out of IP numbers and recommended action to address the problem that included obtaining 16 class C network numbers to address SLIP and PPP needs and temporary use of an additional class B network number to facilitate switching to more efficient use of class B address space to relieve saturation.
- After identifying the potential impact of MBONE, a virtual, multicast network that transmits video and audio by tunneling through IP, the NPWG agreed that ITD could hold off providing

MBONE service. The NPWG will keep tracking it and consider it for the future.

• After identifying the need for a faster link to the Internet and determining options and costs, NPWG recommended a 10 Mbps fiber link to a SURAnet backbone router at GaTech. This recommendation was eventually accepted for implementation in the fall of 1995 to support the anticipated additional load resulting from the wiring of the residence halls for Ethernet.

• After identifying ISDN as the solution of choice for high-speed remote access, and the need for a data center server to provide dial-in connectivity to the Emory Ethernet, the NPWG encouraged Emory Telecom in its efforts to get reasonable ISDN pricing from Bell South, evaluated and tested ISDN Ethernet bridging and routing products from Ascend and Combinet, and recommended a trial of the Ascend server. As a result, Telecom is purchasing the Ascend model 400 server and some Ascend Pipeline 25 remote brouters for a pilot test.

• The NPWG has identified the need to use Secure NFS. Right now ITD is exporting all cluster file systems to anyone who wants them. There are problems with this approach. First, anyone who breaks root on a machine on the export list can set their userid to anyone other than root and get to ids on the exported file systems, and, for example, read their files. (root on the local system maps to an id named "nobody" on the exporting system.) Thus any weak system on the export list is a security hole. Second, LINUX laptops can now easily run NFS. Someone could get in a non-prominent corner of a lab that has secured UNIX workstations to which home directories are exported, unplug the workstation, plug in the laptop, and use the lab workstation's IP address. They can be root on their laptop, so they can get to other's files.

• The NPWG reviewed the security problem of someone installing a sniffer on emoryu1 that captured passwords from the attached network. It's recommendation that top priority be given to assessing the extent of the damage and making a plan to repair the damage and avoid such problems in the future was accepted by the Open System Group (OSG). As a result, the OSG has put together a plan to better secure the cluster, and the Access Policy Working Group has worked on a plan to enable mass password changes.

• After having focused on modem pool saturation, and the need to upgrade the speeds of the modems, the NPWG reviewed the choices of Telebit, Microcom and USR Robotics proposed by Network Services and recommended USR Robotics as the most cost-effective due to its ability to use T1 instead of individual phone lines. This recommendation was accepted.

• The NPWG is currently looking at how to address the issue of home subnetting, and is tracking firewalls and their use.

End-User Data Access (EUDA) Task Force

R&P acted as facilitator to the End-User Data Access (EUDA) Task Force. The Information Systems Group established EUDA at its 5-year planning session in May 1990. In January of 1992, IS empowered EUDA to recommend a database product along with Application Development Tools and an environment in which to run them. EUDA recommended Sybase and PowerBuilder.

Since the data warehouse project is the solution for providing end-users access to institutional data, the members decided to

take the summer off and work on Access. EUDA has not met since July 1994.

Access Policy Working Group (ACCPOLWG)

R&P began facilitating this group when it was working on policy related to giving all students accounts for use in schedule change in the fall of 1994. This effort was a success.

The group meets only when necessary by conducting some of its business using a LISTSERV list (ACCPOLWG). The members of this list are Linda Chiappe, Peter Day, Ron Foust, Larry Frederick, Barbara Germon, Francene Mangham, Bob O'Halloran, and Betty Troup. Another list (ACPOLREV) keeps others informed. Its 17 members include Scott Anderson (Physics), Ken Mandelberg (MathCS), and Walt Hultgren (Yerkes), with the rest from ITD OSG, Bimcore, UIS, IND, NWS, and Multimedia Communications.

Beginning January 1, 1995, facilitation was turned over to Linda Chiappe so that Peter could participate in his new role as Director of Network Systems.

This group originated the need for people to have a way to change their passwords without having to walk across campus to the data center in the middle of the night. It proposed the concept of PINs to allow people to identify themselves over the phone to request a password change. The concept evolved to become a pass phrase or PAPH.

The group eventually explored the PAPH as a way to facilitate a mass password change in the case that a large number of passwords are compromised, as happened around Thanksgiving, when someone believed to be a non-Emory person broke into emoryu1 and ran a sniffer to capture passwords from the network attached to emoryu1.

The group explored how to make this concept work beginning in March, including holding implications wheel workshops in May.

Internet Use Working Group (IUWG)

R&P has acted as facilitator and leader for the IUWG since its first meeting on November 14, 1991. The mission of the IUWG was to make access to network services easier, especially services that are accessible by means of TCP/IP. The "Internet" part of the name of this group referred to the fact that when it was created, the group's focus was on access to Internet services.

This year the IUWG met monthly from August, 1994, through November, 1995, tracking what was happening and discussing the outstanding issues. One issue that was identified was the need for establishing an ITD work unit that sews up the seams between obtaining IP numbers, installing the software, connecting to appropriate hosts for pop clients, etc., for Internet connections for individuals. This has been realized somewhat by the new Network Systems Department of ITD.

At the November meeting the group decided that the IUWG had fulfilled its mission and would disband. In its place, the Internet Access Team of University Computing Support Services (now the Internet Information Access Team of CRS) would call for people to participate in a new Emory-wide group, which was expected to begin meeting in January, 1995. In the meantime, the IUWG-L list would remain available.

The IUWG sponsored a list called INETUSE for reposts of information about use of the Internet and its resources. The list continues to be popular outside Emory: its

subscribers have increased from 127 to 540 of which only 21 are local to Emory.

E-Mail Planning

R&P has been following E-Mail trends and products while working on other things.

- Investigated use of PGP for e-mail digital signatures and encryption. This technology is not well-enough integrated into current e-mail clients to be easy enough to recommend widely.
- Wrote the Statement of Direction to Discontinue PROFS.
- Gave presentations on E-Mail Addressing and E-Mail Strategy at recent Area Director's Meetings.
- Successfully turned over most of the e-mail effort to other operational groups. The masssmail issue that it investigated last year is now being addressed by a Task Force. Directory services are now being enhanced and supported by UIS DRM and OSG.

Facilitators' Guild

The Facilitators' Guild provides practice opportunities, feedback and hints to new facilitators. Approximately 6-10 people participate in the monthly meeting. Each meeting is proceeded by one or more planning meetings of two permanent members and two rotating members from the Guild. The planners typically facilitate the meeting, thereby giving the rotating members planning and facilitation practice. Peter and Martha act as permanent members of the planning team.

The Guild began meeting monthly in November, 1993, and during the 94-95 year had around 10 meetings. Recent meetings have been an exploration of the steps and processes involved in making a technical decision. This effort has just ended, and the Guild is now involved in planning what it will do next.

Implications Wheel

R&P's recommendation to purchase of the Implications Wheel training materials was accepted. Over three presentations of the material have occurred that have been attended by various ITD staff.

A trial of the Implications Wheel in the ACCPOLWG reaffirmed the advice in the training materials that practice is needed, and the topic used should be non-critical.

Training, Conferences, Presentations, Facilitation

Seminars and Meetings Attended: CISCO ATM, Multicasting in Large Internets, LinkWorks, Perl, ObjectKnowledge, Microsoft Messaging and workflow technologies, Ascend products, Information Technology Council of the University Centers in Georgia

Conferences attended: GOAL/QPC; Comdex; NetWorld+Interop.

Presentations given: Decision Matrices to the Imaging Task Force; Security problems to a group from inside and outside ITD; E-Mail Strategy to the ITD Directors; E-Mail Addressing to ITD area Directors.

Facilitation: Telecom Project, Architecture Next Step, Library Building Design, WWW Forms, PPP Issues

PROGRESS TOWARD ACHIEVING THIS YEAR'S GOALS

The following are the goals for 1993-1994 stated by R&P in last year's report and the status of each.

1. Continue holding IUWG meetings monthly when there is business. Assess by whether I consistently ask for agenda items and hold the meeting when

appropriate, and attendees find them valuable. I held the meetings monthly until the group decided to disband.

2. Continue tracking E-Mail, Office Automation and Work Flow software. Assess by activity. See E-Mail Planning above. In addition, R&P investigated CSO Phonebook and X.500 client software for the Mac and brought various features to people's attention. It also attended LinkWorks and Microsoft presentations on workflow products.
3. Continue holding NPWG meetings monthly when there is business. Assess by whether I consistently ask for agenda items and hold the meeting when appropriate, and attendees find them valuable. Meetings have been held every month except March. The attendees, when asked in December, wanted to continue the meetings.
4. Complete the Service Portfolio effort and reorganization of ITD. Assess by whether or not it happens. It happened.
5. Continue holding EUDA and Access Working Group meetings. Assess by whether I consistently ask for agenda items and hold the meeting when appropriate, and attendees find them valuable. The attendees wanted to stop holding EUDA meetings, and they have ceased. The Access meetings were held in Aug.-Oct., and did not resume until January, when the facilitator changed.
6. Provide leadership in getting additional network usage statistics gathering initiated. Assess by whether we have the statistics for the next annual report. There were plenty of statistics in the report.
7. Continue working to make the Quality Council more effective. Assess using evaluation by members. The Quality Council now meets every three months as the Transition Team. There has been no such formal evaluation by the members.

LONG-TERM GOALS

The mission of ITD Research and Planning is to lead selected planning and research efforts that typically involve more than one area of ITD plus possibly one or more customer groups; identify and promote better ways to plan; promote the sharing of information that helps people do a better job of research and planning; and serve on and provide staff support to the ITD Architecture, Standards and Recommendation board.

The long term goals of R&P are as follows. Progress is assessed by activities contributing to these goals.

- Support the Architecture, Standards and Recommendation board.
- Lead and direct selected planning efforts including planning for implementation of new computing and on-line information services, direct and coordinate selected planning efforts that span multiple areas of ITD, solicit input from all areas affected by a project, and provide leadership in coordinating the needs and efforts of interested parties.
- Plan and direct the implementation of a variety of projects, and communicate information regarding progress and outcome of projects to staff.
- Participate in developing long range strategic plans for the Information Technology Division.
- Provide input into ITD goals and objectives, and work with other ITD directors to create a plan for improvement of their research and planning efforts. Periodically meet with other ITD Directors to track their progress and to develop future courses of action.

- Maintain awareness of current trends, practices and developments by participating in educational programs, professional organizations and activities. Organize activities to bring this information back to ITD and Emory University.
- Manage the research of potential applications of existing and developing technologies.
- Act as technical consultant by advising users at all levels on planning, research and technical matters, providing advice on issues that span multiple types of computer systems, and providing advice and assistance on network design and troubleshooting.

95-96 GOALS

These are the goals in priority order.

1. Help the ASR Board create an initial articulation of an architecture, with associated standards and recommendations, and a process to update it all. Assess by whether it gets done.

2. Continue holding NPWG meetings monthly when there is business. Assess by whether I consistently ask for agenda items and hold the meeting when appropriate, and attendees find them valuable.

3. Facilitate an Implications Wheel workshop. Assess by whether it happens.

4. Continue tracking E-Mail, Office Automation and Work Flow software. Assess by activity.

5. Facilitate a Wall of Wonder or Wave on technology as an experiment in doing technology environmental scans. Assess by whether it happens.

6. Give a presentation on uses of public key encryption and digital signatures using PGP as an example. Assess by whether it happens and by feedback from the attendees.

CONTRIBUTION TO INCLUSIVENESS AND COOPERATION AMONG UNITS

Leading planning or research efforts that involve more than one area of ITD plus possibly one or more customer groups helps units feel included and provides an environment in which cooperation can take place.

STRENGTHS, WEAKNESSES, OPPORTUNITIES AND CHALLENGES

STRENGTHS

R&P has a broad knowledge of information technologies and associated concepts, the ability to learn quickly, and excellent analytical and facilitation skills.

WEAKNESSES

R&P has only one person, and that person is devoting part time to another role.

OPPORTUNITIES

- Electronic Commerce
  PGP and Netscape Commerce Server provide opportunities for ITD and Emory to get experience with electronic commerce and do some business electronically. They provide R&P with an opportunity to help them. Specifically, PGP can be used to freeze a version of a file with a date stamp and signature; to implement a way for a remailer to affix a postmark that certifies the time and date of receipt for delivery; and to offer a

public key repository and validation service.

- Windows95 offers ITD an opportunity to have a standard TCP/IP stack for windows that does not have to be obtained from a separate vendor; to reduce the variability of the user interface between Macs and PCs; and to provide a PC environment that requires less support.

CHALLENGES

- Achieve R&P goals given time demands of other role.
- Lead the ASR board to success.

ANTICIPATION OF THE FUTURE

Workstation Internet Servers

I was struck by an article in a recent MacWorld (July 1995, p. 138) which describes a product called ALI Internet Server for the Mac. Due in 3Q95, it promises to provide DNS, SMTP, NNTP, POP3, Gopher, WWW HTTP, finger server, and mailing-list manager software. I expect to see additional products of this type appear in the next year with availability for other micro environments as well. These products will have interfaces that make them much easier to administer than we are now accustomed. Products such as these will challenge UNIX as the server of choice for these services, and make it easier for departments to do these services for themselves.

Implications Wheel

The Implications Wheel will require practice and fine tuning before it will be much-used in ITD.

Doing Business Electronically

Use of the Netscape Commerce Server will suddenly make it easy to do business electronically, and we will see this taking off by June, 1996. (Probability .8)

Business analysis and planning

We need to learn how businesses identify and understand their markets, get market data and analyze it. We need a way to measure the equivalent of a business' bottom line.

Benchmarking

We need to look to see who has the best implementation of any given process or service, learn from them, and try to do it better. We should look at solutions adopted by very large universities that also produce popular solutions, since solutions used by large organizations have already been proven to scale up.

Revisit E-Mail

At a meeting on March 8, 1994, we postponed doing anything major about e-mail until we saw the outcome of the Service Portfolio effort. Now that we have reorganized, we need to revisit e-mail in light of the progress we have made and see what we need to do next.

Better planning based on data

We need to continue our yearly Hoshin (or other) planning, including looking at what we attempted, what worked, what did not work, lessons learned, and where we need to improve. We also need to begin systematic longer range planning and environmental scans. In addition, we need to identify important indicators to track, and then collect data over time and look for trends.

Reaffirmation of our commitment to Quality

We need to remind ourselves of our vision and values and the contents of our brochure on Putting Total Quality into Action at ITD.

We need an opportunity to look at what we have done and how we have been operating in light of those statements.

Technical direction effort

We need to revisit the Technical Direction constellations that we postponed in April, 1994, and make sure they cover our services and businesses.

Discontinuance of PROFS & BITNET

PROFS will be successfully phased out by March. 1996 (probability .9). A statement of direction to phase out BITNET will be written and BITNET will be phased out by Sept. 1996 (probability .8). LISTSERV will be replaced by majordomo (probability .7).

Mass Electronic Mailings

We will have a mechanism to support mass electronic communication by June 1996 (probability .8).

Keeping Customers Informed

Even with local and indirect support, we still have trouble identifying and communicating with our customers. In general, we need a process by which we can keep the customers better informed of our plans and get input from them. This has been an ongoing problem that has gotten worse over the years as the number of customers has increased with the advent of desktop computing.

Characterization of use of Internet Link

Although we get data on number of bytes that go through the link, we do not know what the mix of services is. For example, we have no data on extent that use of MBONE, gopher and WWW have contributed to increase in traffic. This is one of the basic statistics that Internet providers keep on Internet backbone, and we need to do so too.

We should also probably do counts by Emory subnet number so we can characterize amount and type of usage by Schools and Divisions within Emory.

DATA

SURAnet Usage

The graph titled “Average Daily Throughput of the SURAnet Link” was computed by adding up the total kilobytes transmitted and received for each day of the calendar year and dividing by the number of days that contributed to the total. It shows that the overall growth, which from 1990 to 1993 appeared to be linear, continues to appear to be exponential.

The graph titled “Average Daily Throughput of SURAnet Link” was computed by adding up the total kilobytes transmitted and received for each day of the month and dividing by the number of days that contributed to the total. It shows steady growth in usage until January, 1994, when it suddenly jumps. Then there is another jump in January, 1995.

The graph titled “Maximum Daily Throughput of SURAnet Link” was computed by adding up the total kilobytes transmitted and received for each day of the month and taking the largest of those for the month. It shows that since 1993, the numbers have been consistently larger the next year than the previous.

The graph titled “Peak Utilization of SURAnet Link” is the largest of the input and output link utilizations for each period of time that is reported during the month. Through May 2, 1995, the period was one hour. After that the period varies from around 15 to 20 minutes. The graph shows the 56 Kbps link saturating, and then shows utilization dropping dramatically after installation of the T1 link. Within a year the

peak utilization is approaching saturation again.