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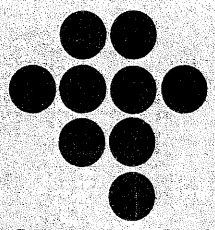

Research
Program on
Communications
Policy

RESEARCH AT BELL

April 5, 1984

Arno Penzias, AT&T Bell Laboratories
Irwin Dorros, Bell Communications Research
Marvin Sirbu (Moderator), MIT

Center for Advanced Engineering Study
Room 9-228
MIT
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Center for International Studies
Room E53-401
MIT
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Center for Policy Alternatives
Room E40-202
MIT
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Laboratory for Computer Science
Room NE43-105
MIT
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Laboratory for Information and Decision Systems (LIDS)
Room 35-308
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MIT
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NOTES ON 4/5 SEMINAR

Professor Sirbu opened the session and welcomed the panel and audience. The focus of the seminar will be on the future of research in the new Bell System spinoff companies. Bell Labs has a very auspicious history, and many people are concerned that the breakup of the Bell System may mean the end of this important research organization.

IRWIN DORROS-Executive Vice President for Technical Services-Bell Communications

Research:

I am of the opinion that research was better off in the days before the breakup than it is today. We currently have constraints that other countries do not have, and this may put the U.S. at a competitive disadvantage. Also there will be a reluctance to find major new thrusts. However, the breakup has also provided new opportunities for the telephone companies, and it is these opportunities that Bell Communications Research, on behalf of its owner/clients, hopes to take advantage of.

Bell Communications Research (Bellcore) is owned by the seven regional operating companies. Currently the organization employs 7000 people. The purpose of Bellcore is to proviide support for the operating companies which is best done centrally. Most of the support it provides is the support that used to be provided by AT&T. Around 90% of the work that Bellcore does is technical in nature. Bellcore's operation is located principally in New Jersey.

Bellcore is intended to be a central organization for support for the regional operating companies. Most of their people came from Bell Labs, many from AT&T and a number from Western Electric and the Bell Operating Companies. Therefore the high quality of their staff is one of the key features of the organization. Bellcore is involved in applied research; approximately 10% of its budget will be spent on research without a short term goal.

Another function of Bellcore is to represent the operating companies in standardizing the interfaces between the parts of the newly fragmented nationwide telephone system. Bellcore's philosophy of the standards making process is that the one who does the most research, planning, analysis and synthesis, before the meetings usually has the most influence in the public standards setting process. Bellcore is doing a great deal of such work on behalf of its clients, and expects to be an important participant in U.S. and foreign standards organizations' proceedings.

Bellcore is also working on making the System of Systems for continuing to operate the best phone system in the world in the post-divestiture era. This set of systems will continue a decade of progress to automate just about everything in the local network administration, maintenance and installation process. A long range goal of the System-of-Systems is to be able to give someone new telephone service while they wait.

Bellcore also documents the technical requirements of the operating companies. Since the companies are obligated to buy equipment from all suppliers in a completely even-handed way, the exact requirements of the companies must be known. Bellcore has recently updated a 1500 page document for local switching system requirements. Bellcore also tests equipment to make sure that it meets the specifications. However, Bellcore does not deal with the purchasing decisions of the local companies. Bell determines which specifications are met and which are not, but does not deal with issues of prices, and will not get involved in the purchasing process at all. In addition, Bellcore does not support any of the new ventures beyond exchange and exchange access the operating companies may be getting into. The organization is intended to support the exchange and exchange access operations of the companies.

Applied research will play an important role in Bellcore's operation. It is expected that approximately 500 people will be employed in applied research. However, this applied research will only be in fields where the operating companies plan to do business. Bellcore does not intend to do work solely to further the cause of science in areas it does not expect to find useful for its owners. The philosophy of Bellcore is that the in-depth underpinings of knowledge flowing from applied research will be the key to the future success of the operating companies.

ARNO PENZIAS--Vice President for Research, AT&T Bell Laboratories

There is nothing inherent in the telecommunications industry that requires the industry to use high technology; AT&T is responsible for that. And, AT&T has not changed that commitment at all. Bell Labs is, and will remain, very much the same as it was before the breakup, the major difference being the size of the organization. Bell Labs is now about the same size it was in 1980, currently employing around 18,000 people. However, the organization is expanding again, and is currently planning new buildings.

Bell Labs serves as the knowledge base for AT&T's technological needs. These technologies are very similar to the ones Bell Labs was involved with before the breakup. They range from making high quality power supplies, to the most sophisticated telephone switching and transmission equipment, computers and software. AT&T Technologies is a manufacturing

driven company, and Bell Labs exists to support it as well as AT&T communications. Since we have divested most of the regulated parts of our business, Bell Labs is getting out of basic economic research which was largely concerned with regulatory economics.

Bell Labs research used to be funded with a portion of the 2 and 1/2% of all phone bills which went to AT&T for centralized services. Bell Labs research is now funded as an AT&T corporate expense which is allocated to all remaining entities. Because of this method, no one group within AT&T has a large degree of control over the types of research which the labs engage in.

The breakup will mean some differences in the way Bell Labs operates. The pace of the research has quickened. Since AT&T is in a more competitive field, Bell Labs must move quickly to make sure that AT&T can stay on the forefront of technology. In addition, it used to be that if AT&T had the same quality product as some other manufacturer, AT&T would most likely get the contract. Now, the operating companies are encouraged to buy equipment from other companies, if they can not prove that AT&T's products are better than anyone elses.

It is still the case that the local operating companies are AT&T-Technologies' customers. AT&T is also committed to supporting the old equipment which the companies own. AT&T Technologies, and Bell Labs, will remain focused on telecommunications, which means a focus on the seven local operating companies, and the overseas market.

QUESTION PERIOD:

Mr. Dorros was asked about the future relationship between Bellcore and the independent telephone companies. He responded that the seven Bell companies account for about 80% of the market, GTE 10%, and the reamining 1500 companies 10%. AT&T used to supply the independents with the standards to interface with AT&T. These independents no longer have any link to the overall system. Currently, Judge Green's rulings are preventing Bellcore from taking on any outside business. However, it seems that he is likely to allow Bellcore to take business from the independents. When asked if it would be in the operating companies' best interests to give standards away, Dorros responded that it probably would in terms of service, but that the companies seem to be driven more by profits at this stage of the game than by service.

Dr. Penzias addressed the issue of how AT&T Bell Labs will deal with the outside world. He said that AT&T used to give some information away because it was barred from getting involved in new areas. Now that AT&T is permitted into new areas, it will not give anything away, but will likely sell or trade its

information. It is likely that Bell Labs will become more competitive in its dealings, new discoveries may show up as patents before they are published, and published reports may be much less technical than they had been. But the depth and breadth of Bell Lab's rsearch will be preserved.

Dorros agreed that Bellcore will operate similarly; they will publish what they are doing, but not how it is being done. He said that since Bellcore does not manufacture anything, it is really in their best interest to give away any techniques which might reduce manufacturing costs.

Dorros discussed Bellcore's role as a coordinating agency for the operating companies in matters of national security. It used to be that there was a central office in Washington that made all of the arrangements for AT&T service, equipment and charges for national security areas. This is no longer possible. Bellcore has assumed the responsibility of coordinating the arrangements from the seven companies, but can not provide telephones, or long distance connections. The Defense Communications Agency has been forced to take a more active role in setting up telephone systems to handle security situations. The Federal government has set up a "war room" in which people from all the different companies and departments now live, and make arrangements for any kind of communications which could be necessary.

When asked if technical innovation would likely mean that AT&T will be cutting more people than before, Penzias noted that AT&T's productivity has increased by 3-4 times the national average recently. AT&T definitely does not see layoffs, or any significant reduction in job security, as an imminent problem arising from the introduction of new technology.

Dorros commented that they lost around five years of progress because of the court proceedings against AT&T. He believes that fewer workers will be needed over the long run, but that any changes will be gradual, and that retraining would be able to accomodate most, if not all, of the workers. He stated that the communications Workers of America Union has been very helpful when dealing with issues of technological change.

Dr. Penzias was asked why Bell labs is getting out of economic research. He stated that most of the economics which Bell labs was involved in was the economics of regulation. It no longer makes sense for Bell Labs to be involved in this since AT&T's remaining business is or hopefully soon will be unregulated. He stated that some of the economists have gone to AT&T, which is still very concerned with economics, and that some of them went to Bellcore. Bell Labs is really only supporting the remaining operations of AT&T. It is, however, an unfortunate side-effect of divestiture that pure economic research seems to have been lost in the shuffle.