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First COSINE User Group Meeting,
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R A Day
4 July 1989

1. INTRODUCTION

The COSINE Project aims to provide a Pan-European network for the international research and development community, both in academe and industry.

This was the first 'user group' meeting for the Project. It was attended by approximately 80 delegates (probably there would have been more if the meeting had not been called at only 2 weeks' notice). The delegates were not true 'users', but representatives of ongoing projects that might like to use COSINE services. (I attended as a representative of the Esprit ARGOSI Project.) This distancing served to make the discussions calm and restrained unlike some user group meetings where actual users are present.

Another unusual aspect of the meeting was that it was being held without there actually yet being a COSINE network. The Specification Phase to COSINE has finished, and the Project is now launched on a 3-year Implementation Phase, due to end in 1991. The purpose of the meeting was to meet potential user groups and find out how they are likely to use the network, once available.

COSINE has developed a significant amount of publicity material, including a video explaining how strategically important the network will be. The crux of this video is a comparison of the need at the turn of the century to standardise Europe's railway services (to move goods around and create prosperity), and the present need to standardise information transfer services (and similarly increase prosperity). Unfortunately the video makes much of the length of time it took to achieve the earlier standardisation, giving ample opportunities for comparisons to be drawn. (It also gave one speaker the opportunity to make an amusing observation. The video points out that eventual standardised track gauge on the railways was 1.435m. He pointed out that this figure originally came about as it was the gauge of the first locomotive built in the UK, and that this in turn used the same gauge as originally used for a horse-drawn train in a remote coal mine!)

The meeting started with a number of talks about what COSINE will provide, and how the project is progressing. Fairly general timescales were attached to the milestones described here. Following this, there were presentations from a number of user groups on how each might use COSINE's services. These covered a fairly wide range of activities, of varying degrees of interest, depending on the novelty of the networking problem to be solved. From the point of view of ARGOSI's Application

Classification work, the more interesting were probably the talks about combustion and flow, marine information services, and possibly the EUROMATH project - see below.

Other highlights of the meeting:

- o The first manifestation of COSINE (excluding the reams of Specification Phase documentation) will be the IXI Pilot. This will provide the international X.25 backbone for COSINE, connecting together member countries' national networks (JANET and BT's PSS in the case of the UK). It will provide 64 kbit access between these networks (as opposed to the 9.6 kbits the PTTs generally manage at present). User group representatives quickly pointed out that they needed 2 Mbit links - this seems to be accepted by COSINE ('where appropriate'). The pilot may be in existence by the end of 1989. It would seem to have some potential for use by ARGOSI - apart from the political desirability of using it, it is uncharged for the duration of COSINE - but the slippery timescales could be a problem. (It has already been delayed due to contractual negotiations with the PTTs involved.)
- o E-mail is targeted as the first service to be run, along with Directory Services support, and good gatewaying facilities to the US. Strangely, there are no specific plans for bulk-data transfer (other than via e-mail ie, no FTAM service). There was concern voiced about this from the floor.
- o User group representatives expressed concerns about the need to standardise applications that are likely to grow up over COSINE eg, standardising the various applications data objects that will be transferred by co-operating applications. This is a recognised problem - the COSINE view was that it as a project has no mandate in this area. It was also thought unlikely that the various ISO/OSI committees would not be able to offer much assistance either - so far it seems to be up to the developers of such applications to do the work and then to submit the results to the appropriate committees for consideration.

The next meeting will be held approximately 6 months after some 'significant progress' has taken place. Presumably this will be the inception of the IXI backbone, suggesting that the next meeting will be held in mid 1990 if all goes to plan.

If ARGOSI wishes to use IXI facilities it will need to contact the RARE Secretariat, who are managing the COSINE Implementation Phase via the COSINE Project Management Unit. A list of contact addresses for this, and for the various user projects presented at the meeting are appended to this report.

The following are descriptions of the talks given at the meeting.

2. COSINE AIMS, ORGANISATION AND STATUS
(Peter Tindemans, Chairman COSINE Policy Group)

Peter introduced his talk with the COSINE Publicity video. The gist of

this was that interconnection is vital to European industrial success. The analogy was made with the earlier need to standardise European railway systems to provide the ability to move materials and goods across Europe. Standardisation of track gauges etc took many years - OSI is the analogous standardisation technique for COSINE.

OSI is seen as vital to COSINE's success. Public carrier services will be used wherever possible. There must also be a 'professional' environment - professional management, rules for operation, and commercial products.

COSINE will also be a federative network - a co-operation of national networking bodies.

The environment that COSINE aims to achieve is:

- o at the first level, shipping data around;
- o at the second level, suitable applications (mail etc);
- o at the third level, specific services for user communities.

The first level is the domain of the PTTs. The second level is the domain of the existing networking bodies. The third level is up to the users to decide. Input is required.

Peter also warned that charging for network services will become a fact of life in the future of COSINE.

COSINE's specification phase is now complete and documented. The project plan is under development and implementation work has started, mainly on IXI (the Pan European X.25 network).

3. ACTIVITIES OF THE COSINE IMPLEMENTATION PHASE (Keith Bartlett, Vice-Chairman, COSINE Policy Group)

Keith outlined the activities of the project. Besides the technical work, there is a lot of political work needed to ensure that the services continue after the COSINE Project ends.

It is believed that services can be made available now. The technology is known and products are available. Two services are envisaged during the 3-year implementation phase.

- o IXI;
- o electronic mail (European and gateways to the US).

These will start 'as soon as possible'.

IXI is based on X.25(84). It will provide 64 kbit end-to-end (at least, hopefully more). It must be available for all researchers. IXI is a backbone, so national feed-networks must be able to deliver as well.

Regulatory and charging issues will also need to be worked out in details - a big problem.

Electronic mail will use X.400 only. Addressing is a problem, as national authorities often do not exist. It is envisaged that information centres for operators (not users) will be needed - probably 2 in Europe. They will deal with PRMD interconnection issues.

The gateway to the US will involve protocol conversion - it should look like another ADMD to COSINE users.

To solve the many issues involved, various projects are being set up. These must run on a professional basis. They will include:

- o Directory Services - vital and high-risk, so difficult to provide commercially;
- o Information Services;
- o US gateway extensions (file transfer and terminal access);
- o user group support;
- o existing user migration;
- o security.

The Directory Services project will revolve around the problem of scale. 4-20 sites are envisaged and PTT involvement is desirable.

Information Services will be about OSI availability (catalogues, hand-books etc) and services available. About 8-20 centres are envisaged.

The US gateway expansion will deal with the philosophical problems of delineating the boundary between e-mail and bulk data transfer - should data be transferred over mail etc? Terminal access methods will also be studied - full screen or line at a time etc?

User Group support will identify new user communities, find out their needs and then pilot suitable services. Migration of existing communities (with existing solutions) will also be necessary. EARN, DECNET, SUN, EUNET users are regarded as being in this category. About 5 projects in migration are envisaged.

Security will be important. The issues are:

- o privacy;
- o reliability;
- o authentication;
- o integrity of data;
- o denial of service.

A threat analysis will be carried out and recommendations made. This is regarded as a very difficult problem, and a study only is being made at present.

There is no specific bulk-data transfer project. This is buried in the mail activities. These are store-and-forward - a FTAM approach may need to be developed.

Other possible activities are:

- development of tools and techniques for OSI;
- pilot implementations and demonstrations (eg FTAM commercial products);
- LAN/WAN interworking;
- pilot procurement (how does a non-expert procure OSI products?);
- future facilities eg OSI over ISDN, JTM, and high-speed networking.

4. COMPUTER NETWORKING REQUIREMENTS FOR EUROPEAN COMMUNITY RESEARCH PROGRAMMES

4.1 Horst Huenke, CEC, Brussels

The FRAMEWORK programme over the period 1987-91 will consume ca 6.3 billion ECU and involve 25,000 people. It is now being reviewed (a new Vice President was installed in January 1989) and may well increase.

The CEC has been active in the support of networking in various guises since 1973. In ESPRIT 1 it was fairly vague - 'improving the quality of communications between researchers'.

The RACE programme is however much more goal-oriented. Some synergy is expected here with COSINE.

The CEC Policy requires:

- o fostering of synergy amongst researchers;
- o dissemination of information;
- o reinforcement of industrial fabric;
- o fostering of standards (for the usual economic reasons).

This policy leads to the need for the sort of services being planned by COSINE. There will also be a need for high-performance links between a limited number of participants.

A final thought - when the review board asked ESPRIT users what their favourite methods of communication were, electronic mail came bottom of the list! Clearly there is a need to create a cultural framework as well as the electronic one.

4.2 A Endrizzi, CEC Joint Research Centre, Ispra, Italy

There is a need to educate potential users into the facilities COSINE could provide. Besides 'direct action', DG XII has established a Joint Research Centre. This has locations in Ispra (I), Karlsruhe (FRG), Petten (NL), Geel (B) and headquarters in Brussels. Therefore there is a desperate need for Pan-European communications. Currently they are running a private X.25 network internally, but external communications are difficult (eg the Italian PTT could only provide ISPRA with two 9.6 kbit lines to the outside world!).

An example of JRC support is ERCOFTAC (European Research Community Facility for Turbulence and Combustion). This is highly distributed with many pilot sites, and industrial organisations working in collaboration with each. AERE Harwell is a UK pilot site.

ERCOFTAC projects will probably need 2 Mbit links. Many industrials in (eg) the Aeronautics domain collaborate internationally with each other and with academic research sites, and this sort of bandwidth is needed. Security is not an issue: two networks are run, one for internal use and one for collaboration. Data is physically transferred between these as required.

A growing trend is to use powerful workstations in conjunction with supercomputers to compute and then visualise the results. Currently this is done locally, but it is envisaged that this will need to be done across Europe. A current example is a project to design a fusion reactor. This is being designed in Germany, with ISPRA responsible for the design of the maintenance robotics etc. When the German designers change something the ISPRA CAE people need to alter their own designs. Currently this happens by information transfer over the PDN, and this is too slow.

4.3 EBIT (Mr Wattain, Belgian PTT)

EBIT stands for the 'European Broad Band Integration Trial'. It is not part of RACE, though allied with its aims. There are applications pilots in 14 countries. A 2 Mbit broadband service is to be set up amongst these. The Memorandum of Understanding has been signed and is in effect until 1992 (end of RACE Phase 1). EBIT should continue after. Currently only pilot applications are considered.

Currently the service is point-to-point user circuit-switched at 1920 kbit. Two interfaces are offered, X.21 and G.703. Operator-switching is envisaged later.

5. PLANS FOR COSINE USER SUPPORT (Klaus Ullman, President of RARE)

RARE has the responsibility for running COSINE as a project.

Currently there are a number of national and Pan European networks. Each of these has its own user base, funding body etc, as well as service providers. The manufacturers of end systems are also part of the picture - mainly US based. Finally, it is always necessary to deal with PTTs. This gives interesting dynamics in the management of any project such as COSINE. Changing technology (eg better bandwidth), new technologies (such as video data display on workstations) always need to be taken into account by the service providers. The regulatory situation in Europe also changes rapidly - the CEC is pushing for liberalisation for example.

COSINE is a funding body that represents its users' interests in this environment. An example is e-mail provision. A study of e-mail gateways to the US has revealed 10-15 within Europe and an economic mess. COSINE hopes to rationalise this, at least in the X.400 domain. Invisibility to the end user is the aim.

Another problem area is the community that does not yet use e-mail. Techniques for connecting them to X.400 need to be worked out. This will involve an X.25 connection from the user's site to suitable national relays, with international relays as necessary. A structure is needed whereby potential user communities can find a form for discussion of their needs. The COSINE Policy Group hopes to set this up within the next 6 months - in the meantime contact a RARE officer.

6. THE IXI PROJECT (Christian Michau, RARE IXI Project Team)

IXI will be a connection service between research networks and public networks. Important points are:

- o it must be managed and reliable;
- o 64 kbit per access point with increase to 2 Mbit where needed;
- o a 'one stop' shopping service for customers.

IXI will connect networks by the use of PSPDN services. The 'access point' is that between the backbone and the national network. Usually there will be 2 per country - one to the PDN and one to the research network. The management of the access point will include responsibility for dissemination of the service to the end users.

Initially 2 switches will be set up - in Amsterdam and Bern. Connection to PDNs is possible to many but not all countries - Italy was a notable exception. There is a happier picture with connection to research networks.

IXI will be funded by COSINE during the COSINE project (ie free to users). Future charging and accounting has to be worked out during this period. IXI will be the basic service over which services like e-mail will be run.

A pilot service of 12 months' duration will be set up first. This is hoped for by the end of 1989 (agreements are now on the point of signature). The pilot will evaluate the service provided. It will lead to the establishment of the full service between all countries.

Each country will have a representative in IXI. They will be responsible for service access, and will identify the applications to be run over IXI. Selection of country representatives will be via RARE.

IXI will be provided by the Dutch PTT as a service. It will have its own, recognised, DNIC.

To apply to use IXI's facilities contact a RARE member.

7. NETWORKING REQUIREMENTS OF THE EUROPEAN MARINE COMMUNITY (D Schaap, MARIS, The Netherlands)

This community consists of government agencies, scientific centres, and a range of companies (involved in research and exploitation). These organisations 'deal' with all the European seas, from the Baltic to the Mediterranean. Interests include climate changes and their effects, effects of pollution, and conflicts of usage of the environment.

The needs of the scientific community include the need to access archived data quickly, and to handle large amounts of real-time data. The problems are that there is little co-ordination and communication, bad accessibility to data (eg it is known that last year 20,000 measurements were made on North Sea pollution - only 2,000 were accessible when an attempt was made to retrieve them).

Technically, resolving these problems requires good e-mail, plus the ability to exchange graphics and images (remote sensing from satellite is now important). This should give immediate access, regular updates to information, and linking with other networks.

It is believed that data should be stored locally and exchanged by networks. In this way the data is kept at its centre of expertise.

A feasibility study has been done under the MAST programme for an international 'European Infrastructure for Marine Data and Information' (EURO-MARES). The architecture proposed is one of information sources distributed and linked by communication networks. The sources would include directories, basic data, processed data, such as maps etc. Expansion of existing national organisations is envisaged to achieve this.

Besides the need for standards for Data Transfer, there is a need for quality control on the data, to protect the database.

The network for this will require e-mail, bulk data transfer (numerical and graphical), and the usual user-friendliness. There is also a need for gateways to commercial networks.

8. A TELEMATIC SERVICE FOR THE MINISTRY OF RESEARCH & TECHNOLOGY
(M Choukroun, Ministry of Research & Technology, Paris)

This service runs over MINITEL and is a who's who for the French scientific community - names of researchers, plus their interests, research activities etc. It also contains a Directory of what CEC etc programmes are underway with brief details. It also provides a news service, reporting on recent meetings etc.

The main problem is getting rapid electronic communication with institutions in Brussels etc - preferably in real-time. MINITEL capacity is precious and cannot be wasted on out-of-date information. There is also a need to provide researchers with the ability to communicate with researchers, databases etc in other countries.

9. EXCHANGE OF INFORMATION ON RESEARCH PROJECTS
(I Vannini Pureati, CNR, Milan)

CNR is involved in the organisation of ca 10,000 projects in any year at 300 institutions. It covers all scientific disciplines. There are a series of strategic 'target' projects usually of 7 years' duration. CNR consumes ca 20% of the public R&D budget.

A database of these projects is maintained, both in Italian and English. There is also a profile of each institute (research reports published, current research activities etc). It can be used to identify experts in particular fields. The database contains text only.

Access to the database is interactive via a national network. Batch enquiry is also possible from outside Italy.

In 1987 the President of CNR proposed to other Research Council Presidents extending the database internationally. It was decided to concentrate on current activities only, and to make it open to the whole scientific community.

There will be one node per country. Brief information on all projects will be cached at each node - full details of a project of interest to a user in the country will then be sent from the relevant full database. The system currently runs over EARN e-mail, but could run over other networks.

Future service requirements might include multi-media documents and language translation both for queries and for retrieved documents.

10. EUROMATH - RESEARCH ENVIRONMENT FOR THE MATHEMATICIANS OF EUROPE
(Professor Chalmers, University of Sussex)

The National Mathematic Societies support a European forum which set up a database Working party. This Working Party went over the top and recommended the setting up of the European Mathematical Trust. The EUROMATH project is its only project so far.

EUROMATH will provide information retrieval, document preparation, interpersonal communication, and possibly other facilities such as symbolic computation. It revolves around the concept of a document and its manipulation. It is intended to give a 'near' WYSIWYG user interface to documents, and translation to external representations (eg to TeX). There are the predictable problems of richness of character set involved, and of decent layout. It is also important to be able to transmit the semantics of the text eg is a numeric superscript a reference to a footnote or raising to a power in a mathematical expression?

EUROMATH will also provide a database of mathematical 'facts', preprints, a bulletin board, directories, and an e-mail front end. It aims to provide a suitable user environment for the mathematician.

The first phase included a user requirements survey (done professionally). The second phase concentrates on basic functions plus a documentation preparation and delivery system. This should finish by 1991. The third phase concentrates on selling the system to mathematicians. There will be demonstrator projects as part of this.

The network requirements are simple - functional X.400 will suffice. It is expected to encompass 500 institutes and 10,000 users.

11. NETWORKING REQUIREMENTS OF LIBRARIANS (J MacColl, University of Glasgow)

Project JUPITER is a UK project for library information transfer education and research. Activities include seminars, training courses, promotional activities, plus a survey of the use of JANET in the provision of library services.

The networked services planned include:

- o access to remote online catalogues;
- o interlending;
- o access to remote databases;
- o file transfer to bibliographic records;
- o interfaces with booksellers;
- o access to specialist services;
- o general e-mail and bulletin boards.

The availability of online catalogues (currently there are 41 available on JANET) will offer a significant enhancement of service. This depends on catalogues being brought up-to-date - on average they contain only 50% of the stock held at the library. It will be possible to couple this with interlibrary loans, plus the delivery of reports etc by fax.

It is believed that all these services will easily scale into a European environment, with obvious advantages to the user.

E-mail is used for document delivery, plus professional communications (plus, unfortunately the easy transmission of a glut of questionnaires!).

12. THE DRAFT ACTION PLAN FOR LIBRARIES (A Iljon, CEC, Luxembourg)

In 1985 a Council Resolution declared that there should be better and more cost-effective of library resources across the community. A Plan of Action has evolved from this: the potential budget is between 30-100 MECU (the exact amount depends on fighting M Thatcher!).

One of the lines of action is to link libraries internationally. Unfortunately doing this is harder than it proved to be in the UK alone. Most systems are either turn-key (often US produced), with a sprinkling of home-grown systems. OSI will be important in defining a common environment. There has been only limited input of library requirements at the Applications level to European OSI forums.

Preparation is now starting. A definition of requirements for interworking is being launched. A pilot project involving 3 consortia (in the UK, France and Netherlands) is being set up. It will deal with ILL's and use a Standard which is at ISO DP level at present. Suitable functional standards are also required.

Progress has been slow, partly because nobody is sure under which Ministry each country's libraries fall. It is hoped that a decision will be made in 1990, with work starting in 1991.

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