Esprit

European Strategic Programme
for Research and Development in
Information Technology

The Project Synopses

Office and Business Systems

Volume 5 of a series of 8

September 1989

Directorate General XIII
Telecommunications, Information Industries and Innovation
Commission of the European Communities

The Project Synopses

Office and Business Systems

Volume 5 of a series of 8

September 1989

XIII/321/89

LEGEND

EC Member States

B	Belgium
D	Federal Republic of Germany
DK	Denmark
E	Spain
F	France
GR	Greece
I	Italy
IRL	Ireland
L	Luxembourg
NL	The Netherlands
P	Portugal
UK	United Kingdom

EFTA Member States

A	Austria
CH	Switzerland
ISL	Iceland
N	Norway
S	Sweden
SF	Finland

Roles

M	Main or Coordinating Contractor
P	Partner
S	Sub-Contractor
A	Associate Contractor

INDEX BY PROJECT NUMBER

INDEX BY ACRONYM

Projects without acronym can be found in the main index

OFFICE AND BUSINESS SYSTEMS

INTRODUCTION

The world market for office and business systems is estimated to be around 240 billion ECU by the early 1990s. More than one in three (36%) of white collar workers already use a personal computer or workstation, and this figure will rise to almost one in every two (45%) by 1991, and more than that (52%) by 1993. These machines will increasingly be networked. Local area networks are currently growing at around 20 to 25% per year, 20 to 50% of them will be interconnected within a few years, and there is increasing demand for high-bandwidth (2 Megabits per second) links to support workstation interconnection and services such as high-speed fax, remote database access, videoconferencing and videotelephony.

Improvements to the user interface, and standardisation at the applications level as well as at the lower levels, will facilitate use of these systems by a broader range of people for a broader range of functions, reducing the need for training, and improving end-user productivity.

The growth in office and business systems could more than double the productivity of management and other office workers by the end of the 1990s, and affect businesses and administrations accounting for more than 50% of the Gross Domestic Product in industrialised countries.

In addition, IT systems will increasingly find their way into the home, a market which represents some 110 million households in Europe alone.

Office and business systems, and the emerging applications in the home, represent a major route for the exploitation of R&D on basic technologies in the microelectronics, information processing, and other areas. In the world of the 1990s, they represent an essential bridge between the technologies and their application.

MAIN WORK IN HAND

39 projects (about 3000 person-years of effort) are in hand under ESPRIT II, complementing the 48 projects launched under ESPRIT I.

The overall strategic aim of the work currently in hand is to take advantage of emerging opportunities in office and business systems by facilitating the application of new technologies from the microelectronics, communications and information-processing domains. The work covers integrated office and business applications, as well as their underlying enabling technologies and communications environments. In addition, in recognition of the growing importance of systems designed for application in the home, work is currently underway on the formulation of communications and control standards which will allow the development of multi-vendor and multi-applications products for private

homes. The aim here is to facilitate the uptake of IT in consumer products and, in the longer term, to facilitate the emergence of "intelligent buildings".

The development of effective integrated office and business systems requires appropriate architectures and software tools, covering a wide range of domains and a broad range of functions from document handling through to decision support. Illustrative of this work is the development of the "Office Document Architecture (ODA)" (eg. Project 1024), which provides standards for the exchange of documents and which has been widely adopted by the IT industry within and beyond ESPRIT.

Successful integration of complex application systems into the day-to-day operation of a user organisation requires methodologies and tools which both enhance productivity and at the same time help to match the systems being developed to the real business needs of the organisation concerned. Work on these aspects of the problem is illustrated by the projects on an "Intelligent Business Support System" (IBASS) (Project 1573), on "Tools for Designing Office Systems (TODOS)" (Project 813), and, focusing on the needs of public administrations, on "Advanced and Integrated Office Systems Prototypes for European Public Administrations (ASTRA)" (Project 831).

In regard to specific technologies, a key point of focus has been the work on workstations and information servers. The workstation is playing an increasing role in office and business systems, and a concerted R&D effort is needed if the European IT industry is to gain ground on the lead taken by the US and the effort which is now being put into this area by Japan. Current work here is aimed at laying the foundations for later developments which can help to put the European IT industry into a competitive position. Work has focused on developing solutions to the problems of security, handling of multimedia documents, application of artificial intelligence, effective interfacing with the paper-based systems of current environments, design of the user interface, and other fundamental problems that need to be tackled before advanced workstations can be built. Projects such as MULTIWORKS (Project 2105), SPIRIT (Project 2484) and EWS (Project 2569), among others, are developing prototypes which will demonstrate many of the technologies that are needed. It will be important in the next stage of R&D to build upon this foundation work in order to help the industry move a step further towards a competitive position in this highly dynamic and increasingly important market sector.

With the rapid growth in the number of personal computers, and now with workstations and advanced information servers, organisations are increasingly interested in networking as a way of utilising these machines to maximum advantage, linking them into larger systems, and exploiting the possibilitites they open up for resource-sharing, communications, and support of team-work at departmental, divisional and other organisational levels, including the support of enterprise-wide functions. The increasing loads put on business networks will require higher bandwidth, such as can be achieved using optical technologies, and illustrated in the work on a "Local Integrated Optical Network (LION)" (Project

169). Organisations to date have concentrated on setting up relatively small networks for particular purposes, but are increasingly interested in linking these together, and building upon them to develop much larger networks supporting multi-media communication for a wider variety of business needs. The need for effective interworking between different networks covering a broad site is being addressed by work on a "Broad Site Local Wideband Communication System (BWN)" (Project 73).

Effective use of larger and more complex networks will increasingly depend upon distributed systems which can draw on the resources of different kinds of machines (eg. micros, minis, mainframes) as and when required. In such systems, a single application may make use of several different programs held on different machines, and data spread over yet further machines, different aspects of the work being done concurrently. Important progress in tackling this problem has been made in several projects, including the work on methods and tools for the "COnstruction and MANagement of Distributed Office Systems (COMANDOS)" (Project 834). This work has made contributions to the OSF (Open Software Foundation) Programme, to ISO (International Standards Organisation) standards, and to ODP (Open Distributed Processing) standards. It will be important for the next stage of R&D to build upon these achievements.

In the projects indicated above, and in the many other projects which have made complementary or supporting contributions, fundamental problems of applying the basic technologies involved to office and business applications have been tackled and important foundations have been laid for the next stage of R&D. This next stage must build upon the achievement so far, focusing in particular on integrating the results from different areas in order to help build more complete systems that can be applied to the needs of modern business and other enterprises.

PRIORITIES FOR FUTURE WORK

The next phase of R&D in Office and Business Systems needs to take account of the market and technological changes which have been occurring over the last five years, and to concentrate on those market and technology "hot spots" where focused R&D can have maximum effect. Three major areas of "hot spots" can be identified: workstations, communications and networks, and integrated applications.

The market for workstations is currently growing at around 60% per year (compared with less than 5% per year for mainframes, and similarly low growth for other mature market segments), making it one of the most significant areas of growth, and reflecting a restructuring of the computer market. The dynamic characteristic of this market comes from a combination of two main factors: users are demanding more, and technological developments (for example, in hardware components and operating systems) are making it possible to deliver more at a competitive price. As a result, the traditional distinctions between personal computers, workstations, and minicomputers are breaking down as users are

increasingly demanding from their desktop computers what was previously only associated with workstations, and as the workstations now coming on to the market start to take on many of the characteristics previously associated only with minicomputers. Significant changes have occurred over the last two or three years, and even more significant developments can be expected in the next generation.

Along with increasing power, more sophisticated user interfaces, and other developments to the stand-alone desktop machine, a second key trend has emerged: the movement away from stand-alone machines towards the use of machines which are networked together to provide communications within and between departments and other organisational entities, facilitating the sharing of resources on the networks and supporting concurrent distributed processing. This has put increasing pressure on conventional networks, and is encouraging the development of more sophisticated networks which are faster, have better security, and are significantly more advanced in other respects than the networks of today. Again, the pressure comes from user demands combined with technological developments (for example, in high-speed transmission media such as optical fibre) which make it possible to meet those demands in ways that are economically viable.

As interest in networking has developed, so there has been increasing awareness of the possibilities for using office and business systems to support not only the work of individual users, but of people working together in teams, including people who are currently mobile or who could become so given proper technological support. User organisations are increasingly demanding systems which can support the work of whole departments or divisions within an organisation, and to support functions which span the whole enterprise.

These three trends provide a framework within which the following priorities can be identified.

There is increasingly a need for a systems approach. In particular, workstations and communications need to be considered together as part of an overall networked system designed to support the working together of people and organisational units within an enterprise. Links to public networks providing communications between different enterprises, and between widely separated units within a single enterprise, need to be provided for.

There is a need for integration throughout the system. There needs to be increasing degrees of compatibility between applications software, operating system software, and the underlying hardware infrastructure, so that applications can run smoothly on different machines in different parts of an enterprise. There also needs to be increasing degrees of compatibility between the different components of the networks supporting the enterprise, so that information can be easily transferred, processed on different machines, and printed as and when required from different printers. Mobile workers need to be integrated into the overall system so that they can access the resources of the network as easily as

people working from fixed locations. It must be possible to "retrofit" new networks to existing systems without having to scrap the vast amounts of hardware and software in which many organisations have already invested, and it needs to be possible to allow a network to grow without major redesign.

There need to be international standards so that global enterprises and enterprises moving into new parts of the world can maintain a coherent and consistent approach to their office and business systems, without having to solve problems of incompatibility between different standards in different countries. Standardisation also facilitates the interworking of products from different vendors, allowing customers a choice of vendors. This is especially important in Europe, where there is a rich variety of vendors who in combination, but not individually, offer products across the whole range of user needs. Reliance on proprietory standards would mean that customers could not satisfy the whole range of their needs by using European products unless they were prepared to develop ad hoc solutions to the interworking and compatibility problems involved. Standardisation means that customers can "mix and match" products from different vendors according to their particular needs, confident that the products will work together smoothly as components in a higher-level system.

Against this background, the following specific topics are seen to be especially important.

R&D on workstations needs to focus on the three kinds of workstation which currently set the scene for the next generation. These are: at the high end, the technical and scientific workstation; at the low end, an entry-level workstation for use in the home and in education; and, in response to the increasing demand for technology to support mobile working, the mobile workstation, with its special requirements in terms of communications, ergonomics, and other aspects.

Work on communications and networks needs to look at the critical issues which are emerging in regard to speed, security and other factors in evolving networks, especially networks designed for large areas.

The successful integration of developments in these areas into integrated applications that can serve the business needs of enterprises requires R&D across a number of topics, including the development of architectures, methods and tools, as well as specific techniques and implementations. Work is needed at a number of levels, from support for cooperative teamwork in a distributed environment, through support for particular organisational functions such as data processing, through to support for enterprise-wide applications, and integrated applications in non-business contexts (especially the home).

ESPRIT I PROJECTS

A MULTIMEDIA FILING SYSTEM (MULTOS)

PROJECT NUMBER: 28

MULTOS, a five-year project, aims at the development of a system to be used in an office environment for the efficient filing and retrieval of multimedia documents.

The system's characteristics make it suitable both for large applications, such as in public administration and banks, and for small environments.

Much of the document processing inside MULTOS is based on a document conceptual model supporting a semantic-oriented description of documents. This semantic document representation is the basis for content-oriented document processing and document-classified and content-based document retrieval.

Main project objectives are:

- development of an efficient and cost-effective system for the filing and retrieval of multimedia documents
- integration of optical storage media for filing large amounts of documents
- implementation of techniques for the content-based retrieval of text and attribute data and the investigation of techniques for the content retrieval of image data
- investigation and implementation of knowledge-based techniques for automatic document classification
- implementation of document management functions such as access control, security, integrity and version support
- definition of a multimedia document model to be used for document filing and retrieval
- development of an application environment to test and evaluate the Multos system's capabilities.

The MULTOS system is based on a Client/Server architecture. The user interacts with the system through the Client subsystem, which provides a friendly user interface for document preparation, document acquisition (from scanner and e-mail), query formulation, document display and print. The requests are issued to the Server. There are two types of document servers, related to two groups of documents with different retrieval requirements. In the dynamic server, the documents can be updated and frequently accessed, while in the archive server, the documents are stable and less frequently accessed. Document filing is done, in the dynamic server, by using magnetic storage, and in the archive server by integrating magnetic and WORM optical disks.

MULTOS uses a multimedia document model for the document representation. The European standard for an Office Document Architecture (ODA) has been adopted as the document interchange format (ODIF). The ODA model has also been extended by providing conceptual description features more suitable for efficient retrieval by content.

Documents are retrieved by searching for words in the text, or for the presence of the value of attributes and images.

A first prototype was implemented in 1987 and demonstrated at ECW '87. It provides the dynamic and archive filing (integrating WORM optical disks) for documents containing only text components. It has been implemented in the C language and consists of more than 50 000 lines of code. The prototype server runs on Sun 3 workstations with the UNIX 4.2BSD operating system, LSX 3020 minicomputers (Olivetti) with Unix V, and M380-XP5 (Olivetti) with Xenix V. An intermediate prototype that allows the storage and retrieval of multimedia documents is actually available and was demonstrated at ECW '88, while the final prototype is planned for the end of 1989. A separate classification subsystem has also been developed for automatic document classification of scanned or existing documents, while two image retrieval prototypes have been demonstrated for incorporation in the final prototype.

The development of a pilot application on top of the first Multos prototype is in progress. The application is based on patent office and newspaper office scenarios.

The consortium is in the process of producing a book on the project, published by North-Holland, covering the major aspects and achievements so far.

Contact Point

Mr. P. Savino
OLIVETTI
Via Palestro, 30
I - 56100 PISA

Tel: +39/50-500211
Tlx: 574697
Fax: +39/50-501534

Participants	**Country**	**Role**
OLIVETTI	*I*	*M*
BATTELLE INSTITUT	*D*	*P*
CRETAN COMPUTER INSTITUTE	*GR*	*P*
TRIUMPH-ADLER A.G.	*D*	*P*
EPSILON SYSTEMS & SOFTWARE CO.LTD	*GR*	*P*
ERIA S.A.	*E*	*P*
CNR-IEI	*I*	*P*

Start Date: 01-FEB-85

Duration: 60 months

STANDARDISATION OF INTEGRATED LAN SERVICES AND SERVICE ACCESS PROTOCOLS (E-INTERFACE)

PROJECT NUMBER: 43

The objective of the project is to define the services to be provided by an integrated traffic LAN and to define a stable interface between terminals (DTE: Data Terminal Equipment) and a LAN access unit. This interface will comprise the physical interface and the service access protocols by means of which the services can be used. The definition of service parameters, events, etc., will be presented for standardisation to ECMA and IEEE.

After having analysed several possible types of standard interfaces (parallel, serial, and computer-bus), the project is now focusing its effort on the external, serial-link E-interface, which is seen as the most competitive and the most likely to become a standard.

The final specification of this interface has already been produced and validated and has been submitted to ECMA for approval in January 1987. The E-interface is currently being implemented. On the basis of the established standard, it is possible to connect DTEs of different type and manufacturers to LANs of different type and manufacturers, independent of the structure and media used. The large potential LAN and terminal market development depends heavily on the existence of such a recognised standard.

Contact Point

Mr. J. Van Egmond
PHILIPS INTERNATIONAL BV
Building KOA 1
Postbus 32
NL - 1200 JD HILVERSUM

Tel: +31/35-892052
Tlx: 43712
Fax: +31/35-891267

Participants	**Country**	**Role**
PHILIPS INTERNATIONAL BV	*NL*	*M*
BRITISH TELECOM PLC	*UK*	*P*
CSELT S.P.A.	*I*	*P*
NIXDORF COMPUTER A.G.	*D*	*P*
PLESSEY COMPANY PLC	*UK*	*P*
TITN	*F*	*P*
SESA	*F*	*P*
OCE-NEDERLAND B.V.	*NL*	*P*
GEC RESEARCH LABORATORIES.	*UK*	*P*
BULL S.A.	*F*	*P*
RESEAUX COMMUNICATION ENTREP.	*F*	*S*
UNIVERSITEIT VAN TWENTE	*NL*	*S*

Start Date: 01-SEP-84

Duration: 37 months

FUNCTIONAL ANALYSIS OF OFFICE REQUIREMENTS (FAOR)

PROJECT NUMBER: 56

The FAOR project aimed to develop a methodology, to be applied in an organisational setting, to identify and evaluate the requirements which determine the design of office systems, in such a way that they achieve certain organisational objectives. The main objectives were:

- The development and validation of a methodology for understanding a client's objectives in improving the operation of his office.

- The application of the methodology, adapted for each client study, based on an understanding of the client's objectives and used to assist the client in understanding his task.

- Determination of the client's IT requirements, in order to improve his ability to meet his objectives.

- The development of a cost-benefit analysis method able to clearly and concisely demonstrate both the tangible and intangible costs and benefits to clients of alternative IT options (this is an integral part of the methodology).

- The development of a generic model of the office together with a means of tailoring the model so as to reflect specific office categories. In the pre-analysis phase this helped synthesise a tailored version of the generic methodology.

- To define a formal approach to multi-client surveys. This involved the determination of mechanisms for abstracting from a number of client studies a generic (or multi-client) view of IT requirements. These requirements could be used to plan research and development for future IT products. The product planning did not, however, form part of the FAOR project.

FAOR has drawn together several different methodological and modelling components to form a comprehensive approach to the analysis of IT requirements This is structured around a loosely procedural framework of analytical activities called the Activity Framework. The main activities are: office exploration, method tailoring and requirements analysis and evaluation. FAOR employs the Soft System Methodology (SSM) developed by Peter Checkland as a general framework for coordinating the analytical activities and as a conceptual basis for determining requirements for changing the office organisation.

The Generic Office Frame of Reference (GOFOR) supported by a library of perspectives has been developed. This will make it easier to understand the different office perspectives (information/ function/ task/ communication/ resource/ time and personnel) and assist in the client-specific tailoring of models and methodologies. GOFOR contains the reference base of office knowledge structured as multiple perspectives and formally described with the aid of Petri-

Nets. Various instruments provide tools, techniques and applications guidelines for the practical application of the multiple perspectives in a client investigation.

A benefits analysis framework has been produced which supports the evaluation of requirements and changes represented by a proposed office system. Practical evaluation of the developed methodology has been aided by carrying out a field study at Essex County Council in England.

A comprehensive final report covering the whole FAOR approach and including extensive application guidelines has been published as a book.

The openness of the FAOR Activity Framework to the incorporation of further office perspectives and other instruments offers an approach to office analysis which may yet evolve in the future.

Contact Point

Mr. H. Smith
STC TECHNOLOGY LTD
London Road
UK - HARLOW CM17 9NA, ESSEX

Tel: +44/279-29531
Tlx: 81151
Fax: +44/279-29531 x698

Participants	**Country**	**Role**
STC TECHNOLOGY LTD	*UK*	*M*
BIFOA/UNIV.KOELN	*D*	*P*
GMD-GES.F.MATHEMATIK&DATENVER.	*D*	*P*
EAST ASIATIC COMPANY LTD.	*DK*	*P*

Start Date: 01-SEP-84

Duration: 34 months

NEW INFORMATION MODELS FOR OFFICE FILING AND RETRIEVAL (MINSTREL)

PROJECT NUMBER: 59

The MINSTREL project (Models for INformation STorage and REtrievaL) identifies and developed software techniques for future office filing and retrieval systems. The focal point was the development of an office information model which could be used to describe the properties of and operations used on all forms of office information.

In MINSTREL, the existence of a large and varied body of information is assumed. This is composed of images, sound, graphics, text and numerical data. There will also be a demand for greater functionality and a higher degree of integration of computerised office support tools. Consequently, future office systems must be built with a more flexible and powerful architecture. The chosen architecture was based on three major principles: modularisation, layering of functions and a single uniform data representation.

The central task was the development of the office information model which could provide a single uniform data representation, and thus play a role similar to a database management system. The other tasks in MINSTREL were aimed at developing techniques that improve the effectiveness with which an office worker can retrieve required information from such a filing system. The research ideas developed in the project were validated by integrating them in a prototype implementation of an office filing system, which ranges from a graphic-based user interface to efficient storage structures.

The project is now completed and the following results were achieved:

- A complete, formal specification of a comprehensive office information model.

- A prototype implementation of a subset of this office information model, including a specially developed storage management system for efficient access.

- A prototype implementation of a dialogue manager, which provides a uniform user interface to all office applications.

- The use of graphics to construct a user-friendly interface that employs various presentation forms to clearly manifest the underlying organisation and structure of the stored data.

- A formal specification and prototype of a query language that allows convenient querying of both structured data and text, and which can handle imprecision, both in query criteria and in the stored data values.

- A text retrieval algorithm which uses syntactical analysis to achieve a more accurate match of queries and documents.

- The specification of an access control system, within the office information model, which provides a pseudo-mandatory, as well as a discretionary, security policy.

- A prototype implementation of a data entry subsystem that can input paper documents using a scanner in an adaptive manner, so that it can separate images from text and recognise characters despite poor quality copies, font changes and certain other irregularities.

Some of the results, such as the graphical user-interface, the handling of imprecision, the content retrieval mechanism, the access control system and the data-entry subsystem, can be applied to present-day office information systems. Some of these will be exploited by the industrial partners. The system architecture and the office information model are very relevant for future office information systems with major requirements for multimedia data and integration of application programs. In particular, the office information model is ideally suited for representing structured documents, as in the Office Document Architecture (ODA) standard, and for integrating them into a general filing and retrieval system.

Contact Point

Mr. G. McAlpine
DANSK DATAMATIK CENTRE
Lundtoftevej 1C
DK-2800 LYNGBY

Tel: +45/2-872622
Tlx: 37805
Fax: +45/2-872217

Participants	**Country**	**Role**
NATIONAL SOFTWARE CENTRE LTD	*IRL*	*M*
DANSK DATAMATIK CENTER	*DK*	*P*
UNIVERSITY COLLEGE DUBLIN	*IRL*	*P*
GN DATA	*DK*	*S*

Start Date: 01-SEP-84

Duration: 39 months

SPEECH INTERFACE AT OFFICE WORKSTATION (SPIN)

PROJECT NUMBER: 64

The objective of the project is the development of the basic components of a comprehensive speech interface and their integration into a workstation. The components are identified as speech analysis, speech recognition, speaker verification, speech coding and decoding, and speech synthesis. For the integration of the components it is important to have an understanding of the usage of speech in human-machine communication. The quality/functionality aspects must allow the interface to be accepted by the human users. The languages covered are Italian, French and modern Greek. Speaker-independent isolated word recognition will be addressed for recognition and synthesis. The demonstrating workstation will support a multimedia dialogue with voice input/output facilities. It will be tested in a real office environment.

Progress so far consists of:

- Five state-of-the-art reports available for the ESPRIT community. These examine speech recognition, speaker adaptation, automatic speaker verification, speech coding, speech synthesis and intelligibility evaluation.

- Phonological and prosodic rules for Italian and French are defined. Report on synthesis in modern Greek.

- Quality evaluation of speech coding systems.

- Analysis of parameters relating to speaker variability; this information will support the implementation of an adaptive recogniser.

- Corpus for speaker verification.

- Speaker-independent 130-word vocabulary recogniser on a PC-compatible board.

- Specification of a speech-processing VLSI.

- Assessment of French and Italian synthesisers.

A rule compiler for a prototype speech synthesis office workstation interface, based on results of experiments and simulation tests, has been designed and tested. Starting in 1989 the results are expected to be applied to the workstation market.

Contact Point

Mr M. Brilman
CGE LABORATOIRES DE MARCOUSSIS
Route de Nozay
F - 91460 MARCOUSSIS

Tel: +33/1-64491000
Tlx: 692415
Fax: +33/1-64490694

Participants	**Country**	**Role**
CGE LABORATOIRES DE MARCOUSSIS	*F*	*M*
AEG A.G.	*D*	*P*
NIXDORF COMPUTER A.G.	*D*	*P*
OROS	*F*	*P*
CSELT S.P.A.	*I*	*P*
UNIVERSITY OF AMSTERDAM TNO	*NL*	*P*
CEA-DEIN/SIR	*F*	*P*
NAT TECHN. UNIVERSITY ATHENS	*GR*	*S*
SNS PISA	*I*	*S*
SESA	*F*	*S*

Start Date: 01-JUL-84

Duration: 60 months

BROAD SITE LOCAL WIDEBAND COMMUNICATION SYSTEM (BWN)

PROJECT NUMBER: 73

This project is concerned with the research and development of a local area wideband communication system for broad sites (BWN: Broad site local Wideband Network). The prototype system will meet the anticipated future communication requirements of large industrial, scientific and administrative organisations. The project takes into account data, text, voice and graphics communication needs, and it will provide backbone networks and gateways for heterogeneous LANs.

In general terms the objectives cover the design, implementation and prototype testing of a multimedia (data, voice, still image) high performance communications infrastructure with the following characteristics:

- data rate of 134 Mbps
- data access rate of typically 2 Mbps full duplex
- broad site coverage of typically 100 km
- interconnections to LAN's of differing topologies and access protocols
- gateways to public and satellite networks
- compatibility with existing and emerging standards of the ISO-OSI reference model.

Contact Point

Mr. J. Collard
ACEC SDT
B.P. 8
B - 6000 CHARLEROI

Tel: +32/71-442070
Tlx: 51227
Fax: +32/71-433554

Participants	**Country**	**Role**
SDT	*B*	*M*
BELL TELEPHONE MANUFACTURING CO	*B*	*P*
FRANCE CABLES ET RADIO	*F*	*P*
STOLLMANN & CO GMBH	*D*	*P*
UNIVERSITE DE LIEGE	*B*	*P*
CISI/II	*F*	*S*
NAT TECHN. UNIVERSITY ATHENS	*GR*	*S*
DNAC	*F*	*S*

Start Date: 01-SEP-84

Duration: 63 months

INTELLIGENT WORKSTATION (IWS)

PROJECT NUMBER: 82

The project aims to develop a complete system that will provide assistance to office workers. In particular, office activities will be represented (documents, organisation and procedures) and these representations will be used to provide advice on actions required. Furthermore, the required actions can be automated and subsequent actions monitored until the goal is achieved. Hardware and software aspects are concerned with application-oriented developments and the user interface. For this purpose the project is divided into six modules:

- The assembly of the hardware for the construction of the workstation. Dedicated hardware, such as filtering mechanisms developed during the first year, will be taken into account when necessary in the workstation and/or servers. The hardware will be selected from products available on the market.

- The operating system of the workstation. It will be network-oriented and ensure multitasking and synchronisation with all the necessary mechanisms for increasing the reliability of the distributed system.

- The implementation of the LISP environment and Knowledge Representation System (KRS).

- Focus on the layer of office system tools that embed office semantics.

- Concrete applications to be implemented with the office system tools.

- The user interface, which is divided into three parts: natural language processing and an author system; enhancing the user interface with multimedia features (sound and image); and defining and implementing a conceptual model of the user interface.

The project uses AI techniques to design an office system that employs both knowledge about office organisation and procedures, and the necessary tools for a natural interface with the user (natural language and multimedia).

The basic components and tools for complex applications have been successfully developed and verified. Interim versions of several prototypes, which will be issued as an integrated prototype from IWS, have already been built and demonstrated at the Hannover Fair and the Esprit Conference Week.

The workstation hardware, based on BULL Metaviseur, provides a table-top office engine with a large, fast-access memory capacity (40-190 Mbytes on 5.25" hard disk), efficient graphics and voice support, 32-bit microprocessor, Ethernet communications support and a telephone interface.

The operating system environment is UNIX-based and has efficient graphic and audio support. The intelligent environment is made up of a LE-LISP compiler with its object-oriented and virtual graphics extensions.

A set of Natural Language Processing (NLP) tools have been built for English and Dutch. A dialogue system implemented above the Knowledge Representation System (KRS) uses these tools to enable natural language query expressions on the office model with natural language answer formulations.

The Knowledge Representation System (KRS) has been tested and extended to include the fast construction of knowledge-based applications. KRS has been proved to be ideally suited for research laboratories investigating advanced knowledge-representation issues. At the same time, it can also be used as a knowledge engineering environment for the construction of complex interfaces, or for other knowledge-based tasks.

The User Interface Management System (UIMS) has been developed as a tool for assisting the easy design and reimplementation of office application user interfaces. This is related to the development of the general tool ACHILLES (A Computer-Human Interface Lexical Library and Extensible Syntax) for faster specification and generation of user interfaces for particular applications.

A complete prototype of an office workstation connected to servers through a network and based on artificial intelligence techniques is available. The results will be immediately transferable into a broad spectrum of workstations. These will be the focal point of information systems in the 1990s. Spin-offs from the IWS have already been introduced in product developments.

In the areas of specific exploitation:

Bull are developing a programmatic interface for the X400 mail system used in a multimedia server, to be launched in 1989. A graphics-oriented browsing tool derived from GSE will be used in conjunction with the server. Bull is also expanding its activities in X-windows by actively participating in X-windows development within the scope of OSF.

The ACHILLES system has been used in the large MUSE project funded by NATO, assisting the development and reimplementation of the MUSE system's highly complicated user interface. This work has been undertaken by FORTH.

OCE/KUN both participated in a national project on natural language processing called Stimuerings Project Informatica Nederland (SPIN).

A spin-off company (Knowledge Technologies CV) has been set up in Italy for the commercialization of KRS and to contribute to KRS in southern Europe.

Contact Point

Mr. M. Ader
BULL MTS
7 Rue Ampere
B.P.92
F - 91343 MASSY CEDEX

Tel: +33/1-64479090
Tlx: 690079
Fax: +33/1-64478447

Participants	**Country**	**Role**
BULL MTS	*F*	*M*
FORTH	*GR*	*P*
OCE-NEDERLAND B.V.	*NL*	*P*
VRIJE UNIVERSITEIT BRUSSEL	*B*	*P*
KATHOLIEKE UNIVERSITEIT NIJMEGEN	*NL*	*P*
INRIA	*F*	*P*

Start Date: 01-MAR-85

Duration: 48 months

HANDLING MIXED TEXT/IMAGE/VOICE DOCUMENTS BASED ON A STANDARDISED OFFICE DOCUMENT ARCHITECTURE (HERODE)

PROJECT NUMBER: 121

The project deals with the design, prototype development and demonstration of cooperative tools for the handling of mixed text/image/voice documents in future office systems. The activity is based on the Office Document Architecture (ODA). ODA supports both the logical and the layout structure of documents. The ODA document-type definition allows the tools to be adapted easily to the actual type of document. This reduces the time taken by the user carrying out routine tasks and allows automatic checking of document input.

A prototype of the Document Handler has been developed and integrated. It comprises :

- a Logical Structure Editor for creating and modifying the logical structure of a document
- a Character Content Editor for editing text
- a Geometric Content Editor for handling lines, curves and graphics
- a Photographic Content Editor for editing picture information.
- a Layout Structure Editor for the automatic update of the document layout after each editing step.

A prototype of the Common User Interface and the Document Editor Shell was developed and integrated and provides a unified functional appearance for the user when employing the different editors.

The prototype of the Automated Document Entry Tool has been integrated. It supports the function of transferring a document with text, drawings and pictures into an electronic form. The following functional modules are available: preprocessing, area segmentation, geometrics recognition and coding, and photographics recognition and coding. The prototypes were demonstrated during the 1986 and 1987 ESPRIT Conference Weeks and have been described in several public papers. The project has also had a major impact on the ECMA and ISO standardisation of ODA, and the results have been used in the PODA (1024) project.

This project, which forms a basis for the standardisation of electronic documents, has been of major importance for information systems in business and administration. It allows office documents incorporating graphics and pictures to be transferred, stored and manipulated. The transfer, storage and manipulation can be made on and between different systems, from different vendors, based on

the ODA standard. It supports the development of the market for document-based information systems, and improves the marketing potential for a large number of vendors.

Contact Point

Mr. G. Kroenert
SIEMENS AG
KD AP 312
Otto-Hahn-Ring 6
D - 8000 MUNCHEN 83

Tel: +49/89-63682102
Tlx: 521090
Fax: +49/89-63646404

Participants	**Country**	**Role**
SIEMENS AG	*D*	*M*
TITN	*F*	*P*
UNIVERSITE DE NANCY-CRIN	*F*	*S*

Start Date: 01-NOV-84

Duration: 37 months

LOCAL INTEGRATED OPTICAL NETWORK (LION)

PROJECT NUMBER: 169

This project encompasses the system definition, design, prototype development and demonstration of a high-speed local communication network based on optical technology, with an OSI-consistent protocol architecture suitable for user interfacing at different layers.

LION is a multiservice business network intended for global communications in different environments such as offices, industrial and research laboratories, universities, hospitals and manufacturing plants. Traffic sources that can access LION include any mix of terminals for speech, data, control signals, graphics and compressed video images. Each service is guaranteed the required performance.

LION is also a distributed-access protocol which implements a hybrid switching technique to provide both circuit and packet communications. The network nodes regularly monitor channel activity, and each in turn gains access, following an ordered collision-avoidance procedure. The frame structure is flexible and can efficiently host services with different bit rates.

The LION 140 Mbit/s transmission subsystem exploits optical technologies. A self-healing topology is provided, which uses a two-fibre cabling with active taps, as dictated by today's commercially available components. When a link or node goes out of service, an automatic procedure isolates the failed element, restores the network continuity and resumes operation among the remaining nodes.

Specific achievements of the project are:

- A three-node prototype network with applications (spring 1989), which show LION's ability to integrate voice, data and video communications. Each node of the prototype takes advantage of a modular structure with specific hardware and firmware, interfaces, multi-processor boards and software packages. This prototype has been produced in stages, with the demonstration of node breadboards in 1986, one assembled node with selected applications in 1987, and two cooperating nodes in 1988.

- Specific access modules to connect user terminals, such as telephones, data terminals, host computers and videoconference equipment. These modules are assembled within a LION node cabinet.

- Interworking devices (gateways) to interconnect LION with an integrated services digital network (ISDN), the Telecom 1 satellite network, and Ethernet-like LANs.

- Network management and control system, based on hierarchical functionalities provided at node level (Management Module) and global level (Network Control Centre). A Measurement Centre has been implemented to test and monitor the network performance during operation.

- Circuit integration of the transmission subsystem (based on application-specific integrated circuits (ASICs)) and a 565 Mbit/s prototype breadboard, including access control functionalities.

Contact Point

Mr. L. Luvision
CSELT S.P.A.
Via Reiss Romoli 274
I - 10148 TORINO

Tel: +39/11-216931
Tlx: 220539
Fax: +39/11-2169909

Participants	**Country**	**Role**
CSELT	*I*	*M*
ALCATEL-TITN	*F*	*P*
NKT	*DK*	*P*
BRITISH TELECOM	*UK*	*S*
TELEFONICA	*E*	*S*
UNIVERSITY OF TOULOUSE	*F*	*S*
UNIVERSITY OF PATRAS	*GR*	*S*
POLITECNICO DI MILANO	*I*	*S*
POLITICNICO DI TORINO	*I*	*S*

Start Date: 16-SEP-84

Duration: 52 months

DESIGN AND OPERATIONAL EVALUATION OF OFFICE INFORMATION SERVERS (DOEOIS)

PROJECT NUMBER: 231

The objective of the project is to design, build and evaluate a small family of working prototype Office Information Servers (OIS) capable of holding in digital electronic form representations of all office information, including what is currently committed to paper, and also the state of such activities as clerical procedures or industrial processes. Both the design and the evaluation of the OIS have been based on survey data derived directly from current office practice.

A common two-layer representation (across all implementations) has been established both for the information held in the servers and the functions needed to manipulate and manage it. At the lower layer, documents are held in an internalised version of the ODA/ODIF standard, with the descriptive terms in the profile and logical structure made visible. A semantic data model, the Fact Model, is used to represent the higher level interrelationships between the objects held in the OIS. Key to the project has been consideration of the issues involved in the handling of Office Procedures with a view to creating, activating and subsequently monitoring their progress. The functionality of the OIS has been embodied in an External Functional Interface. This is intended to be an open applications interface designed to make applications portable across any OIS conforming to its specification.

Two experimental prototype server implementations were completed and offered for evaluation while running identical applications. The results of a live evaluation of a representative sample office procedure running on the OIS and a technical inspection of the OIS functionality were encouraging. Reductions of over 50% were recorded in the time taken to execute highly structured and well-defined office tasks when compared to paper equivalents.

Contact Point

Mr. O.V.D. Evans
ICL
Lovelace Road
UK - BRACKNELL RG12 4SN, BERKS

Tel: +44/344-424842 x2486
Tlx: 22971
Fax: +44/344-424842 x2306

Participants	**Country**	**Role**
ICL	*UK*	*M*
BULL S.A.	*F*	*P*
TRINITY COLLEGE DUBLIN	*IRL*	*P*
UNIVERSITY OF STUTTGART	*D*	*S*

Start Date: 16-JAN-85

Duration: 50 months

COGNITIVE SIMULATOR FOR USER INTERFACE DESIGN

PROJECT NUMBER: 234

The objectives of the project were:

- The provision of a software package incorporating the principles of cognitive psychology that could be used by the designer of the user interface as a design aid to assess human-machine cognitive compatibility. This is called the Cognitive Design Aid (CDA).

- The provision of design guidelines derived during the development of the design aid.

- The provision of an assessment of current trends in interface technology.

CDA incorporates modules based on principles extracted from cognitive psychology. These modules handle the inputs from designer to CDA. These inputs are a description of the interface and can vary from a general to a detailed level, depending on the state of development of the design.

Interfaces which were well tested were used for validating the CDA. Their descriptions were input to the CDA, which provided cognitive compatibility indices. Human error performance was also directly measured from use of the interfaces. Four different indices were found to be strongly predictive of errors and were used in the CDA. The existing CDA is thus potentially highly useful for predicting errors. The final report also discusses possible future extensions and developments.

The CDA is supplemented with an operational description, and a report describing the psychological foundations of the project.

The "Design Guidelines" document is intended for both designers and human factors specialists requiring a comprehensive and accessible set of cognitive psychology design principles. The principles are presented with examples and areas of application, in a manner which allows the relevant research to be traced. The design principles include those on which the CDA is based, and those for which automatic assessment by a CDA is not yet possible.

The "Trends in Human-Computer Interface Technology" document describes those developments, particularly in electronic office systems, that are relevant to cognitive compatibility. This information can be used for further developments of the CDA and the next statement of design principles.

The experience gained during the project and presented in the project deliverables will have an impact on both academic and industrial practice. The power of the CDA to predict average user error for the interfaces chosen merits

further research. If this is shown to be a general result it will be of great importance for cognitive psychology and practical user-interface design.

During the development of the CDA the partners studied topics which will be highly useful to them and others in subsequent projects, for example methods for interface description and evaluation. The paper-based guidelines and the trends in technology documents are already in use by the partners in their human factors work and, like all the reports in this project, are publicly available.

A subset of the final deliverables is being prepared by the consortium for public circulation.

Contact Point

Mr. P. Byerley
ALCATEL ESC
Human Factors Technology Centre
Great Eastern House — *Tel: +44/279-35451*
Edinburgh Way — *Tlx: 817089*
UK - HARLOW CN20 2BN, ESSEX — *Fax: +44/279-30704*

Participants	**Country**	**Role**
ALCATEL ESC	*UK*	*M*
GEC RESEARCH LABORATORIES	*UK*	*P*
MEDICAL RESEARCH COUNCIL	*UK*	*P*
LOGOS PROGETTI SRL	*I*	*P*

Start Date: 01-JAN-85 — *Duration: 28 months*

COMMUNICATIONS SYSTEMS ARCHITECTURE (CSA)

PROJECT NUMBER: 237

Within the office and communications environments there is a trend towards multivendor systems with computing power distributed throughout. By its nature information and associated input/output resources are distributed on different nodes and accessed by many users from a variety of terminal devices. It is this complex pciture which motivated the project to investigate how such systems can be constructed and managed in a consistent manner. The project was convinced that major benefits could be realised if a consistent platform could be provided for application systems irrespective of whether the underlying resources were single system/single vendor, or distributed over multivendor systems.

The overall aim of the project is to specify and design an architecture that provides an environment consistent with the above objectives. In order to achieve this the following architectural requirements were identified:

- Abstraction from heterogeneity of different hardware and operating systems, thus providing portability.

- Abstraction from distribution, thus providing location-transparent communication.

- Support for communication with non-CSA systems.

The project was organised into two major phases:

- Identification of the needs for communication by analysis of user requirements, followed by development of the architectural specification (years 1 and 2).

- Development of a prototype system based on currently available technology using appropriate standards and existing communication networks, followed by demonstration of distributed applications on top of this system (years 3, 4 and 5).

The overall strategic architecture was defined in December 1986. It is based on an object-oriented approach for structuring the problems associated with the office and communications environments. The architecture provides integrated techniques for managing resources and handling communication between entities.

A prototype machine was demonstrated in September 1988 which incorporated those features required to provide abstraction from the underlying hardware and operating system of a single machine. A prototype system scheduled for December 1989 will consist of a number of machines, as described above. The prototype will demonstrate the architectural features that support abstraction from

distribution. A real distributed application will be implemented and demonstrated on the prototype system.

Contact Point

Mr. M.J. Wilson
PLESSEY RESEARCH & TECHNOLOGY — *Tel: +44/794-515222*
Roke Manor — *Tlx: 47311*
UK - ROMSEY SO51 0ZN, HANTS — *Fax: +44/794-515222 x2433*

Participants	**Country**	**Role**
PLESSEY COMPANY PLC	*UK*	*M*
MARI ADVANCED MICROELECTRONICS	*UK*	*P*
SYNERGIE INFORM. ET DEVELOPMENT	*F*	*P*
PHILIPS GMBH	*D*	*P*

Start Date: 29-OCT-84 — *Duration: 62 months*

ULTRA WIDEBAND OPTICAL COHERENT LAN (UCOL)

PROJECT NUMBER: 249

The project has investigated the feasibility of utilising coherent optical techniques for high capacity communications in a local area network.

In applying these techniques to local area networks the project has set particular emphasis on the implications of the interactions between the adopted technology, the selected transmission techniques, the statistical characteristics of the traffic, and the management configuration, in order to ensure that the outcome of the design would be an efficient system. The network concept developed within the project provides a total capacity of several Gb/s. All types of service are supported, and its geographical range exceeds that of conventional LANs.

Binary PSK was selected because it needs the lowest optical signal power for a given error probability. Differential PSK was adopted because it avoids the need for complex circuitry for carrier recovery. The constraints placed upon the receiver response time when operated within a multichannel, multi-user environment are severe if network efficiency is not to be compromised. Rapid inter-message response has been a principal design objective of the project from the outset.

A laboratory demonstration of the underlying detection principle was successfully staged. The theoretical work on the system concept, and the experimental activity carried out on three of the most important building blocks (the narrowlined source, the comb generator and the receiver), indicates that the physical structure necessary to support network operation is feasible and can offer high performance.

In the project it has been demonstrated how it is possible to exploit the star configuration in a high efficiency TDM protocol which regulates access to each individual optical frequency. Time-slot division of individual optical channels permits efficient service integration; TDM on each individual optical frequency allows flexibility in bandwidth allocation and therefore agile mixing of high bandwidth and low bandwidth users. Furthermore, delay-sensitive applications can be dealt with within their time constraints. Frequency-domain switching between channels is therefore exploited essentially to obtain inexpensive adaptive network reconfiguration without hardware modifications.

The range of specific applications is extremely large. A preliminary survey has been carried out during the UCOL feasibility study to assess qualitatively its potential and the most suitable application areas. In conclusion, the study has proved that with coherent optics techniques it will be possible to build a network with a very high capacity and excellent performance in information flow handling.

Contact Point

Mr. A. Fioretti
INDUSTRY FACE STANDARD S.P.A
10 Via Nicaragua
I - 00040 POMEZIA

Tel: +39/6-912851
Tlx: 613340
Fax: +39/6-912851 x261

Participants	**Country**	**Role**
INDUSTRY FACE STANDARD SPA	*I*	*M*
POLITECNICO DI MILANO	*I*	*P*
GEC RESEARCH LABORATORIES	*UK*	*P*

Start Date: 01-FEB-85

Duration: 36 months

OFFICE SUPPORT SYSTEMS ANALYSIS AND DESIGN (OSSAD)

PROJECT NUMBER: 285

The overall aim of OSSAD is to develop, implement and validate a problem-oriented office system analysis and design methodology using a formal office language that helps users and manufacturers to specify and implement a computer-based Office Support System (OSS) and to meet the needs of end-users and organisations. More specific objectives are :

- To obtain a description of office work which is as formal and unambiguous as possible. This description should be comprehensible not only to analysts and designers but also to office managers so that they can validate it and suggest modifications and solutions.

- To relate office descriptions to relevant organization performance criteria and to help evaluate office work.

- To validate this description in real office environments by evaluating and improving it on the basis of field studies.

- To specify requirements of office support systems with respect to the user, the organization and the technical solution; these requirements will be based on empirical findings in existing offices.

Achievements:

- Development of different methods for office analysis (eg office functions analysis) based on the OSSAD model, which includes an abstract, descriptive and specification model.

- A glossary of terms to describe office work has been developed and a graphical mapping of formal office language has been specified.

- The abstract and descriptive model and the related data collection instruments have been validated in field studies in banks in France, Italy and Germany.

- An OSSAD manual is available. It consists of a description of the models and a presentation of the language and covers the whole process of reorganizing an office support system (set contract, analyze situation, design system, implement changes, monitor system performance). This manual supports the project management process and will be used to tailor data collection instruments to the needs of specific users and organizations .

- The design methodology was tested in field studies and the findings included in the final OSSAD manual and in the field test report.

The ability to derive better user requirement specifications will have a very positive impact on information system applications and on the rapid acceptance of future IT products. The developed office language "OSSADIC" can be used to specify technology/human behaviour interfaces and supports common efforts to integrate different kinds of office support systems from several European manufacturers.

Since October 1988 OSSAD has been operating in a pilot project at the Swiss Bank Society. The aim of the project is to assist the qualified office worker by supporting the potential office environment and combining the needs required by organisational changes within a coherent framework of office support tools.

Contact Point

Mr. S. Sorg
IOT
Kaestlenstrasse 32
D - 8000 MUNCHEN 82

Tel: +49/89-4302091
Tlx: 5214288
Fax: +49/89-4308741

Participants	**Country**	**Role**
IOT	*D*	*M*
CENTRE D'ETUDES DU MANAGEMENT	*F*	*P*
IST. PER AUTOMAZIONE RISPARMIO	*I*	*P*
UNIV. DEGLI STUDI DI MILANO	*I*	*S*

Start Date: 01-JAN-85

Duration: 52 months

LINGUISTIC ANALYSIS OF THE EUROPEAN LANGUAGES

PROJECT NUMBER: 291

The completed project has produced the software necessary to perform grapheme-to-phoneme and phoneme-to-grapheme conversion at word level. This involves conversions between the textual and acoustical representation of words and the acquisition of the knowledge required to include speech in the man-machine interface. A linguistic model, based on typical syntactic patterns extracted from texts by statistical analyses, has been developed to deal with ambiguous solutions. The project covers the following languages: Dutch, English, French, German, Greek, Italian and Spanish. The first step has been the development of a common methodology among the different languages in order to provide coherent and comparable results. Hardware and software tools have been standardised among the partners, and when necessary language-specific tools were developed. Reference corpora of about 200 000 words plus dictionaries and lists of ambiguities (homographs and homophones) are available. They have been extracted from common European Community texts and newspapers. The definition and development of a linguistic model for semi-automatic labelling of new text corpora and for phoneme-to-grapheme conversion on the basis of a contextual analysis has been achieved.

The following results are now available for the different languages:

Conversion Algorithm

- Word level grapheme-to-phoneme conversion algorithms

- Word level phoneme-to-grapheme conversion algorithms.

Analysis of Language at Word Level

- Computer-readable common phonemic alphabet

- Consistent systems of grammatical classes

- Labelling of text corpora of a few thousand words

- Dictionaries, extracted from the corpora, providing for each word the graphemic and phonemic representations, the possible grammatical tabs, and the usage frequency

- Statistics, extracted from the dictionaries, providing:

  phonemes and phoneme cluster frequency

  graphemes and grapheme cluster frequency

  word distribution based on the grapheme length and on the length with or without frequency weighting

  the set function K(n) providing K, the percentage coverage of the corpora obtained with the n most frequent words.

Disambiguation Rules for Phoneme to Grapheme Conversion

- List of ambiguous words and ambiguity frequency estimators regarding the grapheme to phoneme to grapheme conversions

- Transition matrices providing the observed frequency of any pair or triplet of grammatical classes.

Assessment of Conversions

- Methodologies for evaluating the statistical validity of the information appearing in the transition matrices and for comparing the expected performance in speech recognition of different class systems.

Integration in a Practical Conversion System

- A blackboard model of the language that uses the available knowledge on contextual constraints for solving the ambiguities consequent to the phoneme to grapheme conversion and for selecting the most likely sentence from a word lattice.

Full industrial exploitation of the results is expected by the end of the 1980s in speech processing based systems. Target application areas are unrestricted texts, speech synthesis, and large vocabulary speech recognition. The acquired knowledge and the results obtained will also be useful for applications to other domains, such as optical reading, word processing and automatic translation.

Contact Point

Ing. V. Vittorelli
OLIVETTI
Corso Svizzera 185
I - 10149 TORINO

Tel: +39/11-748162
Tlx: 210030
Fax: +39/11-746511

Participants	**Country**	**Role**
OLIVETTI	*I*	*M*
ACORN COMPUTERS LTD	*UK*	*P*
UNIV. NACIONAL EDUCACION DIST.	*E*	*P*
RUHR UNIVERSITAT BOCHUM	*D*	*P*
UNIVERSITY OF PATRAS	*GR*	*P*
KATHOLIEK UNIVERSITEIT NIJMEGEN	*NL*	*P*
CNRS-LIMSI	*F*	*P*

Start Date: 01-FEB-85

Duration: 50 months

THE PAPER INTERFACE (PAPER)

PROJECT NUMBER: 295

This project deals with techniques for the automatic transfer of information between electronic systems and paper documents. Three major categories of paper interface systems are identified:

From paper:

Scanning of composed paper documents. Separation into image, graphics, and text. Recognising and encoding text and graphics for further processing to generate an electronic document.

To paper:

The generation of a paper document from electronically filed information.

With paper:

Recognising and encoding typical text and graphics information in real time as it is produced.

These components will be integrated into one system, with particular emphasis on aspects such as the human interface, editing and document architectures. The project objectives include, for each task, the specification of requirements, a technology study, system and functional specifications, and the development of an algorithm.

The project has developed a broad set of subsystems. Currently under test are:

- multicolour scanner
- page printer sub-system
- graphics analyser
- image analyser
- text recognition module
- subsystem for online handwriting recognition
- document rendition software for combining and graphics

The integration of each subsystem was tested in the preliminary demonstrator. This demonstrator system is now in operation, integrating the three project components (scanner, analysis software and printer) for evaluation and demonstration. The partners are now working on the final improvements.

The results are expected to be incorporated into office products in 1990. They will contribute to establishing a link between the paperless parts of the office of the future and those areas where paper will remain an indispensable element. The provision of this link will meet the growing need to avoid incompatibility between paperless and paper-bound tasks.

Contact Point

Mr. Boes
AEG A G
Bueckelstrasse 1/5
D - 7750 KONSTANZ

Tel: +49/7531-862092
Tlx: 733233
Fax: +49/7531-862421

Participants	**Country**	**Role**
AEG A.G.	*D*	*M*
OLIVETTI	*I*	*P*
PLESSEY COMPANY LTD	*UK*	*P*
TRENT POLYTECHNIC	*UK*	*S*
PHILIPS FORSCHUNGSLABOR	*D*	*P*

Start Date: 01-SEP-84

Duration: 60 months

SECURE, OPEN, MULTIMEDIA, INTEGRATED WORKSTATION (SOMIW)

PROJECT NUMBER: 367

The aim of the SOMIW project is to build an advanced multimedia workstation for office workers. The project focuses on the following main topics :

- Communications: the user will be able to communicate through different types of network, in particular ISDN. Communication can be protected against intrusion by a cryptosystem based on public keys.

- Multimedia input/output components: different I/O components will be integrated in the workstations. These will include classical devices, like the mouse and the keyboard, and intelligent ones like an OCR (Optical Character Recognition) module, a voice recognition and synthesis component, an image processor (allowing acquisition and display of animated colour images for transmission or archiving purposes), and a voice processor for coding voice at different rates.

- User Interface Management System (UIMS): UIMS has been added to the project for managing the interaction with the user. Separating application development and user interface development allows the splitting of responsibilities. A specialist handles the difficult task of designing and implementing a dialogue structure, including the command syntax.

- Integrated applications: for preparing and handling documents, a multimedia WYSIWYG (What You See Is What You Get) editor, formatter, printer server and a filing and retrieval system will be developed. The object-oriented operating system and the user interface management system will facilitate the integration of all the software components (editor, formatter-printer server, filing, retrieval, and screen management).

A workstation design, called Metaviseur, was adopted to permit the integration of the proposed devices, thereby defining a standard reference architecture.

For the integration of software an object-oriented operating system was adopted and extended for distribution. The SOMIW Operating System (SOS) eases the final integration of the different applications and modularises the services offered by the operating system by basing them on a minimal kernel. SOS is UNIX-compatible. Window management, screen and screen management, multiplexing of video images and the integration of these different functionalities are available as services of the operating system.

The document-handling applications have been integrated into a common object-oriented document architecture offered by the filing and retrieval module. For this a common document architecture based on the ODA standard has been adopted.

A first non-integrated version of the different SOMIW components has been successfully demonstrated on several occasions, including the Hannover Fair and the Esprit Conference Week.

From the results of the project, Bull plans to develop its work in 3-D graphics and voice processing; BALZAC, a document editor, and RAPHAEL, a structured graphical editor (both spin-off products from SOMIW) will be marketed. The Metaviseur adopted in the SOMIW project will be used in the design of the DPX 1000, another Bull product.

The achievements of the screen hardware subproject (ISELQUI, I) will be used in future projects in Italy.

The UIMS know-how acquired (INESC, P), will be exploited in future developments, and UIMS itself will be used as an application development tool in ESPRIT II projects.

The network interface and the audio-video codes (CSELT, I) will be implemented in future ESPRIT II projects. The audio/video multiplexer will be integrated in a VLSI component.

The results achieved on the printer server (SOBEMAP, B), OCR interface (AEG, D), and filing and retrieval (SARIN, I) subprojects will be further developed either in industrial or ESPRIT II projects.

Contact Point

Mr. B. Servolle
BULL MTS
7 Rue Ampere
B.P. 92
F - 91343 MASSY CEDEX

Tel: +33/1-64479090
Tlx: 690079
Fax: +33/1-64478447

Participants	**Country**	**Role**
BULL MTS	*F*	*M*
AEG OLYMPIA	*D*	*P*
INESC	*P*	*P*
ITAL TELEMATICA SPA	*I*	*P*
SOBEMAP S.A.	*B*	*P*
SARIN S.P.A.	*I*	*P*
INRIA	*F*	*P*
CSELT S.P.A.	*I*	*P*
CTRE ETUDE ENERGIE NUCLEAIRE	*B*	*P*
ISELQUI	*I*	*P*

Start Date: 01-JAN-85

Duration: 48 months

HUMAN FACTORS LABORATORIES IN INFORMATION TECHNOLOGIES (HUFIT)

PROJECT NUMBER: 385

The methods and tools under development are:

- An integrated set of methods and tools for the design of easily usable software (ISMED).

- A prototype multimedia adaptable integrated interface with appropriate tools to develop it efficiently (MAITRE).

- A dialogue management tool to develop efficiently integrated graphical interfaces (DIAMANT).

- A support system for the designer to assist in the human factors oriented design of usable software (INTUIT).

The tools will exist in a variety of forms, from simple paper-based ones, to an IT-based decision support system providing advice and tools which contain a large amount of human factors knowledge. These tools are being developed with the help of designers in the companies, so that they will be practical and useful aids to such staff at their work bench.

To date, the project has achieved the following results:

- OLIWRITER, an Olivetti product, has been evaluated and improved.

- DIAMANT: a dialogue management tool for the efficient implementation of advanced integrated graphical interfaces is currently in use in seven European IT companies for rapid prototyping. Three products have been implemented so far by using this tool.

- The project has generated advances in voice interaction, direct manipulation and hybrid dialogue styles, and the development of tools for user and task analysis and usability evaluation.

- A service has been set up for the transfer of human factors knowledge to the industry.

The project strongly influences the national (DIN, BSI) and international (ISO, CEN) standard organisations in the field of usability and computer interaction. Furthermore, the industrial partners within the project are creating human factors laboratories at their sites and are sharing the resources with each other.

As the results of the research undertaken within the project to date, some of the project members have been persuaded to modify their design processes in order

to take proper account of the human factors issues, and of the need for tools for the design of the human-machine interface.

By 1990, the project's knowledge and many of its deliverables, including the human factors tools, will be made available to the ESPRIT projects and the wider European IT community.

Contact Point

Mr. K.P. Faehnrich
FRAUNHOFER IAO
Holzgartenstrasse 17
D - 7000 STUTTGART 1

Tel: +49/711-1213810
Tlx: 721978
Fax: +49/711-295769

Participants	Country	Role
FRAUNHOFER IAO	*D*	*M*
HUSAT RESEARCH CENTRE	*UK*	*P*
BULL MTS	*F*	*P*
ICL	*UK*	*P*
PHILIPS GLOEILAMPENFABRIEKEN	*NL*	*P*
SIEMENS AG	*D*	*P*
OLIVETTI	*I*	*P*
UNIVERSIDADE DO MINHO	*P*	*S*
WILHELMS UNIVERSITAT WESTFAHL.	*D*	*S*
UNIVERSITY COLLEGE CORK	*IRL*	*S*
THE PIRAEUS GRADUATE SCHOOL	*GR*	*S*

Start Date: 01-DEC-84

Duration: 60 months

AN INTEGRATED NETWORK ARCHITECTURE FOR OFFICE COMMUNICATIONS (INCA)

PROJECT NUMBER: 395

The Integrated Network Architecture for Office Communications (INCA) project began in September 1984. The principal purpose of the project was to define and design an integrated network architecture for office communication within the framework of current international standards, particularly Open Systems Interconnection (OSI). It was also intended to demonstrate aspects of the architecture with interworking implementations. The INCA architecture was intended to allow the interchange of many different representations of information (eg. text, graphics, image, voice) over a wide variety of sub-networks, while presenting to the user a single, integrated interface.

Although international standards are technically stable in many of the areas covered by INCA, there are other areas (eg. directory services and network management) where the standards are only just reaching maturity. Even in the cases where the base standards are stable, few functional profiles have been completely defined and the concept of International Standardised Profiles (ISPs) has only recently emerged. As a result, it has been necessary for the INCA project to define the required profiles and, as the international standards emerge, migrate to the appropriate standard. A significant amount of effort has been expended in feeding the results of the INCA project into various standards bodies and influencing international standards design.

Network management is an area of particular interest to INCA. It is a vital requirement for any integrated network architecture but, as yet, the standards are still being developed. The INCA partners have contributed to the development of these standards and Modcomp and UCL have undertaken some implementation work.

The project will lead to considerable commercial exploitation, either as a direct result of the project or by feeding in the results to other projects. Some of this exploitation has already taken place.

GEC's main area of interest has been in FDDI networks, and a prototype FDDI station (for use in a digital switching system) has been developed; work to develop station management software is underway. It is expected that this work will be incorporated into real projects within 12 to 18 months. On a rather longer timescale, the work on network management is likely to be included in telecommunications systems.

The work in INCA on the LAN controller has been taken as the reference for most of the Olivetti developments for both the PC and the new LSX minicomputer product lines. In the case of the latter, the INCA work on a SCSI board provided valuable experience, although the actual SCSI board developed did not become a

product. The INCA work on protocol architectures and network management has been used as the foundation for Olivetti network products.

In the case of Nixdorf, the prototype of the high resolution display developed within INCA has been further developed to become a commercial product (as part of Nixdorf's Professional Workstation). A futher (20") display is now under development. The early work on the Standard Document Editor has led to a module of the PWS-X workstation. Later work (following the transition to ODA) has been used as input to the ESPRIT PODA projects.

The Virtual Automata Processor (VAP) developed by Modcomp is available within the AEG group on proprietary hardware, but it can be modified to run in other environments such as Unix. Modcomp intend to market the Unix version initially in Europe but later worldwide. Various other tools developed under INCA (eg. the Ethernet monitor) are also likely to become commercially available.

University College London has exploited the results of INCA in a somewhat different mannner. Firstly, the results of the project are fed into teaching and into the wider research community. Secondly, there has been direct commercial exploitation by means of agreements between UCL and commercial organisations. Thirdly, the work will be used in further collaborative projects (eg. PODA-2 and PROOF).

Contact Point

Mr. M.J. Biggs
GEC RESEARCH LABORATORIES
East Lane
UK - WEMBLY HA9 7PP, MIDDLESEX

Tel: +44/1-9089000
Tlx: 923429
Fax: +44/1-9047582

Participants	**Country**	**Role**
GEC RESEARCH LABORATORIES	*UK*	*M*
ATM COMPUTER GMBH	*D*	*P*
OLIVETTI	*I*	*P*
SYSTEMS WIZARDS SRL	*I*	*S*
NIXDORF COMPUTER A.G.	*D*	*P*
UNIVERSITY COLLEGE OF LONDON	*UK*	*S*

Start Date: 01-SEP-84 *Duration: 51 months*

INVESTIGATION INTO THE EFFECTIVE USE OF SPEECH AT THE HUMAN-MACHINE INTERFACE

PROJECT NUMBER: 449

This project, which is now completed, addressed voice applications in a wide range of environments. The objectives were:

- To determine the current state of the art (hardware and software) and the current areas of actual and imminent application.

- To explore the potential for future applications.

- To determine the additional new requirements for hardware and software so that the potential application areas can be realised.

- To forecast the likely development of speech technology over the next 5 years, with specific reference to application areas.

The effective use of speech can be seen as a major enabling tool in the wider use of information technology. Yet there are conflicting reports about its successful use, and a general lack of understanding of the technology.

A comprehensive final report is publicly available, which includes a list of conclusions and recommendations. These are the most important considerations for the development of a successful system:

- Isolated word-recognition systems perform satisfactorily; connected speech is possible with good equipment and good design. Continuous speech recognition is unreliable or extremely specialised and expensive.

- There are several reliable speech synthesis systems that can be used with speech recognition systems (for example with touch-tone telephones for dial-in enquiry systems) to give a completely hands-free environment.

- Speech should be part of the overall design of a system; success is less likely when speech is added to a current package.

- Successful implementation requires more knowledge than the average potential system designer has available. The suppliers' supporting software, technical descriptions and documentation tend to be poor.

- The greatest expenses do not arise from the cost of the voice equipment but the cost of thorough system design and integration.

There were several significant findings:

- The effectiveness of an application is often governed by the appropriateness of the microphones and other ancillary equipment.

- With properly calibrated equipment, consistent high background noise (90 dBA) did not detract from recognition.

- A well-designed vocabulary on a low-quality recogniser could out-perform a badly designed vocabulary on superior equipment.

- Many of the current successful applications used small vocabularies organised into context-selected sets. Large vocabularies tend to encourage the notion that unrestricted language can be used, which is not yet possible.

The major considerations for future developments are:

- Continuous speech systems require research into and analysis of phonetic and linguistic factors and need to be implemented via knowledge-based interpretation on faster and cheaper processors. This is unlikely in the next 10 years.

- Speech synthesis applications are the most likely for early widespread development, especially by telephone companies.

- The industrial area is the most amenable to speech recognition applications with current equipment. Further exploitation in the office environment can only come from speech synthesis and with better continuous speech recognition.

- The next generation of systems will analyse and store speech based on phonemes; this will cut down storage requirements, but will result in language and dialect dependencies.

- The concept of true speaker-independent recognition, removing the need for 'enrolment' or 'voice training' for each new speaker, will be highly dependent upon the outcome of current IKBS and algorithm research and is definitely some way off.

Speech technology is already being used successfully, and provided the current limitations are observed and taken account of in the design, there are good prospects for increased use of the technology in selected and restricted situations. Unrealistic expectations of the customer and over-selling by the suppliers, coupled with poor documentation, are producing a large number of failed projects, causing prospective beneficiaries to delay their commitment. Improvements in the basic technology are continuing. Continuous speech recognition is not available commercially, but neither are the systems ideas or designs that could make effective use of it. It has become clear from limited experimentation that considerable complexity in software may be necessary to deal with even quite limited vocabularies and restricted syntax where interpretation

is called for. On the other hand, the benefits of simple speech input coupled with synthesised voice prompting have been demonstrated publicly by the project team. They have shown the benefit of totally hands-free control and the value of a well-designed, simple command syntax.

Contact Point

Mr. I.M. Tolmie
BRITISH MARITIME TECHNOLOGY
Wallsend Research Station
UK - WALLSEND NE28 6UY, TYNE & WEAR
Tel: +44/91-2625242
Tlx: 53476
Fax: +44/91-2638754

Participants	**Country**	**Role**
BRITISH MARITIME TECHNOLOGY	*UK*	*M*
FINCANTIERI	*I*	*P*
VOICE SYSTEMS INTERNATIONAL	*UK*	*P*
ICL	*UK*	*P*

Start Date: 01-JUN-85 *Duration: 13 months*

A HIGH COMPRESSION PICTURE-CODING ALGORITHM FOR PHOTOGRAPHIC VIDEOTEX (PICA)

PROJECT NUMBER: 563

The objective of the project was to produce an efficient compression scheme for photographic images. The algorithm was to be capable of compressing a colour picture to 1 bit/pel or less while retaining good quality, allowing a full-frame videotex picture to be stored in only 32 Kbytes of memory and to be transmitted in 4 seconds on the Integrated Services Digital Network (ISDN). The final goal of the project was to gain acceptance of the algorithm as a standard.

Innovative compression algorithms have been developed and tested and then compared with known ones. Good results have been achieved, with compression values meeting, and in some cases exceeding, the target of 1 bit/pel. Following the first year's work a patent application has been made on a new technique for vector quantisation by CSELT. BT has been developing a new technique, known as Recursive Binary Nesting, and a patent was filed during the second year.

PICA has submitted two compression algorithms to the ISO/CCITT Joint Photographic Experts Group (JPEG) for standardisation and one of them, the ADCT, was ranked first out of 12 during the first evaluation exercise. Early in 1988, the PICA project achieved its goal when ISO selected the PICA-ADCT algorithm for development into a standard.

Excellent results in terms of image quality have been achieved using compression ratios of 21:1, and at 16:1 the decoded image is indistinguishable from the original except to the trained eye. At 64:1 the image can still be recognised and could, for example, be used for the quick scanning of photographic archives. The agreed high compression technique should stimulate the market for photovideotex services in the late 1980s.

Contact Point

Mr. Ch. Dawkins
BRITISH TELECOM PLC
Martlesham Heath
UK - IPSWICH IP5 7RE, SUFFOLK

Tel: +44/473-643390
Tlx: 98376
Fax: +44/473-642157

Participants	**Country**	**Role**
BRITISH TELECOM PLC	*UK*	*M*
CLETT	*F*	*P*
INDEPENDENT BROADCASTING AUTH.	*UK*	*P*
NIXDORF COMPUTER A.G.	*D*	*P*
KTAS	*DK*	*P*
DR. NEHER LABORATORIES	*NL*	*P*
CSELT S.P.A.	*I*	*P*

Start Date: 01-JAN-85 *Duration: 39 months*

MODELLING AND SIMULATION OF THE VISUAL CHARACTERISTICS OF MODERN DISPLAY TECHNOLOGIES UNDER OFFICE WORK CONDITIONS

PROJECT NUMBER: 612

The project objective is to design, engineer and build a hardware device able to simulate, in real time, a broad range of flat panel displays. These include electro luminescent (EL), thin film EL, memory EL, active matrix liquid crystal (LC), ferroelectric LC and supertwisted LC. This device will be used by office automation manufacturers as well as display manufacturers, to test the properties of new technologies and to optimise the display parameters in order to obtain good image quality and maximum user acceptability.

Specific objectives are :

- Comparison between various simulated display technologies and technical solutions according to user acceptability criteria.

- Ergonomic experiments, under prolonged office work conditions, to find the relationships between technology-dependent display properties, visual discomfort and image quality.

The simulator facility will support display designers and display users (office amtomation manufacturers, user organisations, etc.) in the definition of new products and applications.

Achievements so far are:

- Top-level design of the simulation software required for real-time simulation of display technologies.

- Implementation and demonstration of a first version of an electro-luminescence display model.

- First demonstration of the simulator machine.

- Design of the high resolution digitally controlled colour monitor required to visualise the simulated displays.

- Design of a shading correction technique for CRT.

- Construction of a functional model of visual perception.

After 1989 the simulator facility will be in full operation, and will be useful in shortening the design cycle of user-acceptable displays, for both display and office automation manufacturers.

Contact Point

Mrs. Y. Placencia Porrero
OCE-NEDERLAND B.V.
St.Urbanusweg,126
P.O.Box 101
NL - 5900 MA VENLO

Tel: +31/77-592222
Tlx: 58037
Fax: +31/77-594313

Participants	**Country**	**Role**
OCE-NEDERLAND B.V.	*NL*	*M*
BARCO INDUSTRIES N.V.	*B*	*P*
GEC RESEARCH LABORATORIES	*UK*	*P*
UNIVERSITEIT VAN TWENTE	*NL*	*P*
MYFRA S.A.	*F*	*P*
CIMSA-SINTRA	*F*	*P*

Start Date: 01-OCT-84

Duration: 60 months

TOOLS FOR DESIGNING OFFICE SYSTEMS (TODOS)

PROJECT NUMBER: 813

The aim of the TODOS project is the development of tools to support office systems design. These tools will cover all phases from the planning stage to the proposal of an office systems architecture. The tools developed will be used by the system designer and will support requirements collection and analysis, logical design, the rapid prototyping of office systems to validate requirements, and architecture design.

The objectives of the work programme are:

- To investigate models for office systems design, from feasibility analysis through to implementation specification.

- To provide a design support environment, based on graphical interfaces and using expert techniques, to guide the design and to identify problems and incorrect specifications.

- To provide tools for the evaluation of the proposed office models during the different development phases.

- To provide tools for the design of the office system architecture.

- To provide tools for office prototyping based on the specification of the conceptual model.

Achievements are:

- A state of the art report has been produced on office characteristics, office models, design methodologies, design support tools and system development methodologies and environments.

- Existing multimedia data bases have been investigated.

- A TODOS conceptual model and a specification language have been specified.

- A rapid prototyping model has been developed.

- Tools have been developed for the practical proof of the researched methods and concepts.

- The results achieved in project 56(FAOR) have been developed successfully in this project.

This project has developed methodologies and support tools for office systems design which will enable the more effective and efficient introduction of IT technologies in the office.

Contact Point

Mr. W. Vogel
DORNIER GMBH
Department WF 40
Postbox 1420
D - 7990 FRIEDRICHSHAFEN 1

Tel: +49/7545-83098
Tlx: 0734209
Fax: +49/7545-84411

Participants	Country	Role
DORNIER GMBH	*D*	*M*
ITAL TELEMATRICA SPA	*I*	*P*
POLITECNICO DI MILANO	*I*	*P*
SEMA METRA	*F*	*P*
THOMSON INFORMATIQUE SERVICES	*F*	*P*
OCE-NEDERLAND B.V.	*NL*	*P*
CNR-IEI	*I*	*S*
SYSTEM AND MANAGEMENT SPA	*I*	*S*
UNIVERSITE PARIS 1 SORBONNE	*F*	*S*
BIFOA	*D*	*S*

Start Date: 01-JAN-86

Duration: 36 months

ADVANCED AND INTEGRATED OFFICE SYSTEMS PROTOTYPES FOR EUROPEAN PUBLIC ADMINISTRATIONS (ASTRA)

PROJECT NUMBER: 831

The main objectives of the project are to contribute to the common understanding of office automation problems in public administrations in different European countries, and to integrate state-of-the-art technology, concepts and results derived from relevant ESPRIT projects. It will also contribute, at application level, to the implementation of international standards.

The project consists of the following phases:

- definition of user requirements for a system supporting different types of objects
- definition of an office model with the identification of functional blocks and cooperation strategies
- implementation and assembly of components
- development of a prototype system.

The prototype will make use of advanced storage and retrieval systems based on optical discs. The results of the project are targeted at the public administrations of European member states.

Standards and management guidelines have been set by the consortium. The methodology has been defined for the analysis of user requirements in the four partner states, the user requirements analysis has been completed in the selected public administrations, and a synthesis of requirements achieved. The technological environment base for the prototypes has also been established.

Procedures, standards and techniques for public administration information systems will be derived from this project. The primary target is the integration of large-scale information handling within national bodies.

The information flow is primarily supported through the processing of multimedia documents. An ASTRA document specification has been established for the document filing and retrieval, covering the document viewed as a set of frames and with a document profile attached.

The hardware and system software specification has been completed. The prototype is being established based on the Olivetti and Bull hardware and system software in an open system.

The application software specification has also been completed and is being based on a server-client model, concentrated towards the processing of

multimedia documents. The client-servers cover the following functionality: archive, directory, file, mail (X.400) and print.

A set of guidelines for the design of Office Information Systems in the public sector has also been produced.

Contact Point

Mr. F. Gerbino
SOGEI S.P.A.
Advanced Technology Laboratory
Via C. Celso 4
I - 00161 ROMA

Tel: +39/6-8841101
Tlx: 621134
Fax: +39/6-4402686

Participants	Country	Role
SOGEI-SOC.GENERALE D'INFORMATICA	*I*	*M*
BULL S.A.	*F*	*P*
OLIVETTI	*I*	*P*
I/S DATACENTRALEN AF 1959	*DK*	*P*
ARCOS CONSEIL	*F*	*P*
TECSI-SOFTWARE	*F*	*P*
DATENZENTRALE SCHLESWIGHOLSTEIN	*D*	*P*
CESIA	*F*	*S*
MC 2	*F*	*S*
CRIAI	*I*	*S*
SOFTWARE SISTEMI	*I*	*S*

Start Date: 01-FEB-86 *Duration: 47 months*

CONSTRUCTION AND MANAGEMENT OF DISTRIBUTED OFFICE SYSTEMS (COMANDOS)

PROJECT NUMBER: 834

The primary objective of the project is the creation of a flexible, reliable and easy-to-use environment for the development and management of distributed applications in the office. In order to create this type of environment a range of tools must be designed and implemented. These can be functionally divided into:

- tools supporting the development of distributed applications
- tools supporting the execution of distributed applications
- tools supporting the user activities.

An important objective of the project is to combine and advance the state of the art of different technologies such as distributed databases, languages, software technology and communications into innovative and generalised tools for different application environments. These cover (with target dates):

- The definition of an architecture for workable distributed office systems (1988).
- The implementation of a low-level kernel shell providing the infrastructure for integrating a number of system services (1989).
- The implementation of linguistic object-oriented support ensuring widespread acceptance of the shell (1989).
- The implementation of a multi-database system (1989).
- The implementation of a multifile server system with a high degree of integration between application sites (1989).

The global architecture has been established using the object-oriented approach. The architecture encompasses the operating system and the data management systems as well as an integration approach for pre-existing applications (the COMANDOS Integration System (CIS)). The functional specification of kernel and system services has also been established, and interfaces and language requirements have been defined. A first prototype is expected at the end of the third year of the project. A further consolidation and integration phase will allow to provide an integrated prototype of the overall platform at the end of the fourth year.

Short-term exploitation of the results of Comandos includes the building of software products and services based on Comandos workpackages (performance modelling tool, event management logger, and system observation facilities), as well as the acquisition and exploitation of the object-oriented

technology for the design of a distributed directory service, a hypermedia system, and document management facilities. In the longer term, the experience and the results of this project will form the basis of a second development phase aiming to provide a pre-industrial version of the Comandos platform.

Contact Point

Mr. A Converti
OLIVETTI
Via Palestro, 30
I - 56100 PISA

Tel: +39/50-500211
Tlx: 574697
Fax: +39/50-501534

Participants	**Country**	**Role**
OLIVETTI	*I*	*M*
ARG APPLIED RESEARCH GROUP SpA	*I*	*P*
TRINITY COLLEGE DUBLIN	*IRL*	*P*
ICL	*UK*	*P*
INESC	*P*	*P*
NIXDORF COMPUTER A.G.	*D*	*P*
BULL S.A.	*F*	*P*
FRAUNHOFER IM	*D*	*S*
GLASGOW UNIVERSITY	*UK*	*S*
UNIVERSITY OF STUTTGART	*D*	*S*
LABORATOIRE GENIE INFORMATIQUE	*F*	*S*
CNR-IEI	*I*	*S*

Start Date: 01-MAR-86 *Duration: 50 months*

ACQUISITION, COMPRESSION AND REPRODUCTION OF TRUE-COLOUR IMAGE DOCUMENT

PROJECT NUMBER: 853

The four main objectives of this project were:

- Development of highly sophisticated colour image acquisition, processing and enhancement systems.

- Definition and development of colour image coding and compression algorithms, using techniques which take into account human perception features.

- Development of an advanced non-impact printing technique for colour images with fine tone definition.

- The testing of different non-impact printing techniques for rendition of true colour were made, results of which showed the ink-jet technique be too slow, leading to adoption of the thermal transfer technique for the final demonstrator.

An integrated prototype has been developed to demonstrate the result of the research. Algorithms were developed for:

1. Colour transformation rules from red, green and blue to cyan, magenta and yellow.

2. Error diffusion intensity modulation techniques. (Both algorithms 1 and 2 must be adapted to the utilisation of a wax thermal transfer printer).

3. Compression ratios from 10 to 20 on RGB true-colour images with a size of 512*512.

4. Studies and experiments have been carried out on colour image acquisition and enhancement. A general software architecture giving maximum flexibility has been defined and implemented.

All the programmes are embedded in the CIPLY package, which is a very general image-processing package. The identifiable product is the CIPLY software package, which could be used for image processing. Other packages exist on the market, but CIPLY may have more flexibility, making it easier to build an application.

The research will promote the use of colour documents in the office environment by developing new, advanced methods for colour image reproduction, storage and transmission. The consortium will exploit the project results industrially by 1990 in electronic colour processing systems and colour image reproduction peripherals.

Contact Point

Mr. G. Coli
OLIVETTI
Via Jervis 77
I - 10015 IVREA (TO)

Tel: +39/125-521492
Tlx: 210030
Fax: +39/125-521468

Participants	**Country**	**Role**
OLIVETTI	*I*	*M*
INTERSYS GRAPHIC	*B*	*P*
KATOLIEK UNIVERSITEIT LEUVEN	*B*	*P*

Start Date: 21-APR-86

Duration: 36 months

EUROPEAN TYPEWRITERS AND OTHER WORKSTATION INTEGRATION

Project Number: 855

The project investigates the role of typewriters in a future office automation environment where communicating typewriters, word processors, personal computers and PABX will interwork in distributed systems. The work programme contained the following objectives:

First phase:

- Analysis of technological and market trends for typewriters and workstations.

- Investigation of functional integration between typewriters and other office automation devices.

Second phase:

- Specification of a common code for all the European languages and specification of editing function commands for exchanging information between European typewriters.

- Proposal of communications protocols (PABXs or LANs).

- Proposal of a general architecture for interconnecting European typewriters and workstations via PABX or LAN.

A number of areas where the evolution of the technology is to be investigated have been identified. These are processing facilities, printing, storage, the user interface, display systems and communications. These investigations have been extended to cover functional user requirements for low-cost and high-cost office workstations, integration of text and graphics, graphics software environments and the use of existing standards. Preliminary results are as follows:

- A proposal for a framework for handling mixed mode communication has been submitted.

- Cost trends of base technologies for typewriters and PCs have been analysed.

- A report containing standard primitives for a new intergraphics system has been produced.

The project supports the integration of typewriters and low cost workstation units in the office information system domain. The results achieved are expected to be transferred to new products. The development of standards supported by the European market-leaders in this field will have a major strategic impact.

Contact Point

Mr. A. Muzzani
OLIVETTI
Typewriters Development
San Bernando
I-10015 IVREA (TO)

Tel: +39/125-524548
Tlx: 210030
Fax: +39/125-524200

Participants	**Country**	**Role**
OLIVETTI	*I*	*M*
TRIUMPH-ADLER A.G.	*D*	*P*
OLYMPIA AG	*D*	*P*
POLITECNICO DI TORINO	*I*	*S*

Start Date: 01-MAR-86

Duration: 32 months

TESTING AND ANALYSIS OF LOCAL AREA OPTICAL NETWORKS (TALON)

PROJECT NUMBER: 870

The TALON project aims to provide methods and instruments for testing complex optical LANs. It supports and complements communications system design activities. Many of the currently established methods for testing point-to-point optical fibre links are ineffective when applied to complex optical topologies. The project is almost complete. A multi-function tester, based on OFDR techniques, has been designed, built and tested.

The development of complex networks will be facilitated by the results of this project over the next two years.

Contact Point

Mr. G. Georgiou
COSSOR ELECTRONICS LTD
The Pinnacles
UK - HARLOW CM19 5BB, ESSEX

Tel: +44/279-26862 x7245
Tlx: 81228
Fax: +44/279-410413

Participants	Country	Role
COSSOR ELECTRONICS LTD	*UK*	*M*
NKT	*DK*	*P*

Start Date: 01-JUL-86

Duration: 36 months

EXTENDED OFFICE PROCESS MIGRATION WITH INTERACTIVE PANEL DISPLAYS (PROMINAND)

PROJECT NUMBER: 878

ProMInanD is an integrated approach for supporting cooperative office work. The approach is based on a concept of office worker-influenced migration of office processes as well as interactive panel devices. The project will result in two novel office technologies: an electronic circulation folder supporting arbitrary kinds of office tasks and an interactive panel device. A supportive human factors analysis and evaluation to optimize office worker satisfaction are also carried out.

Typical office processes consist of steps which are performed in parallel or sequentially. Each step is performed by an office worker playing a certain office role and working at a certain workstation. An office process has to be described formally in order to automate it. Each sequential part of a parallel office process is supported by an Electronic Circulation Folder (ECF), the process as a whole by a family of related ECFs. ECFs migrate from station to station where the different steps are carried out.

However, with the involvement of human beings, non-deterministic elements emerge caused by personal judgements and individual working styles. The extended office process migration system (MS) covers both the formally described migration of ECFs and the handling of exceptions. It offers a graphic user interface following the desktop metaphor.

The Interactive Panel Device (IPD) is a novel electronic device. It is computer controlled and consists of a set of building blocks comprising intelligent display and feedback elements. At any time, the elements can be manually placed on and removed from a modular board of arbitrary size. The panel device can be used for the entry of a range of different kinds of plans or their modification into a computer as well as for the representation of computer generated or controlled plans.

An evaluation plan covering the two new technologies as well as an integrated system was developed as part of the project's design phase. The system evaluation will emphasize the end-users perception of the technologies and provide new methods and tools for test and evaluation of essential new concepts and the user interfaces.

The office worker requirements have been analysed and documented. Starting from the user requirements a complete design of the whole system has been developed. The basic system has been implemented and demonstrated at the ESPRIT Conference 1988. The extended and full system will be developed and implemented by the end of 1989.

Successful completion of this project will result in a software product supporting a very wide range of ways of cooperation in offices. New cost effective complex office system applications can be supported by the results of this project.

Contact Point

Mr. U. Dittel
IAB GMBH
SZI
Einsteinstrasse 20
D - 8012 OTTOBRUNN

Tel: +49/89-60883125
Tlx: 524001
Fax: +49/89-60882346

Participants	**Country**	**Role**
IAB GMBH	*D*	*M*
MODULEX A/S	*DK*	*P*
SCAITECH A/S	*DK*	*P*
RISO NATIONAL LABORATORY	*DK*	*P*
TECHNISCHE.UNIVERSITAT.MUNCHEN	*D*	*S*

Start Date: 20-DEC-85

Duration: 48 months

PARALLEL ARCHITECTURE FOR NETWORKING GATEWAYS LINKING OSI SYSTEMS (PANGLOSS)

PROJECT NUMBER: 890

The aims of the project are:

- To define a methodology for the development of concurrent systems.

- To define a gateway architecture for the internetworking of OSI systems.

- To design a high performance network gateway using the methodology.

The project, which is now in its final year, is on target for achieving all these aims.

The primary aim of the project is to develop a systematic design and development methodology for concurrent systems which will a) reduce the amount of compromise and b) resolve the inconsistencies commonly encountered in the early stages of a design process.

In addition, and by way of proving the methodology, the project aims to design a high performance network gateway for linking OSI systems, using the PANGLOSS method. Whilst the methodology can be applied to concurrent systems in general, the choice of a gateway was seen as a sufficiently difficult target for testing the usability method. This is because of the predicted need for high traffic loads and transfer rates for gateways if they are to meet the demands of the new networking technologies (eg. local area networks, satellite links, fibre optics, broadband systems, and integrated services digital networks).

The PANGLOSS method relies on the use of a reference architecture, obtained and refined during the lifetime of the project by a process of abstraction from a number of well-defined scenarios, from which an implementation design can then be developed. The design process is guided at each stage by performance considerations which provide feedback to both the architectural and the implementation work. Performance objectives will be met by modular design and flexible topologies so that modules can be added when performance requirements increase. An important feature of the project is the use of formal methods as a design tool. This enables the design process to be verified at each stage to show logical consistency and conformity to overall objectives.

Contact Point

Mr. J. Harrison
CAP SCIENTIFIC LTD.
Scientific House
40-44 Coombe Road
UK - NEW MALDEN KT3 4QF, SURREY

Tel: +44/1-9429661
Tlx: 288633
Fax: +44/1-9498067

Participants	Country	Role
CAP SCIENTIFIC LTD.	*UK*	*M*
7-TECHNOLOGIES A/S	*DK*	*P*
UNIVERSITE DE LIEGE	*B*	*P*
UNIVERSITEIT VAN TWENTE	*NL*	*P*
UNIVERSITY OF READING	*UK*	*S*
STIRLING UNIVERSITY	*UK*	*S*

Start Date: 01-JAN-86

Duration: 48 months

AN INTELLIGENT GENERAL PUBLIC DATA, VOICE AND PICTURE STORAGE RETRIEVAL SYSTEM

PROJECT NUMBER: 901

This project offers a range of research and development activities in the field of intelligent data, voice and picture storage retrieval systems. It covers the development of a compact electronic storage system capable of providing rapid random access to very large volumes of multimedia information such as maps, photographs and other analogue-stored pictures with digitally-held text and data. Moving video and sound are incorporated in the base. Particular emphasis is given to a very user-friendly user interface which implements knowledge engineering techniques. The project aims at improving the acceptability of these systems and making them complementary to current systems through the prototyping of the LaserVision technology combined with new advanced user interfaces based on high-level expert systems.

The design of the system will concentrate on widely available low-cost workstations. Particular emphasis is given to an easy to use interface based on knowledge engineering techniques.

A series of major demonstrator projects has been completed using the LaserVision ROM system in the field of multi-media image based storage and retrieval systems for:

- DOMESDAY
- ECODISC
- VOLCANOES
- EUROFLORE.

Analysis of hardware architecture based on the LaserVision ROM for a future system is supported by the Imageur Documentaire, in which the key requirements are for an interactive and user-friendly image databank.

The general and public use of large-scale, multimedia databases has been greatly stimulated. In the case of the Domesday database, more than one thousand systems are in use, mainly in the UK.

Development of a LaserVision optical disc player has been running in parallel with the ROM disc development. Furthermore, two additional authoring packages have been developed: Domesday Display and DataMerge. These are both floppy disc based add-ons. Domesday Display consists of two discs, "Presenter" and "Captions". "Presenter" is like an electronic notebook that allows the user to store, in any sequence, the results of their searches for easy recall and presentation. "Captions" allows the user to produce a storybook of up to 200 images from the vast pictorial resources on LaserVision discs. The original system consisted of the BBC computer with the LaserVision player. Later developments in the project

resulted in an ITSM PC-compatible system in order to align with standards in Europe.

In addition, studies of image databanks and of the pertinent market sectors have been made.

Contact Point

Mr. F. Rietveld
PHILIPS INTERNATIONAL B.V.
HIS, Interactive Optical Systems
Building HWQ-6 — *Tel: +31/40-756497*
Postbox 218 — *Tlx: 35000*
NL - 5600 MD EINDHOVEN — *Fax: +31/40-756875*

Participants	**Country**	**Role**
PHILIPS INTERNATIONAL BV	*NL*	*M*
BBC INTERACTIVE TELEVISION UNIT	*UK*	*P*
LOGICA UK LIMITED	*UK*	*P*
SEP	*F*	*P*
BUREAU MARCEL VAN DIJK S.A.	*B*	*S*
UNIVERSITE DE NANCY-CRIN	*F*	*S*

Start Date: 18-DEC-85 — *Duration: 33 months*

CODING FOR MOVING PICTURE AND STILL PICTURE AT 256 KBITS/S AND 64 KBITS/S

PROJECT NUMBER: 925

The project addresses advanced compression techniques for moving video and still picture coding for teleconferencing applications. After reviewing state-of-the-art techniques and requirements, the project objectives are to:

- Achieve very high compression rates for videoconference-grade image motion with good resolution and quality. Advanced intraframe and interframe compression techniques are being investigated, including orthogonal transform coding algorithms.

- Achieve high picture quality and resolution for still-picture coding in order to reproduce business graphs, technical drawings, and photographs.

- Define a proposal for a standard for moving image codecs.

Advanced algorithms have been selected and defined. They have been tested by computer simulation. Impressive simulation results have been demonstrated of the real-time transmission of moving images over a 64 Kbit/s link. This technique, fully implemented, would allow the use of ISDN as a carrier for the setting up of video conferences.

Contact Point

Mr. J.P. Haag
CIT ALCATEL
Centre Villarceaux
B.P. 6
Route de Villejust-Nozay
F - 91620 LA VILLE DU BOIS

Tel: +33/1-64492060
Tlx: 692412
Fax: +33/1-69015119

Participants	Country	Role
CIT ALCATEL	*F*	*M*
TELEFONICA CTNE	*E*	*P*
STA ELETTRONICA AUTOMAZIONE	*I*	*P*
TE.KA.DE.	*D*	*P*
STE ANONYME TELECOMMUNICATIONS	*F*	*P*
GEC RESEARCH LABORATORIES	*UK*	*P*

Start Date: 02-JAN-86 *Duration: 21 months*

INTELLIGENCE AND KNOWLEDGE-AIDED RECOGNITION OF SPEECH (IKAROS)

PROJECT NUMBER: 954

The aim of the project is to evaluate AI techniques for speaker-independent understanding of continuous speech. This project is complementary to project 64 (SPIN). A feasibility test has been performed by implementating a system for recognising and understanding speech.

The system is based on a blackboard architecture. This structure allows the use of independent knowledge sources communicating through a global database. It is able to cope with fuzzy data and can manage conflicting hypotheses.

After 30 months of work, the following results have been achieved:

- Definition and implementation of a blackboard-based architecture using the LORE object-oriented language. This architecture allows the easy use of previously defined methods, such as the phonetic unit lattice generator developed in the SPIN project, in cooperation with linguistic data sources developed in IKAROS. Moreover, because of the generality offered by object-oriented programming, the blackboard has already been used in a number of applications outside the project.

- Lexical, syntactic and semantic data sources have been defined.

- Adaptation of the SPIN continuous speech phonetic recognizer. This delivers a lattice of phonetic units for input to the IKAROS system. It is based on the probabalistic representation of speech using hidden Markov models.

- The development of a complete software signal processing environment for the construction of the speech signal databases needed for the accoustic-phonetic decoding process.

AI techniques are expected to have a considerable impact in the early 1990s on systems based on speech understanding. Possible applications could include workstations, intelligent PABXs, database queries and updates, value-added systems and management information systems.

Contact Point

Mr. F. Monnet
CGE LABORATOIRES DE MARCOUSSIS
Route de Nozay
F - 91460 MARCOUSSIS

Tel: +33/1-64491576
Tlx: 692415
Fax: +33/1-64490694

Participants	**Country**	**Role**
CGE. LAB DE MARCOUSSIS	*F*	*M*
GEC RESEARCH LABORATORIES	*UK*	*P*
UNIVERSITY OF STUTTGART	*D*	*P*
FRAUNHOFER INSTITUT	*D*	*S*

Start Date: 01-JAN-86

Duration: 38 months

COMPONENTS FOR FUTURE COMPUTING SYSTEMS (COCOS)

PROJECT NUMBER: 956

The main objective of this project is the provision of a set of common tools for building future information systems. Hardware and software issues will be combined in a top-down design.

At the application level, the user will be provided with a dynamic environment in which to create and define his own application through a man-machine interface. The environment will include tools for viewing different tasks simultaneously (multi-windowing), for quickly switching between these tasks, and for invoking actions with natural commands such as graphical symbols.

The middle level will be a self-contained environment acting as the conduit between the applications and the lowest levels. It will provide support for programming language interfaces to services and functions commonly provided by operating systems, and an underlying homogeneous object model with a fine level of granularity.

The lowest level contains the hardware circuitry that best supports the application language. RISC CPUs and dedicated VLSIs will be investigated, and network and disc interfaces and memory management will be studied along with the selected CPU.

After one year of work, a state-of-the-art report on all the relevant technologies that will be involved in the project has been produced. This report covers areas such as hardware, standard CPU chips, RISC chips, internal and external bus architecture, and interconnection schemes in multiprocessor systems. It also covers software, including operating systems, distributed systems, programming languages, object-oriented environments, and the man-machine interface.

Current proposed objectives include a typed object-oriented language (LE TOOL) and a system based on PARLOG (a parallel logic programming language). PARLOG will be used to implement the formalisms required by the chosen applications as well as by the man-machine interface. Tools for the compiler generation will yield both PARLOG compilers and compilers for other high-level languages.

Current work on the hardware level includes the use of a RISC chip and of a micro-programmable symbolic coprocessor , both of which have been developed by the partners.

A new area of research has emerged within the framework of the project. In order to integrate many of the concepts studied, several partners have decides to focus on tasks relating to multimedia workstations. These tasks range from studying the human factors of the new multimedia input and output devices, to the specification of an appropriate architecture using second-generation RISC chips.

Which the results so far achieved:

- Bull plans to further develop its work in 3D graphics and voice processing.
- Olivetti's and Acorn's developments in hardware architecture have helped to define the next generation of workstation CPUs and peripheral subsystems.
- ICL's work on software architectures will be the basis from which the whole Multiworks interactive environment (ESPRIT II project 2105) will develop.

Contact Point

Mr. L. Sauter
BULL MTS
7 Rue Ampere
B.P. 92
F - MASSY CEDEX

Tel: +33/1-64479090
Tlx: 690079
Fax: +33/1-69308141

Participants	**Country**	**Role**
BULL MTS	*F*	*M*
ICL	*UK*	*P*
OLIVETTI	*I*	*P*
SGS MICROELETTRONICA SPA	*I*	*P*
NIXDORF COMPUTER A.G.	*D*	*P*
INRIA	*F*	*S*

Start Date: 01-JAN-86

Duration: 36 months

HIGHLY SECURE OFFICE INFORMATION SYSTEMS - DEFINITION PHASE (MARS)

PROJECT NUMBER: 998

This project addressed the area of security and integrity in office systems in order to make substantial and innovative proposals to deal with the needs of future office systems. The project will strengthen the development of secure office systems by providing input to European standards work. The objectives of the project were:

- To study the current nature of security threats and to examine state-of-the-art countermeasures in office information systems.

- To develop a security model for an office information system, with particular emphasis on the banking environment.

- To produce guidelines for implementing standards for secure office information systems, again emphasising banking.

- To specify the requirements for a key-management centre and end-user security facilities.

The state-of-the-art study has produced a comprehensive description of possible threats and risk-analysis methods and the ways and means of implementing appropriate safeguards. Two security models were developed and guidelines produced.

The security models comprise a workstations model and a communication model. Based on a component/countermeasures matrix with eight different levels of security, the workstation security model will support the implementation of security measures by analysing the workstation into its component parts and determining the countermeasures needed. The communication model supports the design and the tests by providing a medium through which the results of the design can be expressed.

Together with the models, the guidelines promote the implementation of security in office automation systems by supplying precisely defined recommendations in the follwing main areas:

- access control

- workstations

- encryption

- auditing.

In the last phases of the project, work has been directed towards applying the models and recommendations to an existing office application requiring a high level of security in order to define requirements and design specifications.

The security system is specified around an ISO/OSI architecture that clearly specifes the components and protocol layers. End-User Security Facilities (EUSFs) protect both the application interfacing to the user and the transport layer in the communications system by using the services provided by a Key-Management Centre (KMC).

The key-management facilities are based on a three-level hierarchy using symmetrical keys for confidentiality and data integrity. Asymmetrical keys are used for authentication, non-repudiation and key management. A security officer appointed in each branch handles the local security management, and personal chipcards are used in the identification process.

The EUSFs are an integrated part of the workstations and the front-end processors and they consist of hardware in a cryptobox as well as software running on the processor. Based on public keys, the system is prepared for the future by allowing users registered by the KMC to set up secure communications by the automatic exchange of secret keys.

The requirements and design specifications, together with the enhanced ability to specify and design secure systems, will have a very positive impact on the reliability of future secure office systems. The project has clearly shown the importance of well-defined and standardised security facilities and has demonstrated how these can be integrated into the systems themselves. The results from the project support the development of secure office systems from European manufacturers, and it provides input for further standardisation in the area.

Contact Point

Mr. G. Borup
BBN Communications A/S
Lautrupvang 1
DK - 2750 BALLERUP

Tel: +45/42-651144
Tlx: 35111
Fax: +45/42-654373

Participants	**Country**	**Role**
BBN Communications A/S	*DK*	*M*
BERTIN & CIE	*F*	*P*
UNIVERSITY OF EAST ANGLIA	*UK*	*P*
PROTEXARMS	*F*	*P*
COPS (EUROPE) LTD	*IRL*	*S*
UNIVERSITAET ZU KOLN	*D*	*S*

Start Date: 18-DEC-85

Duration: 39 months

PILOTING OF THE OFFICE DOCUMENT ARCHITECTURE (PODA)

PROJECT NUMBER: 1024

The goal of this project is to evaluate and to advance the ISO and CCITT standards on Office Document Architecture (ODA), and to accelerate the exploitation of ODA.

The project produced the following main results:

- ODIF Document Interchange

  Demonstration of the ODA standard by the interchange of documents between commercially available office equipment (word processors, workstations, printers) from five different manufacturers at the Hannover Fair CeBIT in 1987 and 1988.

  This included the definition of Document Application Profiles with increasing capabilities, and the provision of converters to and from proprietary document formats. The software development was based on commonly used software ("PODA toolkit") including an ODA formatter, an ODA storage manager and an adaptable format checker which validated the syntax of an ODIF data stream format.

- ODA Evaluation

  Development and demonstration of a final form imager which converts a formatted-form ODIF document into an existing laser printer's format in order to print interchange documents.

  Development and demonstration of a font support system.

  Design and specification of components for an ODA-conforming formatting document editor, additional and complementary to components which were prototyped in ESPRIT project 121. This also included prototyping a document class definition editor.

- ODA Advancement

  Development of methods and components in order to handle confidential documents in office systems.

  Investigation of concepts for data in documents.

  Prototype work on audio systems in the context of ODA.

  Investigative and prototype work on user interfaces.

The experience gained from this project was continually submitted to the standardisation organisations, and has had an impact both on the structure specifications ISO IS/8613 and on the Document Application Profiles.

Results of the project, particularly from the ODIF document interchange work, will be exploited to provide products that will become commercially available in the 1990s.

Contact Point

Mr E. Koether
SIEMENS AG
K Systeme AP 312
Otto-Hahn-Ring 6
D - 8000 Munich

Tel: +49/89-63644728
Tlx: 521090
Fax: +49/89-63646404

Participants	**Country**	**Role**
SIEMENS	*D*	*M*
BULL	*F*	*P*
ICL	*UK*	*P*
OLIVETTI	*I*	*P*
TITN-ALCATEL	*F*	*P*
NIXDORF	*D*	*S*
OCE	*NL*	*S*
QMC-ISL	*UK*	*S*
SEPT	*F*	*S*
UCL	*UK*	*S*

Start date : 19-DEC-1985

Duration : 39 months

HUMAN AND ECONOMIC FACTORS IN IT-UPTAKE PROCESSES (IT-UPTAKE)

PROJECT NUMBER: 1030

The project focuses on the role of human, organisational and economic (HOE) factors in the effective and productive uptake of information technology (IT) application systems in complex work environments. The project explicitly addresses IT uptake in more traditionally organised work environments and in the new forms of work organisation made possible by teleworking. While office systems are the major focus of concern, the project also addresses developments in computer integrated manufacturing (CIM).

The major outputs will be a generic model of HOE factors in the IT uptake processes; an instrument for the collection of information concerning these HOE factors in working environments; field trials of the generic model and instrument in working environments; and guidelines concerning the management of HOE factors in the uptake of IT and telework in working environments. The project is complementary to ESPRIT Project 56 (FAOR) and liaises and exchanges information with it.

A third version of the model and instrument has been developed and subsequently refined through field testing in a wide range of user environments. This version of the model and instrument integrates expertise and perspectives from four areas: human and organisational factors in IT/telework uptake processes; traditional business systems analysis techniques; vendors' perspectives on IT/telework uptake processes; and expertise concerning the diffusion potential and uptake dynamics of telework. This extended and refined version of the model provides a comprehensive framework for conceptualising, understanding and investigating or intervening in IT/telework uptake processes in user environments.

An analysis of the potential and the uptake dynamics of telework has been conducted through large scale empirical surveys, and their indications refined through detailed field trials undertaken in a range of user environments. On the basis of this work and previously described modelling work, the refined extended model provides an integrated framework where IT and telework uptake processes are conceptualised as being embedded in broader organisational change processes.

A test-bed investigation has been undertaken using traditional business systems analysis techniques, and an IT system has been proposed which would support and improve the functioning of the test-bed site. Significant features of this proposed systems design concern the systematic incorporation of human, organisational and teleworking perspectives into the final specification for the design of the proposed IT application system.

Currently, a guidelines package for managing IT/teleworking uptake processes in user environments has been produced. This document emphasises the management of human, organisational and economic factors, and is targeted at managing IT/telework uptake in user environments. It is also of considerable benefit to suppliers of IT products and services and to IT manufacturers.

Contact Point

Mr. B. Ennis
MEMORY COMPUTER PLC
Clonard House
Sandyford Road
IRL - DUBLIN 16

Tel: +353/1-989733
Tlx: 30721
Fax: +353/1-988665

Participants	Country	Role
MEMORY COMPUTER PLC	*IRL*	*M*
EMPIRICA	*D*	*P*
WORK RESEARCH CENTRE LTD	*IRL*	*P*
STC TECHNOLOGY LTD	*UK*	*P*

Start Date: 07-APR-86 *Duration: 23 months*

AN OFFICE SYSTEMS RESEARCH WORKSTATION FOR EUROPE (ERW)

PROJECT NUMBER: 1032

The overall objective of this project was a hardware configuration and software environment suitable for research and prototyping advanced integrated office systems. This will strengthen the European computer industry and reduce its dependence on costly foreign products. Specific technical objectives included the development within 3 years of an advanced prototype with:

- Very high performance at a low cost.
- Hardware design to exploit VLSI manufacture and RISC architecture in the processor design.
- Open architecture so that resources elsewhere on the network can be substituted for local resources.
- Tools for language development for generating RISC code to interpret a virtual-machine instruction set.
- Programming environments for several languages.

The project was terminated in October 1986.

Participants	County	Role
WHITECHAPEL COMPUTER	*UK*	*M*
OLIVETTI	*I*	*P*
QUEEN MARY COLLEGE INTERACTIVE	*UK*	*P*
SIEMENS	*D*	*P*
VRIJE UNIVERSITEIT AMSTERDAM	*NL*	*P*
UNIVERSITY OF SUSSEX	*UK*	*P*

Start Date: 01-JAN-86 *Duration: 9 months*

AMORPHOUS SILICON CONTACT IMAGER FOR OFFICE AND GRAPHIC APPLICATIONS

PROJECT NUMBER: 1051

The three main objectives for the project, containing both short and medium-term goals, are:

- Prototyping of a very compact contact imager with amorphous silicon sensor elements, creating a linear scanning array with better opto-electronic properties than those currently available. The contact imager will be packaged and incorporated and evaluated in a system. A market study will determine the quantitative targets.

- Investigation of alternative deposition techniques for amorphous silicon (homocvd, photocvd) aiming at an increase in the stability of the deposited films.

- Study of the integration of thin film switches and shift registers on the same substrate. This will avoid cumbersome and expensive hybrid interconnections.

Two scanners (10cm length/4 pixels per mm and 21-25 cm length/8 pixels per mm) have been developed, using glow discharge deposition for the amorphous silicon sensor elements. Electrical measurements on single sensor elements have proved the concept. According to the read-out results, two different phenomena are apparent, each addressing different application fields: a fast (2ms/line) linear read-out and a slow but cheap matrix read-out without crossovers. The sensor arrays were assembled in an A4 package and a read-out technique based on crystalline driver chips in a linear, integrated mode was proposed and worked out. A microfilm scanner was set up as an in-system evaluation tool. The measurements on our single phosensors were compared with measurements on commercially available contact imagers.

The alternative deposition techniques (homocvd and photodissociation with UV-light and ArF-laser) have been thoroughly investigated and optimised. For homocvd it has been found that very good boron-doped window layers can be produced for the sensor elements and that the Staebler-Wronski effect plays a much less severe role than on glow discharge deposited films.

The most cost-effective way to fabricate the complete contact imager is to integrate everything, including switches and shift registers, on the same substrate. A theoretical study proved that in this case polysilicon thin film transistors are necessary because of speed (carrier mobility) considerations. Discrete polysilicon TFTs were fabricated using a technological process never exceeding 630 C and not using ion implantation. This resulted in a channel mobility of 16.5 cm /Vs and a current on/off ratio of more than 105. Finally, the possibilities of CW and pulsed laser recrystallisation of amorphous silicon to produce large-grain, high quality polysilicon at low temperature have been investigated.

Contact Point

Ing. J. Nijs
IMEC V.Z.W.
Kapeldreef 75
B - 3030 LEUVEN

Tel: +32/16-281284
Tlx: 26152
Fax: +32/16-229400

Participants	**Country**	**Role**
IMEC V.Z.W.	*B*	*M*
AGFA-GEVAERT	*B*	*P*
MESSERSCHMITT BOLKOW BLOHM	*D*	*P*
CNRS	*F*	*P*

Start Date: 01-JAN-86

Duration: 27 months

MULTIPOINT INTERACTIVE AUDIOVISUAL COMMUNICATION (MIAC)

PROJECT NUMBER: 1057

The objective of this project was to develop a system for the simultaneous communication of speech, images and data between persons at two or more widely separated locations, using ISDN and other 64 Kbit/s networks.

A demonstrator will be developed in a real environment. It will be a multipoint international audioconference system with visual and office system aids, interconnected using terrestrial and satellite links. The signal and protocol structure that has been developed is applicable to a wide range of other audiovisual services, and has been adopted as part of the CEPT audiographic teleconference recommendation (ref. T/N31-02). The conferencing system was successfully demonstrated in multipoint mode between eight European locations in April 1988. The demonstration included high quality speech, chairman's control and meeting aids (facsimile, SPTV, telewriter). A follow-on project in this area (MIAS, ESPRIT 2684), is further developing this system in the areas of ISDN and multimedia facilities.

Contact Point

Mr. W. Clark
RT 4321
BRITISH TELECOM PLC
Martlesham Heath
UK - IPSWICH IP5 7RE, SUFFOLK

Tel: +44/473-642006
Tlx: 988811
Fax: +44/473-643791

Participants	Country	Role
BRITISH TELECOM PLC	*UK*	*M*
CSELT S.P.A.	*I*	*P*
INDUSTRY FACE STANDARD SPA	*I*	*P*
STC TECHNOLOGY LTD	*UK*	*P*
TELECOM. RADIOELEC. & TELEPH.	*F*	*P*
CNET	*F*	*P*
DR. NEHER LABORATORIES	*NL*	*P*
TELEFONICA CTNE	*E*	*P*

Start Date: 07-JAN-86

Duration: 30 months

DYNAMICALLY ADAPTABLE MULTI-SERVICE SWITCH (DAMS)

PROJECT NUMBER: 1059

The objective of the project is to identify and exploit the relative advantages of a switch-oriented communication architecture with respect to a wide variety of traffic and services required in the office. Dynamic allocation of bandwidth, according to the varying needs of the users, will be investigated in order to manage the available bandwidth in the most efficient way.

Studies entitled "system external specification" and "preliminary system investigations and conclusions" have been produced; the former lists the external requirements of an advanced PABX and the latter characterises the services to be supported. This leads to the outline architecture, which is based on an optical ring backbone.

A technology study has been completed showing the current availability of component parts of the system. A marketing report by the subcontractor, Langtons (London) has highlighted the need and timeliness of the project whilst warning of the stiff competition from Japanese and US suppliers.

Industrially exploitable results are expected by early 1991. These will be based on R&D to be carried out following the study phase. This work is being followed up in ESPRIT II project Number 2146 entitled "Dynamically Adaptable Multiservice System (DAMS)".

Contact Point

Mr. D.R. Beddoes
PLESSEY COMPANY PLC
Roke Manor
UK - ROMSEY S051 0ZN, HAMPSHIRE

Tel: +44/794-833416
Tlx: 47311
Fax: +44/794-833434

Participants	Country	Role
PLESSEY OFFICE SYSTEMS LTD	*UK*	*M*
JEUMONT-SCHNEIDER	*F*	*P*
TELENORMA	*D*	*P*

Start Date: 03-FEB-86

Duration: 30 months

MULTILINGUAL INFORMATION SYSTEM (MIS)

PROJECT NUMBER: 1533

The MIS project addressed semantic representation of natural language sentences which could be effectively used to query and manipulate a multilingual structured document database. This project examined the feasibility of designing a core system for handling information retrieval requests to data and document bases in five of the major European languages.

The state of the art was investigated in those domains where advanced products could be developed which would only be marketed after a period of four to seven years. These included natural language analysis and generation, dialogue and planning, and knowledge representation and engineering, together with machine translation and information and information retrieval in a multilingual context. Also, a market study was undertaken to gain an appreciation of the economic viability of such products and the manner in which they should be exploited.

Propositions were made concerning the underlying architecture of such a system based on the current state of the art, progress made and the competence of the partners. These propositions take the requirements of multilingualism and the types of knowledge involved into account.

Based on a series of demonstrations, investigations were carried out into the technical aspects of each language studied. It was also recognised that full dialogues should be supported between the user and the system. The risk of constructing an architecture of a multilingual information system entirely around the concept of a dialogue planner is considered to be high. However, an acceptable paradigm for handling dialogue was nevertheless considered.

Intelligent dialogue is fundamental for the use of any natural language product operated by persons not fully aware of the system's capabilities or of the data it contains. It strengthens the overall system and enables a mastering of the complexity of handling the knowledge manipulation of the natural language analysis components.

The feasibility study has resulted in a proposal for future collaborative development to provide a series of prototypes for architectural validation. This is because multilingual information is complex to design and distinct architectural options are not yet evident.

Contact Point

Mr. M. Bennett
BULL S.A.
B.P. 68
F - 38402 ST.MARTIN D'HERES CEDEX

Tel: +33/7-6514854
Tlx: 320245
Fax: +33/7-6547615

Participants	**Country**	**Role**
BULL S.A.	*F*	*M*
ICL	*UK*	*P*
OLIVETTI	*I*	*P*
NIXDORF COMPUTER A.G.	*D*	*P*

Start Date: 01-JAN-87

Duration: 18 months

MULTILINGUAL SPEECH INPUT-OUTPUT ASSESSMENT, METHODOLOGY & STANDARDISATION

PROJECT NUMBER: 1541

The objective of the project is to provide a pan-European basis for the assessment of speech technology devices

The now completed definition phase is allied to the existing SPIN programme (Esprit project 64). It involves recogniser and synthesiser assessment in each of the participating countries, and is necessarily founded on the use and systematic archiving of available databases of words and sounds for general use within the Community. The collation of material coming from the UK, France, Holland, Denmark, Italy and North America is being undertaken as a first step.

Within the definition phase, tentative uniform protocols have been established at the technical level for media and recording conditions. In the full project, levels of phonetic, linguistic and cognitive difficulty of test materials will also be taken into account. This will enable cross-language work to be properly founded. The partners in the project will work towards the establishment of these protocols and their progressive refinement by experiment and test. Broadly acceptable cross-language standards will be defined in this way. These will provide the foundation for a progressively more rigorous comparison of existing devices, and contribute to the development of new speech I/O processors. The initial requirements will be met in a very straight forward fashion by establishing commonly accepted and produced databases. The project will also provide the means for the assessment of the next generation of speech I/O devices.

The first phases of the multilingual work are directed towards the establishment of a set of strictly practical tools for everyday use in laboratories and industrial settings in the Community. The work also aims to establish the basis for future development in the field of language-independent assessment techniques, for both speech recognition and speech synthesis.

EUROM, a first database of sounds for language independent assessment of codes, has been developed. The standard workstation and complete hardware architecture for the speech input-output assessment has been defined.

Parallel work is taking place in the different member countries to establish normative databases for the purposes of referencing and test construction; this will be the basis for cross-European developments in format and structure. The cross-comparison of this corpus of Community speech data provides a specification of normal speech which is vital to both new product design and its evaluation. In the context of the Community, its availability will assist in the development and application of products both internally and externally.

Contact Point

Prof. A Fourcin
UNIVERSITY COLLEGE LONDON
Wolfson House
4, Stephenson Way
UK - LONDON NW1 2HE

Tel: +44/1-3871055
Tlx: 28722
Fax: +44/1-3807408

Participants	**Country**	**Role**
UNIVERSITY COLLEGE LONDON	*UK*	*M*
CSELT S.P.A.	*I*	*P*
UNIVERSITY OF AMSTERDAM TNO	*NL*	*P*
CNET.	*F*	*P*
JUTLAND TELCO (JTAS)	*DK*	*P*

Start Date: 01-JAN-87

Duration: 12 months

INTELLIGENT BUSINESS APPLICATION SUPPORT SYSTEM (IBASS)

PROJECT NUMBER: 1573

The IBASS project aimed to develop tools and techniques which allow the end-user to create and maintain an office application without the need

for direct help from a professional systems analyst/designer. It was also intended to develop a system in which the user will be supported by knowledge-based help systems (both individual and organisational). A further objective was that the system to be developed should work in an object-oriented (real world) environment by means of adaptable human-machine and machine-machine interfaces.

The feasibility study, which was made to specify prototype demonstrator systems, is based on a model with four components: a user interface, an organisation modelling system, a design manager, and an object-oriented environment.

The IBASS scenario presented at the end of the project describes the problem space and presents the results of a study on organisational and technical requirements.

Specific applications (budgeting, order processing, loan application) were studied with the intention of identifying common characteristics needing support.

Finally, the communications for networking, based on the ISO standards and their interfaces with the organisational tools to be developed, were investigated from the point of view of supplying services and utilities for supporting fully integrated applications both at company and intercompany levels.

Summarising the achievements, it was clearly apparent that there is a need for a sound methodology to guide the design of applications software, and for a set of tools to aid in the effective implementation of new IT technologies for any organisation. One partner therefore decided to use object-oriented programming as the foundation for future work.

Further investigation and developments of powerful sets of tools and designs, to be tested in various business and organisations, will be proposed for a future project within ESPRIT II. These tools and designs are intended to provide systems which are much more flexible and user-friendly in an integrated environment than those currently available. The integration of the tools should lead to a faster development of new types of more user-friendly applications by manufacturers and software houses.

Contact Point

Mr. M Hermelbracht
NIXDORF COMPUTER A.G.
Pontanusstrasse, 55
D - 4790 PADERBORN

Tel: +49/5251-105314
Tlx: 52517
Fax: +49/5251-103105

Participants	**Country**	**Role**
NIXDORF COMPUTER A.G.	*D*	*M*
BULL S.A.	*F*	*P*
POLYTECHNIC OF THE SOUTH BANK	*UK*	*P*
LANGTON LIMITED	*UK*	*P*
DATAMONT SPA	*I*	*P*

Start Date: 01-JAN-87

Duration: 18 months

ESPRIT II PROJECTS

STORAGE, PROCESSING AND RETRIEVAL OF INFORMATION IN A TECHNICAL ENVIRONMENT (SPRITE)

PROJECT NUMBER: 2001

At present major problems exist with producing, maintaining and updating technical documentation and, as a result, delays in releasing new products and inconsistencies in product documentation often occur. These problems frequently stem from the lack of availability of adequate support tools, or the lack of integration among the tools that do exist. The SPRITE project aims to solve these problems by developing an integrated system for the production and maintenance of technical documentation, for example in departments responsible for the development of user manuals.

The SPRITE system has six components: a multimedia database (text and graphics), a document processor, a scanning and recognition component, an information acquisition component, a printing component and a retrieval component.

The central component of the system is the multimedia database (MMD), in which documents and information extracted from external sources, as well as newly generated documents, are stored. Document versions and version dependencies between document parts will be maintained in the MMD. Searching in the MMD will be possible using a guide which enables unstructured searches in the database to be made by jumping from one information entity to a related other. Finally, as technical documentation generally uses a large amount of data and has a long life cycle, the MMD needs to be supplied with mass storage capabilities in the form of optical storage.

For the generation of documents the system will have a multimedia WYSIWIG document processor supporting both text and graphics editing. One of the important features of the document processor is its multiauthor capability. Documents in technical environments, such as service manuals, are usually very large. Therefore it is of great importance to support the editing of documents by several authors concurrently.

Printing will be made available on a high quality and high volume laser printer, enabling, therefore, not only the creation of draft documents, but also the production of a series of documents.

Reusing existing information, both on paper and in electronic form, is well supported. The scanning and recognition component of the system captures documents and drawings (up to A0), converts them into the internal SPRITE format, and stores them in the MMD. This conversion will be carried out where possible by sophisticated pattern recognition modules so that minimum user assistance is required.

Facilities for information acquisition from selected main frames and CAD systems will be available to integrate SPRITE with existing environments. Information acquisition will be supported both on the database access level and on the file transfer level.

Currently, products and research prototypes exist that already provide functions comparable with those of SPRITE components. However, these products lack integration at two levels: at the level of the different components of the system, and at the level of the interface between the complete documentation system and the existing infrastructure at a customer site. SPRITE will pay special attention to these two types of integration.

The industrial partners in the consortium intend using the results of SPRITE in their future products. Complete solutions for the creation and maintenance of technical documentation are being considered, as well as products based on selected components of the SPRITE system.

Contact Point

Mr. E.A.R. Van der Linden
OCE-NEDERLAND B.V.
P.O. Box 101
NL -5900 MA VENLO

Tel: +31/77-592055
Tlx: 58037
Fax: +31/77-594313

Participants	**Country**	**Role**
OCE-NEDERLAND B.V.	*NL*	*M*
ALCATEL-TITN	*F*	*P*
AEG OLYMPIA AG	*D*	*P*
ADV/ORGA F.A. MEYER AG	*D*	*P*
TILBURG UNIVERSITY	*NL*	*P*
TRINITY COLLEGE DUBLIN	*IRL*	*P*
ARMINES	*F*	*S*
UNIVERSITAET HAMBURG	*D*	*S*

Start Date: 16-JAN-89 *Duration: 42 months*

ULTRA-WIDEBAND COHERENT OPTICAL LAN (UCOL)

PROJECT NUMBER: 2054

This project aims to demonstrate experimentally the enhanced performance and flexibility which can be built into a multichannel, ultra-wideband network using coherent optical techniques.

Current fibre-optic local area networks have noticeable limitations in both bandwidth and receiver sensitivity. Up to now LANs have been mainly used to connect terminals with hosts (i.e. for the distribution of the services provided by a common resource) rather than to achieve resource distribution. Yet resource distribution is a cost-effective solution, avoiding unnecessary redundancy and providing increased system reliability and more flexible and powerful operation.

However, as resource distribution involves the direct interconnection of different machines, the rate of information exchange increases considerably. Given that current 32-bit microprocessors are capable of moving data at rates up to 200 Mbytes/s, the communications subsystem must provide a bandwidth in the Gbit/s region if it is to meet the requirements of a fully distributed system.

It is important to point out that the network architecture envisaged complies fully with OSI recommendations. Multichannel networks can therefore be considered as a natural evolution of already existing high-speed LANs rather than as new systems not open to communication with pre-existing networks. This is made possible by the constant monitoring of the recent results of standardization groups during the definition of both the network architecture and the protocols for UCOL. At the same time, though, UCOL is actually the first candidate to be an ultra-wideband network standard.

In order to show the network's flexibility and performance, and so validate the use of coherent optics, the project will address the first three OSI layers (which are strictly related to the technology) and their related management functions.

A key aim of the project is to demonstrate that the bandwidth and the optical frequency-tuning facilities offered by coherent optics can be conveniently exploited and used in an OSI context to achieve a universal network, capable of connecting existing networks and of supporting new wideband services. The tuning characteristics of optical frequencies, in particular, enhance the network's flexibility; and its ability to self-reconfigure without physical changes facilitates its adaptation to future requirements. This is an important feature, since it highlights one of the main advantages of the multichannel system over the baseband approach currently pursued by other laboratories.

Coherent optical techniques afford a system capacity in the order of many Gbits/s, with inherent improvements in signal-to-noise ratio of up to 20 dB, compared with classical methods. Direct detection systems only exploit a few GHz of the available optical fibre bandwidth (~30 000 GHz) . Although wavelength division multiplexing could offer a solution, the rigid channelling scheme and the wide channel separation required are serious limitations in a flexible multichannel environment.

The advantages offered by the UCOL approach can be summarized as follows:

- The attainable bandwidth is wider, and it may be extended, by increasing the number of frequencies, with little impact on existing hardware and software.

- The use of a multichannel system with tuneable frequencies affords additional flexibility; by suitably reallocating frequencies it is possible to effect a virtual reconfiguration of the network without any physical changes.

- High receiver sensitivity allows networking over longer distances and, in the context of fully passive multipoint networks without signal regeneration, allows provision of a larger number of network access points than is possible with current optical techniques.

- Optical amplifiers can be used.

The system concept which will be implemented at the physical layer within the proposed programme is based on multichannel optical transmission with heterodyne detection, where all optical channels are synchronized to an optical reference comb. Work will evolve through a series of phases of experimental development leading to the production of practical integrated optical components and subsystems which will eventually be assembled into the final network demonstrator.

As the project will address both the technological and systems aspects of the technique it will ensure European leadership in the introduction of a new generation of networks into the market. Market analysis will also be carried out in order to describe in detail the emerging requirements for the bandwidth and performance offered by UCOL. To develop commercial products from the results of this project, the next stage will be to concentrate on reliability aspects and cost reduction. A key issue will be the optoelectronic integration of the subsystems. It can be anticipated that a number of spin-offs will be generated by both the technological and the networking sections of the project.

Contact Point

A. Fioretti,
FACE RESEARCH CENTRE
Via Nicaragua 10,
I - 00040 POMEZIA

Tel: +39/6-912851
Tlx: 613340
Fax: +39/6-912851 x255

Participants	Country	Role
INDUSTRIE FACE STANDARD SPA	*I*	*M*
GEC	*UK*	*P*
COSI	*I*	*P*
SEL	*D*	*P*
AEG	*D*	*P*
PTT NEDERLAND	*NL*	*P*
UNIVERSITY OF SOUTHAMPTON	*UK*	*P*
IDATE	*F*	*P*
TELETTRA-E	*E*	*P*
INESC	*P*	*P*
CGE - LABORATOIRES MARCOUSSIS	*F*	*P*
CIT ALCATEL	*F*	*S*
STC	*UK*	*S*

Start Date: 01-MAR-89

Duration: 24 months

INTELLIGENT COMMUNICATION INTERFACE (ICI)

PROJECT NUMBER: 2058

The ICI project deals with the research, development and demonstration of radio communication techniques for providing remote IT users with access to public network users and to services such as PC-to-PC and facsimile transmissions. In this context, remote users are those who can only be reliably linked through long-range (HF or MF) radio systems, as they are located in remote areas away from national communications facilities or are travelling by land, sea or air.

Existing remote users employing MF and HF radio communications to access the public networks are mainly those using the maritime mobile service. The systems available are generally limited to the transmission of telephony, telegraphy and telex which, apart from telex, are operated manually, requiring operators at coast stations to connect calls to and from the public networks. Such users may alternatively employ mobile satellite communication systems (eg. INMARSAT) which provide automatic access to numerous radio communications services including data and facsimile.

The aim of this project is to demonstrate the feasibility of providing automatic data and facsimile services for remote users via MF, HF and VHF radio systems.

The project will consist of four main areas:

- Specification of remote user and system interfaces to allow fully automatic two-way access between remote users and the public network for long-range radio.

- Definition and development of a remote user system that will register a link request and automatically set up a link with the required network user. The process used for setting up the link will use predefined information about the intended network user's location and facilities to select the path, and will also select the frequency and data bit-rate to use.

- Definition and development of a public network gateway that will detect and route calls from remote users to the required network user and set up a link with the required remote user. The setting up of a link to the remote user will require prior knowledge of that user's facilities, location and monitoring or some means of acquiring this information.

- Development of new techniques to enhance and optimise the performance of data communications over long-range HF radio links. This involves investigating techniques to provide real-time channel evaluation and computation of optimum transmission parameters such as bit-rate.

The research will begin with an analysis of the state of the art and with a theoretical evaluation of the technological alternatives. The technological approach which demonstrates the best potential for accomplishing the objectives of the project will then be chosen. A feasibility model will demonstrate the results of the research in the four areas mentioned above.

Contact Point

Mr. M. Caprace
SAIT ELECTRONICS S.A.
Chaussée de Ruisbroek 66,
B - 1190 BRUSSELS

Tel: +32/2-3705352
Tlx: 21601
Fax: +32/2-3766873

Participants	**Country**	**Role**
SAIT	*B*	*M*
BRITISH TELECOM INTERNATIONAL	*UK*	*P*
UNIVERSIDAD POLITECNICA DE CATALUNYA	*E*	*P*
UNIVERSIDAD POLITECNICA DE MADRID	*E*	*A*

Start Date: 01-JAN-89 *Duration: 36 months*

CONSTRUCTION AND MANAGEMENT OF DISTRIBUTED OPEN SYSTEMS (COMANDOS)

PROJECT NUMBER: 2071

The development of application software is currently a labour and cost-intensive proposition, especially for distributed applications. The overall objective of the COMANDOS project is to help facilitate the construction of large-scale, multivendor, distributed open systems by providing an integrated applications support environment for programming and using distributed applications which can manipulate long-lived data. The COMANDOS project is targeted at loosely coupled distributed systems of workstations, servers and processor pools, using internets based primarily on LANs.

The construction of such a platform requires the integration of three key aspects: operating systems, data management, and programming languages. We believe that the optimum mechanism to achieve this integration is to adopt an object-oriented approach for the operating system support, which can be exploited by data management systems, and which can be integrated with programming language environments. Intrinsic components of the platform are administrative tools to manage the operation of an installed system, and user-interface generation tools to aid the development of interactive applications.

This project is planned to last four years and will build upon the experience drawn from ESPRIT-I COMANDOS, a three-year project which was mainly dedicated to the exploratory prototyping of the platform. A number of significant achievements have already been reached and demonstrated in this project, and based on the results, a further consolidation and integration phase will allow the development of an integrated prototype of the platform (Release-1) at the end of the first year of ESPRIT II COMANDOS. Following a period of evaluation and revision, a full pre-industrial prototype of the platform (Release-2) will be provided at the end of the third year. In parallel, Release-1 will be used as an experimental basis for the construction of extended facilities (mainly a distributed directory service, and on-line management facilities) and for the development of a real-world application in the office area. The fourth year of the project will be mainly dedicated to consolidating and enhancing the pre-industrial prototype, including the integration of various facilities already developed on top of Release-1.

The industrial partners involved in the project are considering COMANDOS as a platform for the European IT industry to develop, on the one hand, easily portable distributed applications, and on the other hand, to support the coexistence of old-style (UNIX-oriented) applications. The result of the COMANDOS project will provide an increased level of harmonisation and consistency within the European market. Introducing the COMANDOS platform for the development of distributed applications leads to a significant increase in productivity and competitiveness. This is especially valuable because the wide range of products produced by the various industrial companies lack common functions as well as homogeneity at the basic operating system level. Therefore the results of the COMANDOS project will strongly influence the future development of software products in a number of market segments.

The current ISO Open Distributed Processing (ODP) work item is at present considering a computational model for co-operative distributed processing. COMANDOS aims to accommodate and provide inputs to these efforts. In particular, implementation experience would be a valuable input to the standardisation process.

The three main European manufacturers involved in COMANDOS are also members of the Open Software Foundation (OSF). The COMANDOS kernel as an extension of a UNIX kernel and the COMANDOS platform as an environment for distributed applications development can be considered as major contributions to the OSF.

Contact Point

R. Balter
BULL RESEARCH CENTER
Imag Campus BP 53X
F - 38041 GRENOBLE CEDEX

Tel: +33/76-544912
Tlx: 320 245
Fax: +33/76-547615

Participants	**Country**	**Role**
BULL	*F*	*M*
TRINITY COLLEGE DUBLIN	*IRL*	*P*
NIXDORF	*D*	*P*
INESC	*P*	*P*
SIEMENS	*D*	*P*
ARG	*I*	*A*
CHORUS SYSTEMES	*F*	*A*
LABORATOIRE DE GENIE INFORMATIQUE	*F*	*A*
CNET-SEPT	*F*	*A*
UNIVERSITÄT STUTTGART	*D*	*A*
UNIVERSITY OF GLASGOW	*UK*	*A*
UNIVERSIDAD DE CATALUNYA	*E*	*A*
FRAUNHOFER INSTITUT	*D*	*A*

Start Date: 01-MAR-89 *Duration: 24 months*

HARMONISED EUROPEAN CONCEPTS AND TOOLS FOR ORGANISATIONAL INFORMATION SYSTEMS (HECTOR)

PROJECT NUMBER: 2082

The overall objective of the project is to establish a basis for the European standardisation of concepts and tools for the analysis, design, implementation and evaluation of organisational information systems.

There is a common perception that few adequate tools exist to assist the implementation of Integrated Information Systems (IIS) through tapping knowledge domains such as the analysis of environmental business factors, computer-based planning and design methods, human factors approaches, etc. It is also often said that those tools which do exist are incomplete. Assuming those perceptions are correct, there are clearly opportunities for enhancing the effectiveness of IIS implementations throughout the Community by introducing common, comprehensive support tools. This one-year project will use a combination of market surveys and research to determine what tools are necessary and what tools already exist.

Specific objectives of the project are:

- To determine the state of the art with respect to concepts, tools, methods, procedures and methodologies for the analysis, design, implementation and evaluation of integrated organisational and office support systems.

- To develop and test a reference model that will identify the different aspects of the methodologies found above, and the different environments in which they might be applied. As a first step the reference model will be a catalogue of characteristics of different methods, uses to which office information technology might be put, and organisational constraints and environments; as a second step attempts will be made to relate methodologies to different organizational environments and applications.

- To establish the goals of the European harmonized methodology; this will include determining the performance criteria that the concepts, tools and methods should satisfy with respect to the analysis, design, implementation and evaluation of office support systems. These criteria will be sensitive both to application domains and organisational environments.

- To define what is required to ensure effective and acceptable concepts, tools and methods for the analysis, design, implementation and evaluation of integrated organizational and office information systems.

The project will cover important and innovative scientific and technical topics, such as computer-based IT engineering, knowledge engineering, and the development of expert systems; requirements analysis and design of future-oriented integrated office information systems; and computer and media-based training systems. For all of these topics progress will be made beyond the current state of the art. There are several links to other ESPRIT work areas, such as, for

example, the development of new IT equipment and expert systems. The applicability of HECTOR products will be guaranteed by the fact that the project design evolves from practical experience of analysts' and designers' needs.

The results of this project will be of direct value to those who are responsible for the analysis, structuring and implementation of IIS. HECTOR will promote a closer understanding of user organisation requirements, suitable organisational structures for information management, and needs with regard to the development of general curricula and teaching materials. The urgency of the HECTOR projects derives from the users' and vendors' need to know the criteria that will determine the success of integrated office information systems, and project results will be disseminated Europe-wide both during and after the duration of the work. The project will outline the new standards required and will make recommendations as to how they should be developed. The project partners comprise European industrial vendor companies, consultancies, software houses and research institutions. All of them have great interest in developing, using and distributing the HECTOR results. The project will provide ESPRIT with recommendations for future tools and concepts development.

Contact Point

Dr. J. Niemeier
FRAUNHOFER INSTITUT FÜR
ARBEITSWIRTSCHAFT UND
ORGANISATION (IAO)
Nobelstrasse 12c
D-7000 STUTTGART 1

Tel: +49/711-6868655
Tlx: 721978
Fax: +49/711-6868679

Participants	**Country**	**Role**
FRAUNHOFER INSTITUT	*D*	*M*
CAP SOGETI INNOVATION	*F*	*P*
CRAI	*I*	*P*
DELGA INTERNATIONAL S.A.	*E*	*P*
DORNIER GMBH	*D*	*P*
PEAT MARWICK McLINTOCK (PMM)	*UK*	*P*
PA CONSULTING GROUP	*UK*	*P*
IOT	*D*	*A*
BIFOA	*D*	*A*

Start Date: 01-MAY-89

Duration: 12 months

STRUCTURED INFORMATION MANAGEMENT, PROCESSING AND RETRIEVAL (SIMPR)

PROJECT NUMBER: 2083

The SIMPR project will lead to advances in information storage and retrieval systems, and to the development of techniques for the management of text stored in very large information banks. The main stages of the project are:

- Research into techniques for automatic indexing, text and language analysis. Specification of index rules for, and development of, an automatic, application-independent and language-independent indexing system.

- Research into subject classification methodologies. Design, development, and evaluation of an expert system to classify texts according to a subject taxonomy.

- Design and development of special-purpose software support tools for information-bank maintenance. Evaluation of the prototype system against conventional information/text-retrieval systems, using real application information sets.

- Research into domain and task modelling using information from design databases and domain structures, and analysis of text structures. using domain models to browse and retrieve texts, and by applying SIMPR text indexing to task structures.

The project will run for 3.5 years, and involves a broad range of partners, including an academic and a commercial partner from an EFTA country. It brings together commercial expertise in software development, information retrieval, and knowledge processing, with academic and research expertise in library science, information science, interface design, computer-aided design, and artificial intelligence.

This breadth of experience and competence will develop new techniques for the semi-automatic indexing of technical texts. Initially these techniques will be implemented as coherent modules within existing IR systems. Analysis of these techniques and of the results they generate will lead to development of semi-automatic information structuring techniques, and these will form the basis of the system for creation, validation and management of large information banks.

The SIMPR project will build on:

- Existing IR software, including state-of-the-art features for Boolean search, use of thesauri, implementation of controlled terminologies.

- Software for syntactic analysis of texts, with the capacity to decompose texts written in all major European languages.

- Prototype software for automatic indexing of texts.

- AI techniques for subject analysis, based on library systems for information subject classification.

The expected products from the project will thus occur during the project, not just at its termination. They will include:

- Information indexing techniques, for use with existing IR systems. These techniques will represent an advance on the current technique of file inversion, offering greater accuracy of retrieval and physically smaller indices.

- Information modelling techniques, enabling the author of an information bank to impose different structures on it depending on different user requirements, and to retrieve information by tracing a path through a selected model.

- Techniques to map commonalities between textual information and information contained in databases for CAD systems.

The final output of the project will be a system for creating and managing large information banks, such as an authoring system for CD-ROMs. It will resemble a hypertext system in its ability to link items of information at different levels, but it will aid the user by establishing such links automatically according to a subject analysis of the texts and by conformance with user-specified information models.

Industrial application areas in which products could be developed to use this system and its component techniques include:

- Software for authoring CD-ROMs, and for constructing a graphics interface to guide the reader through them.

- Software for indexing and structuring large textual information banks, such as technical manuals.

- Software for automatic indexing of documents destined for storage in technical archives.

Contact Point

Mr. G. Schmeltz Petersen
CRI A/S
Bregnerroedvej 144
DK - 3460 BIRKEROED

Tel: +45/2-822100 x6034
Tlx: 16066
Fax: +45/2-821766

Participants	**Country**	**Role**
CRI A/S	*DK*	*M*
NOKIA RESEARCH CENTRE	*SF*	*P*
PANDATA	*NL*	*P*
UNIVERSIDADE CATOLICA PORTUGESA	*P*	*P*
STRATHCLYDE UNIVERSITY	*UK*	*P*
UNIVERSITY COLLEGE DUBLIN	*IRL*	*P*
UNIVERSITY OF HELSINKI	*SF*	*P*

Start Date: 01-JAN-89

Duration: 42 months

METROPOLITAN AREA COMMUNICATION SYSTEM (MAX)

PROJECT NUMBER: 2100

The aim of the project is to provide an innovative, efficient and cost-effective solution to the communication needs of heterogeneous business users distributed over large (ie. metropolitan) areas with a high concentration of information-based organisations.

The major objectives are the definition, design, prototype development and testing in a real environment of a communication system for the flexible provision of basic and enhanced services and the support of multi-megabit applications, such as LAN-to-LAN linking, mainframe-to-mainframe communications, rapid transfer of high-resolution images, and audio and video communication and conferencing. MAX will be equipped with an advanced management system for configuration, operation, maintenance and security and will be based on the OSI architecture, with the use of relevant existing or emerging standards. Architectural concepts already developed in ESPRIT-I projects, eg. project 169 (LION: Local Integrated Optical Network), will be further expanded to satisfy the new and extended requirements; moreover, available European technologies will be exploited. The project consortium will also assess the technical and market opportunities for incorporating in the MAX design emerging standards related to Asynchronous Transfer Mode (ATM) and Synchronous Digital Hierarchy (SDH).

Current related commercial systems (eg. System Finex from Fibronics, Pronet 80 from Proteon) are not suitable to cope with the twofold requirement of covering a metropolitan area (well beyond the local environment) and integrating communication services. The state of the art is represented by laboratory prototypes of fibreoptic-distributed networks working in the 100 Mbit/s range (eg. LION, Metrocore).

The awareness of the potential market for multiservice business networks (estimated by companies in the MAX consortium to be greater than 1000 MECU in Western Europe in 1995), has led, quite recently, to studies and standardisation activities worldwide: noticeable examples of this trend are the Fibre Distributed Data Interface II (FDDI-II) and the Distributed Queue Dual Bus (DQDB) proposals.

The novelty of MAX can be found not only in the specific technical choices for the different subsystems (e.g. use of high-speed electronic and optical components, single-mode optical fibres, design and development of gate arrays, definition of advanced multiprocessor architectures and software systems) but, above all, in the overall system features, capable of providing integrated data, voice and video services at 600 Mbit/s and, in a second step, in the Gbit/s range.

The project, whose strategic impact and complexity has required a plan covering five years' work, is split into two phases of 2.5 years each. Major results of Phase I, which will start with the definition of the global system, will be the specification, design and development of HW/SW prototype modules for the main building blocks of the network. During Phase 2 those modules will be completed, refined and assembled into a network supporting pilot applications.

The project consortium, where the manufacturing companies represent about 45% of the manpower, will define a set of industrial and commercial actions,

including: turnkey communication systems, network products, installation technologies and cabling systems, HW chips, high-speed communication servers, and improved communication protocols and network management systems. The expected project results are in line with the strategies of the companies involved. In particular, the reproduction of MAX nodes is foreseen, during the last year of Phase 2, for two real-environment network demonstrators. These represent field-trials to be installed in selected areas, connecting a wide variety of real users and directly involving the operating companies.

To promote a favourable market impact, widen the application field and reach a broad level of user acceptance, the project will participate in the development of new standards, with active contributions to CEN/CENELEC, CCITT and IEEE.

Contact Point

Mr. A. Luvison
CSELT
Via G. Reiss Romoli 274
I-10148 TORINO

Tel: +39/11-2169803
Tlx: 220539
Fax: +39/11-2169520

Participants:	**Country**	**Role**
CSELT	*I*	*M*
SIRTI	*I*	*P*
TITN	*F*	*P*
KTAS	*DK*	*P*
NKT	*DK*	*P*
BRITISH TELECOM	*UK*	*P*
HEWLETT PACKARD	*UK*	*A*
L-CUBE	*GR*	*A*
DNAC	*F*	*A*
3IT	*F*	*A*
UNIVERSITY OF PATRAS	*GR*	*S*

Start Date: 10-APR-89

Duration: 30 months

STANDARD FOR CODING OF MOVING IMAGES ON DIGITAL STORAGE MEDIA (COMIS)

PROJECT NUMBER: 2102

COMIS aims to define an efficient coding algorithm and a conceptual design of the LSIs which would allow implementation of a simple decoder for office and home applications, capable of accessing moving-image information recorded on a variety of digital storage media and with a transfer rate of up to 1.5 Mbit/s. The availability of a standard for this bit-rate range would spur a wide range of applications in different areas, such as in entertainment, education, and training, as well as in the office. Image coding for digital storage media at this bit-rate has received little attention to date, mainly because research has been motivated primarily by telecommunication needs, where real time is of course the main constraint.

Two pioneering developments are known: DVI, originally developed by the David Sarnoff Research Laboratoriess of RCA, now a part of Intel; and CD-I, of Philips-Sony. The COMIS project, however, aims at improving the existing picture quality, a goal that the proposers believe to be feasible, as attractive quality at 1.5 Mbit/s is being demonstrated at some European laboratories. The hardware producing it, however, is very bulky, because very little VLSI is being used, the target domains are coding and decoding applications, and the possible non-real-time operation of the encoder is not taken into account.

The project will work in synchrony with the ISO's DAPA (Digital Audio and Picture Architecture) standardisation project. This project will define the coded representation of Still, Binary and Moving Pictures, Computer Graphics and Audio. For Still Pictures, the standard will be ready by February '89 and will be based on the results of ESPRIT project 563 (PICA: A High Compression Picture Coding Algorithm for Photographic Videotex).

COMIS intends to provide the same coordination framework for European participation in ISO that proved to be so successful for PICA; an important aspect, since it is known that a national Japanese project has been launched on this subject with the participation of major electronics companies. The LSI aspect, which is also covered by COMIS at the level of conceptual design, is very important, as once a standard has been defined, hardware and software products will be needed immediately. Working with leading IC manufacturers in the Community will give enhanced credibility to European proposals in ISO and will eventually give the European industry the chance of successfully winning over the competition.

The objectives of the project are the full definition of the algorithm for efficient coding of moving pictures for digital storage media and the conceptual LSI design of the decoder.

The exploitation potential of the project results can be estimated from a few examples of possible applications: motion pictures for entertainment, moving images in a sales catalogue, moving images in a video course or training course, moving images for educational purposes, and moving images complementing a multimedia encyclopedia.

The partners in this project intend to exploit the results according to their specific areas of interest: the IC companies will manufacture the VLSI defined by the project; the consumer and professional electronics companies will manufacture multimedia workstations or consumer-oriented products which include full-screen moving images; and telecommunications companies will favour the introduction of the digital video technology developed by the project into multimedia terminals (eg. for videoconferencing and videotelephony) for the digital network.

Contact Point

Leonardo Chiariglione
CSELT
Via Reiss Romoli 274
I - 10148 TORINO

Tel: +39/11-2169228
Tlx: 220539
Fax: +39/11-2169520

Participants	**Country**	**Role**
CSELT	*I*	*M*
BRITISH TELECOM	*UK*	*P*
CNET-FRANCE TELECOM	*F*	*P*
DEUTSCHE THOMSON BRANDT GMBH	*D*	*P*
INMOS	*UK*	*P*
ITT INTERMETALL	*D*	*P*
PHILIPS RESEARCH LABORATORIES	*UK*	*P*
TELENORMA	*D*	*P*
THOMSON/LER	*F*	*P*
EIKON S.P.A.	*I*	*A*
PHILIPS-LEP	*F*	*A*
UNIVERSITÄT HANNOVER	*D*	*S*

Start Date: 01-MAR-89 *Duration: 27 months*

MULTI-ENVIRONMENT ADVANCED SYSTEM FOR COLOUR TREATMENT (MASCOT)

PROJECT NUMBER: 2103

The project deals with the development of sophisticated and advanced technology equipment, methods and software techniques, which make it possible to pick up, process and produce colour images well suited to cover most of the present and future needs in multiple application environments.

Project activities dealing with hardware development will be carried out making full use of European basic technologies, including design on silicon. The main part of the project, dealing with software development, will cover the areas of advanced desktop publishing and office document handling and will be based on the implementation of true colour plus a 3D extension of the image model of PostScript, complying with available international standards.

The project is planned to cover 2 years and products of industrial interest could be generated in the following areas:

- Hardware Basic Components and Supplies

  Those identified include colour-integrated area sensors for information compression/decompression; optical lenses for acquisition system and supplies; and toners and photoreceptors for printing systems.

- Peripherals

  The multipurpose, multi-environment professional colour acquisition system and the low-cost photostatic printer which will be developed and demonstrated before the end of this activity could represent industrial outcomes of this project.

- New Standard Proposals

  The 3-D extension of the image model of PostScript, methods for device-independent definition of colour images in PostScript, and the metalanguage, whose syntax will be embedded in PostScript and by which the structure of the document may be preserved into the source of the Postscript file, could certainly represent evolutions and extensions of already available standards.

- Application Software

  Making use of the features provided by the PostScript extensions and by the PostScript-mapped metalanguage will lead to the availability of more effective and powerful DTP and technical office applications.

- Workstations

  The hardware and software tools integrated in an already available computer system, equipped with proper peripherals and defined according to the peculiar market requirements of the companies involved, could represent the basis for the evolution of currently available equipment.

Contact Point

Mr. G. Coli
OLIVETTI
Via Jervis 77
I - 10015 IVREA (TO)

Tel: +39/125-521492
Tlx: 210030
Fax: +39/125-521468

Participants	Country	Role
OLIVETTI	*I*	*M*
IMPERIAL CHEMICAL INDUSTRIES PLC	*UK*	*P*
THOMSON TMS/DES	*F*	*P*
KATHOLIEKE UNIVERSITEIT LEUVEN	*B*	*A*
COMPUTER LOGIC S.A.	*GR*	*A*
HITEC LTD	*GR*	*A*
OPTEC SRL	*I*	*A*
PAUL SCHERRER INSTITUTE	*CH*	*A*
G45 RICERCA SPA	*I*	*A*
KERN	*CH*	*S*
SOFTWARE SISTEMI	*I*	*S*

Start Date: 01-JUN-89

Duration: 24 months

MULTIWORKS (MULTIWORKS)

PROJECT NUMBER: 2105

MULTIWORKS is a low-cost, integrated multimedia workstation for the office of the future. It will be based on European technology and comply with international standards.

Full use will be made of high-performance European RISC technology and design-on-silicon techniques. MULTIWORKS also uses European technology for its operating system, AI environment and applications.

The project has a good mix of large and small companies. It is planned to cover 4 years, with significant results becoming available as spin-offs to the companies involved during the duration of the project, rather than just at its end.

The main purpose of MULTIWORKS is to show that advances in RISC technology and software integration can combine to produce a workstation which significantly increases office productivity. Thus it addresses one of the main growth markets of the 1990s.

The low cost of MULTIWORKS is essential to the project and will influence the extent to which certain features will be integrated. The second generation RISC chipset to be developed in this project will produce significant improvements in processor architecture, and speed of execution will be substantially increased by access to state-of-the-art VLSI technology.

The software MULTIWORKS runs is UNIX-based and will adhere to international standards. The objective of the software architecture is to provide good real-time support for all hardware devices and to provide an object-oriented platform for multimedia documents and hypertext information systems. Since the key applications deal with documents in the widest sense, a multimedia editor, OCR, script recognition and support for 3-D and hypertext will be developed.

The combination of these new features with advances in user-interface design will produce a significant increase in user-friendliness and thus usability of the system compared with comparable products currently on the market.

The partners think that there are common industrial benfits that can be derived from the MULTIWORKS project, divided into six specific areas that could generate products:

- Workstations

  It is believed that the industrial outcomes of this project will be organised in the participating companies in the form of a specific product strategy for office applications, covering either some or all of the areas concerning development, marketing, service and support, as well as international promotion.

- Basic Hardware Components

  Basic hardware components (the RISC chipset, integrated VLSI circuits for peripherals, and communication and mass storage controllers) can be manufactured and used with the agreement of one or more of the hardware supplier partners of the consortium.

- Hardware Add-ons

  This aspect of product development will be managed by individual partners according to their specific areas of involvement. However, particular deals could be established between the partners to integrate the add-on features in their standard products. This will be made easier by the common choice of architecture and standard interfaces.

- Operating System

  This activity can be conducted separately from the hardware. Indeed, the assured compatibility with a widely used standard such as UNIX will contribute to building up an extended interchangeable number of advanced applications.

- Knowledge-Engineering Tools

  The intention is for the small software companies involved in the project to establish a marketing deal with the larger participating companies. Possibilities are obvious for the direct exploitation by all interested partners of the developments in this field, through porting them to appropriate present or future products.

- Hypermedia and Multitalk

  The intention is to impose an industry standard that is accepted internationally, making this an obvious area of exploitation for the different companies involved.

Contact Point

Mr. G. Fogaroli
OLIVETTI
Via Jervis, 77
I-10015 IVREA (TO)

Tel: +39/125-525461
Tlx: 210030
Fax: +39/125-521966

Participants	**Country**	**Role**
OLIVETTI	*I*	*M*
AEG OLYMPIA	*D*	*P*
AEG AG	*D*	*S*
BULL	*F*	*P*
ICL	*UK*	*P*
ARG	*I*	*S*
SGS THOMSON	*I*	*A*
ACORN	*UK*	*A*
TRIUMPH ADLER	*D*	*A*
CHORUS	*F*	*A*
HARLEQUIN	*UK*	*A*
PHILIPS KOMMUNIKATIONS	*D*	*A*
PHILIPS COMPONENTS	*NL*	*A*
POLYTECHNIC OF CRETE	*GR*	*S*
GMD	*D*	*S*
INPG	*F*	*S*
INRIA	*F*	*S*
TECNOPOLIS CSATA NOVUS ORTUS	*I*	*S*
TELESYSTEMES	*F*	*S*
PHILIPS LEP	*F*	*S*

Start Date: 09-JAN-89

Duration: 22 months

TELEMATIC OBJECT-ORIENTED TOOLS FOR SERVICES INTERFACES (TOOTSI)

PROJECT NUMBER: 2109

The aim of the project is to design and implement a set of software tools for applications dealing with remote on-line services (eg. electronic Yellow Pages, business information, library services, and data-banks of all kinds).

These tools will allow the development of applications, on a standard low-cost workstation, with the following features:

- the same interface style across several services (also across national boundaries)
- the same data model to access several services (also across national boundaries)
- a global directory, to allow browsing through descriptions of several services
- integration with local application packages (spreadsheets, word-processors, databases, etc.)
- use of graphics features
- advanced services management (accounting, security, etc.).

Moreover, special integration techniques must be used, as the common applications frame can only be set up at the remote user level (ie. on the user workstation). This is because changes cannot be made directly on the services concerned, due to their extreme heterogeneity and to the high number of different service providers.

The language proposed for the implementation of these applications will have advanced 4GL-like features; and it is conceivable that development time for these applications may be cut to one-tenth with respect to the current situation.

This is a 3-year project and a final workpackage is envisaged where all the TOOTSI tools will be used to implement three applications that will validate the system in three different telematic environments.

This project has a strong commercial potential: it is well known, for a number of related reasons that TOOTSI aims to address, that the use of remote services has been much lower than expected and needed.

The partner profile means that the project results are likely to lead to industrial implementations in the short term. In particular, SARIN, Telesystemes and INFOTAP (already with a strong involvement and experience in the field) intend to improve their information services, incorporating the output from TOOTSI into their marketing plans. Desarrollo de Software will include parts of the results as extensions of its office automation products.

Contact Point

Mr. Gregorio Lella
SARIN
S.S. Pontina Km. 29,100
I-00040 POMEZIA

Tel: +39/6-91197512
Tlx: 616436
Fax: +39/6-91197600

Participants	Country	Role
SARIN	*I*	*M*
TELESYSTEMES	*F*	*P*
DESARROLLO DE SOFTWARE	*E*	*P*
INFOTAP	*L*	*P*
ARG	*I*	*A*
OLIVETTI	*I*	*A*
POLITECNICO DI MILANO	*I*	*A*
SOPHIATEC	*F*	*A*
UNIVERSITE DE NICE	*F*	*A*
ALGOTECH SISTEMI	*I*	*A*
CENTRO A. VOLTA	*I*	*A*

Start Date: 01-FEB-89

Duration: 36 months

PLANNING OF NON-SPECIFIC TRANSPORTATION BY AN INTELLIGENT FLEET EXPERT (PONTIFEX)

PROJECT NUMBER: 2111

The PONTIFEX project's principal aims are to develop a knowledge-based decision-support system in the routing and scheduling problem domains, and to demonstrate its applicability in the area of commercial transportation. A breakthrough in state-of-the-art technology can be achieved by combining Operations Research and Artificial Intelligence methods and techniques.

Representing the full complexity of real-world routing and scheduling problems by means of mathematical models which have effective algorithmic solutions is sometimes impossible to accomplish. Not only does the mathematical formulation often lead to problems of the NP-hard complexity class, but also the real-world situations almost always present aspects which evade mathematical structuring. In general, a routing and scheduling problem is thus best tackled by way of a human-machine interaction where (a) the machine is capable of data-, models-, and dialogue management (a Decision Support System, DSS), and (b) the human is both familiar with the relevant Operations Research (OR) outfit and knowledgeable in the specific domain of application. PONTIFEX is a DSS usable by OR-naive users, and it will therefore have capabilities for building models and for automatically activating solution procedures and algorithms upon receiving the user's problem description. This implies that (1) the DSS must be knowledge-based, and (2) model description must be divorced from model solution.

A functional layout of such a system has been conceived, and a demonstrator prototype is being built, which link two seemingly divergent approaches: the knowledge-based way, and the structured algorithmic way, which had long been studied separately by some project partners. Both approaches have drawbacks when used in isolation: it is unproductive to entrust inference engines and/or logic programs with the solution of complex algorithms, and it is impossible to tackle certain real-world (routing and scheduling) problems by means of a pure specify-then-build approach.

A general purpose planning tool which integrates Artificial Intelligence and Operations Research methods is the major objective for those project partners who are directly involved in information technology. Also, a PONTIFEX fully-functional prototype under standard UNIX will be validated in two user environments on a specific application: aircraft rotation and scheduling.

The potential European target market (airlines, shipping, mass transit, pick-up and delivery, and transport-related services) was generating a turnover of some 150 000 MEcus in 1986.

Contact Point

Dr. Paolo Magrassi
NIXDORF COMPUTER S.P.A
Centro Direzionale Lombardo
Palazzo A
Via Roma 108
I - 20060 CASSINA DE' PECCHI (MI)

Tel: +39/2-95121589
Tlx: 320066
Fax: +39/2-95121585

Participants	Country	Role
NIXDORF	*I*	*M*
ALITALIA	*I*	*P*
O. DATI ESPANOLA	*E*	*P*
PANDATA	*NL*	*P*
CNR/IASI	*I*	*A*
TAP AIR PORTUGAL	*P*	*A*
TRADEMCO	*GR*	*A*
SIPE OPTIMATION	*I*	*S*
TRUT	*GR*	*S*
O. GROUP	*I*	*S*

Start Date: 01-MAR-89

Duration: 48 months

LARGE SIZE VISUAL INTERFACE DESIGN FOR MULTIMEDIA WORKSTATION TERMINALS (LSVI)

PROJECT NUMBER: 2114

LSVI is a low cost, high performance, large size, full-colour visual interface based on combining three monochromatic images formed on the screens of CRTs and their rear projection by a single-lens system onto a viewing screen.

This approach enables the visual interface to cope with sizes up to A1 (0.5 m2), featuring full-colour, high resolution, high brightness, and good contrast projected images. A wide range of applications exist where the visual presentation of data is important (eg. graphics and 3-D presentation of information).

The LSVI project will contribute to and have an impact on the visualisation of computer-generated data. It is based on European technology and will conform to existing standards, as well as contributing to the development of new international standards.

The main goal of the LSVI project is to demonstrate the visual interface through advanced developments in:

- Electronics
    - processing of broadband video signals at high voltage
    - deflection circuits at high deflection frequencies to meet resolution requirements and to reduce power consumption
    - stable convergence and correction of geometrical distortion
- CRT Technology
    - improvements in the overall luminous efficiency of the screen
    - improving faceplate curvature for more efficient optics
    - interfacing faceplate cooling facilities with projection optics devices
    - shorter high current and enhanced resolution electron optics design

- Projection Optics
    - optimisation of the CRT/optics interface
    - design of an efficient and compact combiner
    - design of a single compact magnifier
    - shortening the optical path
- design of a viewing screen with good optical gain.

This project is being carried out by three competent large industrial companies with qualified experts. Close cooperation between high performance CRT specialists, optics professionals and electronics experts greatly increases the potential for improvement of electro-optical performances and for compactness. In fact, significant subgoal results can already be foreseen for the 3-year planned duration of the first project phase.

The partners have already identified some potential application areas for large size visual interfaces:

- science engineering
- earth sciences
- medicine
- industry
- telecommunications/business/administration/office systems
- entertainment consumer electronics
- avionics/ATC/defence/military systems
- workstations.

The partners envisage that the results of the LSVI project will lead to a common industrial project addressing a high-performance visual interface for multimedia workstations and the manufacturing of basic hardware components.

Contact Point

Dr. M.H. Florjancic
SEL-RESEARCH CENTER
Holderäckerstr. 35
D - 7000 STUTTGART

Tel: +49/711-8692249
Tlx: 72194 - 0
Fax: +49/711-869.2185

Participants	**Country**	**Role**
SEL	*D*	*M*
PILKINGTON	*UK*	*P*
THOMSON	*F*	*P*

Start Date: 01-JAN-89

Duration: 36 months

INTEGRATED TOOLKIT FOR HIGHLY ADVANCED COMPUTER APPLICATIONS (ITHACA)

PROJECT NUMBER: 2121

The aim of the ITHACA project is to develop an integrated application support system based on the object-oriented programming approach. Object-oriented systems of the type envisaged incorporate a wide range of features (such as data encapsulation, data abstraction and inheritance) which guarantee a high application quality and ensure reusability on a large scale. In addition to the advantages to be gained from this approach, the use of existing and foreseeable standards will play a decisive role, offering numerous benefits for all parties involved in the application development process.

The underlying objective is to create a platform that will enable a wide range of applications to be developed quickly, reliably and at low cost. This approach is reflected to some degree in a number of developments today, but as a result of its innovative nature and the leading-edge methods involved, has yet to gain a firm foothold in the market.

The system will consists of the following components:

- Object-oriented kernel
- Evolving object-oriented software base
- Applications development environment
- Applications support environment.

The object-oriented kernel will incorporate the programming language, the compiler, run-time support features for the objects, and the integrated database support facility. The software base will be geared specifically to the respective applications and will be upgraded as new applications are perfected. It will incorporate a generic office model for reuse by other applicatiosn and will be based on an intergrated and distributed multimedia environment. The application development environment will consist of a set of tools aimed at aiding the application programmer in specifying requirements and in modeling the application under development. Particular consideration will be given to providing support for an object-oriented life-cycle geared towards streamlining the configuration process called for by the applications. In addition, the application development tools will provide assistance when designing the objects specified by the respective applications and when selecting pertinent objects from the current software base; they will support the development of any new objects required and will prove helpful at the individual configuration phases. The application support environment will provide application users with an advanced user interface, an activity coordination facility, and a management system.

Two procedures will be employed to validate the environment. First, a bootstrap technique will be used to develop the entire system in a single unique language, with the aim of proving that the environment is suitable for system programming. Second, several applications will be developed to illustrate the usefulness of the

environment for the applications development.
Unlike other development on the market, ITHACA is not aimed at creating niche applications geared wholly for use in dedicated environments. Rather, the focus is on achieving a high level of openness on an object-oriented level with the aim of providing comprehensive support for object-oriented software development methods.

The partners involved in the project are established, competent and experienced computer manufacturers, software houses, users and reputable academic institutions. As founding members of the Open Software Foundation (OSF), Nixdorf and Bull foresee a high level of integration of the project results into the activities of this organisation, thus guaranteeing that standards - a vital concept in view of the demand for openness and reusability in the field of information technology as a whole - are laid down and implemented to the greatest possible extent.

Contact Point

Mrs. A. K. Pröfrock
NIXDORF SOFTWARE ENGINEERING GMBH *Tel: +49/30-46007122*
Voltstrasse 1 *Tlx: 185452*
D-1000 BERLIN 65 *Fax: +49/30-46007105*

Participants	**Country**	**Code**
NIXDORF	*D*	*M*
BULL	*F*	*P*
CAP SESA INNOVATION	*F*	*P*
DATAMONT	*I*	*P*
FOUNDATION OF RESEARCH & TECHNOLOGY	*GR*	*P*
TAO	*E*	*P*
UNIVERSITE DE GENEVE	*CH*	*P*
FORSCHUNGSZENTRUM INFORMATIK	*D*	*A*
TRINITY COLLEGE DUBLIN	*IRL*	*A*
INRIA	*F*	*A*
DELPHI	*i*	*a*
CMSU	*GR*	*A*
E2S	*B*	*A*
POLITECNICO DI MILANO	*I*	*S*
UNIVERSITA DI MILANO	*I*	*S*
D-TECH	*GR*	*S*

Start Date: 09-JAN-89 *Duration: 12 months*

INFORMATION TECHNOLOGY UPTAKE SUPPORT ENVIRONMENT (IT-USE)

PROJECT NUMBER: 2144

The importance of human and organisational factors in the IT uptake process is generally recognised, but real understanding of these issues is confined to behavioural scientists, who are generally isolated from the main body of IT practitioners.

This project aims to demonstrate that complex domains of behavioural science expertise can be presented in an interesting way, and to facilitate the transfer of this knowledge to a wide range of IT professionals and user organisations via a technology-based Uptake Support Environment, or IT-USE.

A substantial knowledge-base exists which addresses:

- human and organisational factors in IT uptake processes in user organisations
- transformations in the design of work and organisations through IT uptake and possible implications for quality of working life, including training for IT uptake
- user aspects of hardware and software, particularly the usability and acceptability of IT products and applications;
- methodologies for the design and implementation of IT application systems in user organisations;
- the strategic/competitive importance of IT uptake as a component of business planning, and especially of organisational innovation for competitiveness.

This project will integrate a number of leading-edge aspects of IT (interactive video, a comprehensive knowledge base made up of text/graphics/animated graphics/live drama/audio, and an expert systems interface to the user) as a means of storing, structuring and presenting this complex behavioural science knowledge to users of IT-USE.

The project brings together a variety of theoretical and practical expertise to deliver a high quality prototype having the potential to promote a significant increase in the rate at which IT systems are integrated within the day-to-day operations of end-user organisations.

The main deliverable from IT-USE will consist of an intelligent support environment containing a structured knowledge-base elicited from behavioural scientists and IT professionals, presented to the user in a manner which exploits the technical capability of interactive video and expert systems technology. The novel application of these technologies to aid the dissemination of information concerning complex, but highly relevant, domains of behavioural science will be an exciting product in its own right, as well as providing significant potential benefits to users of IT-USE.

The planned early industrialisation process will result in an increase in understanding of human and organisational factors in the IT uptake process, with a consequent expansion of the market for applications software, combined with an improved quality of exploitation of the functionality and potential of IT within user organisations.

IT-USE will have potential for penetrating large markets and be usable across a wide range of applications within many organisations, regardless of the business sector within which they operate. For this reason, it will function as an enabling technology, supporting the efficient integration of IT into applications systems.

Organisations participating in IT-USE have entered into an agreement under which a jointly owned European company (the exploitation company) will be formed to achieve maximum commercial exploitation of the final deliverable as soon as possible. In this way, participating organisations are committed to ensuring that the results of the project are industrialised and commercialised to the fullest extent.

Contact Point

Mr. J.B. Ennis
IRISH MEDICAL SYSTEMS
Suite 2
Blackrock Clinic — *Tel: +353/1-884454*
IRL - BLACKROCK, CO. DUBLIN — *Fax: +353/1-832989*

Participants	Country	Role
IRISH MEDICAL SYSTEMS	*IRL*	*M*
WORK RESEARCH CENTRE	*IRL*	*P*
FUTUREMEDIA	*UK*	*P*
COPENHAGEN BUSINESS SCHOOL	*DK*	*P*
GRONINGEN UNIVERSITY	*NL*	*P*
MEMORY COMPUTER	*IRL*	*A*
SCAITECH A/S	*DK*	*A*
DATACENTRALEN	*DK*	*A*
CELTECHNOLOGY LTD	*UK*	*A*
HEPTACON LTD	*UK*	*A*

Start Date: 05-DEC-88 — *Duration: 36 months*

DYNAMICALLY ADAPTABLE MULTISERVICE SYSTEM (DAMS)

PROJECT NUMBER: 2146

The DAMS project aims to develop an advanced communication system capability addressing the needs of the private communications market.

At present, the vast majority of voice and data services, both public and private, are catered for by separate networks which employ either circuit-switched or packet-switched techniques. The main objective of DAMS is to address the problems associated with the integration of these services within the business environment. DAMS will provide both time-dependent telephony services and time-independent data services in a fully integrated and cost-effective system which will fulfil relatively near-term customer requirements. It will implement and validate the system concepts outlined in work carried out under ESPRIT I and will also identify migratory paths necessary to support new services which will become available in the longer-term future.

The project has a good mix of large and small companies and universities. It lasts 3 years, and information gained during the course of the project will be fed back into industry on an ongoing basis so that the European companies concerned are able to take full advantage of the results of the project at the earliest possible opportunity.

The project will be based on and will comply with international standards, as well as making full use of the European ASIC technology capability.

The private communications market has traditionally been the driving force for the introduction of new services and facilities, and DAMS is seen as the next evolutionary step necessary to meet the considerable demand identified for advanced multi-media services, which cannot readily or easily be accommodated by current systems, but which will be required before the eventual introduction of the Integrated Broadband Communications Network (IBCN) in the late 1990s.

In order to cater for specific needs and evolving customer requirements, flexibility has been a major concern in the specification of the system. DAMS was designed around a modular architecture incorporating a variable number of subsystems, connected to a high-speed backbone ring. This will allow DAMS to interface to other existing local area networks so that customers will not lose their initial investment in these systems and will still be able to take advantage of new service developments. Dynamic allocation allows for efficient usage of the bandwidth and hence efficient system performance.

Major aspects of the work on the project will be directed towards the construction of a feasibility prototype, capable of being demonstrated on a suitable test site, and which will provide sufficient infrastructure and software support to enable validated concepts to be ported to a development environment for the early exploitation of a product.

The consortium of partners believe that the following areas of industrial interest can be identified:

- ISPBX/ISLAN

  The main outcome of the project will be the proving of the techniques which demonstrate the feasibility of an integrated system on which the participating companies can base the next generation of office communications products. Investigations by a marketing subcontractor showed that there would be a considerable demand for such a system both in Europe and elsewhere in the very near future.

- Hardware Components

  Hardware basic components in various areas will result. Planned examples are the extension of FDDI-1 to FDDI-2 and peripheral chips in the port units.

- Multiservice Terminals

  The project will support and hence promote the introduction and further penetration of multiservice terminals in the European arena. Terminal manufacturing companies will be encouraged to introduce novel terminals which can be supported by a DAMS system. This further provides a means for accelerating the introduction and acceptance of the next generation of IBCN-compatible services and systems.

Contact Point

Mr. W. Krautkraemer
T.N. TELENORMA — *Tel: +49/692-723235*
Mainzer Landstr. 128/146 — *Tlx: 413217*
D-FRANKFURT/MAIN — *Fax: +49/692-723315*

Participants	**Country**	**Role**
T.N. TELENORMA	*D*	*M*
JEUMONT-SCHNEIDER TEL.	*F*	*P*
STC TECHNOLOGY	*UK*	*P*
INESC-INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES	*P*	*S*
UNIVERSIDAD POLITECHNICA DE MADRID	*E*	*S*
UNIVERSITÄT KAISERSLAUTERN	*D*	*S*
UNIVERSITÄT STUTTGART	*D*	*S*
RWTH AACHEN (RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE)	*D*	*S*
UNIVERSITY OF PATRAS	*GR*	*S*

Start Date: 01-APR-89 — *Duration: 36 months*

A SET OF SOFTWARE TOOLS FOR A DOCUMENT WORKSTATION (SUPERDOC)

PROJECT NUMBER: 2170

The aim of the SUPERDOC project is to build a set of software tools for the efficient production of high quality documents in complex organizational environments.

It will develop precompetitive and innovative techniques in the field of document generation, exploiting some results of ESPRIT-I projects. Compatibility with industry standards (eg. ODA, ODIF), and integratability with existing office automation environments will be pursued. Real-life applications will be used to test the overall validity of the approach.

The project exploits two original ideas: the distinction between the notion of conceptual documents, where only the content is taken into account, and the notion of presentation, where the appearance of the document is taken into account; and the definition of schemas as very high level programs which can be used to generate documents. Particular emphasis will be given to the collection of data from existing applications and their merging in the document-generation process, as this aspect is not satisfactory covered by available tools.

The main objective is the development of a set of tools focusing on document generation and an IS interface, making direct reference to real application environments (eg. Italian banks, legal offices, etc.). From a marketing point of view, three basic strategies will be followed: the integration of a specific document generator into an existing database management system; a similar development but using instead an office automation package; and finally the development of specific applications incorporating the SUPERDOC tools.

Industrialization of marketing and product activities is guaranteed by the participation in the consortium of partners who are either big manufacturers or software companies with relevant shares in the target market.

Contact Point

Mr. Sergio Copelli
ARG SpA
Via Pio la Torre 14
I -20090 VIMODRONE (MI)

Tel: +39/2-2650072
Tlx: 353022
Fax: +39/2-2650693

Participants	Country	Role
ARG	*I*	*M*
INESC	*P*	*P*
EPSILON	*GR*	*P*
OLIVETTI	*I*	*A*
HONEYWELL-BULL	*I*	*A*
LOMBARDIA INFORMATICA	*I*	*A*
POLITECNICO DI MILANO	*I*	*A*
TESEO	*I*	*A*
SMD	*P*	*A*
ADDAX	*GR*	*A*
STRATEGIC	*GR*	*A*
FRT-HELLAS	*GR*	*A*

Start Date: 05-DEC-88

Duration: 36 months

RESEAU D'INFORMATION ET DE COMMUNICATION HOSPITALIER EUROPEEN (RICHE)

PROJECT NUMBER: 2221

RICHE is a comprehensive automation system for European hospitals. Two main areas of focus are envisaged:

- health care production management, especially health care services
- patient file management, especially support to all medical services available to the patient.

RICHE will be independent of local or national laws. It will be based on European technology and will comply with international standards.

The overall objective of the project is to develop a health service information and communication network for Europe.

More specific objectives include:

- the development of a European modular, functional data model
- the modelling of function, information, data, technology, and database organization aspects of the system
- prototyping and testing.

The project will qualify and integrate developments in earlier ESPRIT work or in ongoing ESPRIT projects, in accordance with the requirements of the health sector. These requirements include:

- wideband communications
- distributed systems architecture
- system portability
- universal, multimedia document architecture
- functional advanced workstations and
- high capacity, fast multimedia storage and retrieval.

Each of these elements will contribute to the establishment of the open, dynamic, modular and interchangeable architecture that is needed in Europe. In this context, a European functional, modular data model will also be developed and tested. Ultimately, the project will make an attempt to demonstrate the suitability of its products on at least two sites in different countries.

Project work is divided into three phases:

1. A study phase aimed at specifying the architecture of the RICHE information and communication system and the basic data model for distributed multimedia processing, consisting of a set of function, information data-class and technology models.

2. The development of the prototype, incorporating the medical process management, nursing care, primary health care and multimedia patient file system.

3. The installation and demonstration of the system in two European sites (the Netherlands and France).

The main objectives for all partners will be to generate European business on the basis of the experience acquired. The software companies will develop, market, install and maintain regional health service information systems. This will also be done on a larger scale in and outside Europe with the help of manufacturers.

Contact Point

Mr H. Mensch
CNEH/DII
7 Rue Pérignan
F - 75015 PARIS

Tel: +33/1-47838839
Fax: +33/1-42730744

Participants	**Country**	**Role**
STAF	*F*	*M*
BULL	*F*	*P*
ICL	*UK*	*P*
IMS	*IRL*	*P*
SIG	*NL*	*P*
UCSC	*I*	*P*
BAZIS	*NL*	*A*
IIRIAM	*F*	*A*
LOMBARDIA INFORMATICA	*I*	*A*
CNEH	*F*	*S*
GESI	*I*	*S*

Start Date: 01-JAN-89 *Duration: 36 months*

SELF-SERVICE FACILITIES ARCHITECTURE (SESEFA)

PROJECT NUMBER: 2239

An IT-based self-service facility is a workstation through which end-users can perform a number of operations that would otherwise require the intervention of specialized personnel. Self-service facilities find application in many domains, including banking, public administration and insurance.

SESEFA aims to design and develop a self-service system architecture and a set of development tools that will allow executive users with little knowledge of IT to develop self-service applications for end-user operation. SESEFA will develop a prototype demonstration system for banking applications, a sector which has already shown interest in the project results.

The consortium is made up of four companies, plus a university research group. They are united by their mutual long-term goal of developing the technology and production capability for installing and running automated business-oriented self-service systems. The project is planned to last 3 years, and to offer significant spin-offs for its participating companies throughout its duration.

Demand for business self-services is predicted to grow, following the trend for increased demand in the availability of business services generally. This demand will increase over the next few years, both in terms of service types and of round-the-clock service availability. Self-service is seen as the right solution to reduce costs and organization requirements in providing a wide spectrum of services. Currently, self-service is mainly provided through stand-alone workstations. However, to maximise their capabilities, self-service facilities should be part of an information system. In addition, self-service workstations, when introduced into a business environment, must be very flexible in order to allow for changes in service modes, the addition of new services and deletion of existing services, changes in visual representation, and so on.

The Object Oriented Programming (OOP) approach will be the unifying paradigm in SESEFA. This approach will be used for designing and developing both the system support software (object manager and communication interface) and a set of development tools (user interface, object description language and application generator).

More specifically, the project's objectives are:

- to design a flexible system architecture, based on standard operating systems, communication protocols and languages, capable of allowing the easy addition of new services, the deletion/modification of existing services, and so on.

- the implementation of a set of tools that will allow the executive user to develop self-service applications.

It is commonly believed that OOP shortens the lifecycle and lowers the costs of software development, by allowing for reusable software components (in the form of baseline classes) and by employing incremental problem solving (using subclasses). Furthermore, it is believed that OOP lowers maintenance costs,

since it permits the restriction of modifications only to those classes of element shown to be malfunctioning. SESEFA's aim is to go even further, by allowing executive users to build themselves a prototype of their intended application, by decomposing the system into classes, implementing methods (ie. functions specifying their behaviour), and putting these components together through explicit control flow relations. It is believed that, in order to provide the necessary flexibility and consistency, the tools which allow this work to be done have to operate in an object-oriented environment. The project's development environment will be UNIX, with C++ as the programming language. These choices have been dictated both by a need for standardization and by the growing acceptance of C++.

It is believed that for the partners, the industrial outcomes of this project will result in a specific product strategy in the business self-service domain, covering development, marketing, service and support, and international promotion. The project partners see a particularly promising market within the banking sector, currently already a significant consumer of self-service facilities. But with the rising availability and acceptance of telematic services through metropolitan area networks, significant market opportunities are expected in future in central public administration, local administration, and public services companies.

Partners plan to industrialize the project's results by:

- Building and marketing self-service stations tailored to specific needs and capable of being integrated into heterogeneous contexts according to international standards; specific deals will be struck among the partners for the integration of particular features over the common architecture and standard interfaces.

- Marketing the software design and development tools as an innovative product in the CASE area.

- Making use of their knowledge of the new technologies used to develop a new methodology for cooperating with client organizations in order to improve competitiveness and performance in consultancy activities.

In addition, partners believe there are common industrial interests that can be supported as a result of the work done in the SESEFA project:

- OOP-based approach. This will contribute to the acceptance of this new technology within the IT community.

- Design and development tools. This is particularly important for small software companies, allowing them to establish marketing contacts with larger enterprises.

Contact Point

Mr. F. Luchetti
PRISMA INFORMATICA SrL
Via Campo di Marte 4/n
I - 06100 PERUGIA

Tel: +39/75-5000245
Tlx: 572139
Fax: +39/75-71973
Fax: +39/55-2298778

Participants	**Country**	**Role**
PRISMA	*I*	*M*
ARCOS	*F*	*P*
ERIA	*E*	*P*
IKOSS	*D*	*P*
UNIVERSITA DI FIRENZE	*I*	*P*

Start Date: 02-MAY-89

Duration: 36 months

INTEGRATED SYSTEMS ARCHITECTURE (ISA)

PROJECT NUMBER: 2267

The aim of the project is to exploit Europe's lead in distributed systems technology by providing a common architectural framework and standards to enable the integration of distributed applications in the areas of office automation, manufacturing automation, corporate information systems and integrated services networks.

Several strands of activity are envisaged in order to achieve this overall aim, including:

- the determination of requirements for the architecture, utilising inputs from application domain leaders and IT suppliers

- the development of an architectural framework and the definition of generic functions and interfaces for distributed systems integration

- the use of this architecture as a basis for contributing to and accelerating standardisation of open distributed processing

- the validation of the architecture through technology demonstrations by the project partners

- the provision of a focus for expertise and of a technology transfer process for the wider industrial exploitation of open distributed processing standards

- and, in particular the maintenance of an architecture reference manual and a reference implementation, building upon work carried out in the previous project.

User demands and the pace of technological development inevitably generate networks linking systems from different suppliers, creating a market need for applications to be integrated across them. This is both an opportunity for the European IT industry - because of its lead in distributed systems - and a necessity - because of its fragmentation. By providing a common architecture the opportunity can be exploited and turned to advantage by specialisation.

Eight of the partners are already using the results of the previous project to meet some ISA objectives. The ISA project will extend, enhance and complete these results, for example by incorporating modelling aspects of business and information systems, and by the further development of tools and generic services in the reference implementation.

The architecture reference manual and reference implementation will be available to all ESPRIT projects and ISA will solicit input and feedback from a wide forum.

Through its partners, ISA will actively contribute to and reflect progress in the international standardisation of distributed processing.

In addition, ISA will be demonstrated on a wide variety of commercial systems including Unix, MS-DOS, VMS, Chorus, VME, Domain and OSF.

Product exploitation of ISA by the project partners is expected to follow on from the technology demonstrations, most of which will form part of product development programmes. The partners' plans include the exploitation of ISA in intelligent networking, switching systems, distributed and multimedia office systems and integrated services networks. Exploitation outside the consortium is expected to be stimulated both by the marketing of their products and as a consequence of international standards following on from ISA's contributions to the standards process.

The commercial benefits to partners are expected to include:

- faster product development, due to the generic components and a common framework

- greatly improved system design processes and tools

- improved applications portability

- higher performance distributed operating systems

- advancement of knowledge and expertise, leading to the early availability of products which conform to the standards derived the ability to rapidly integrate specialist systems and to form consortia for the supply of complex systems.

Contact Point

D.M. Eyre
STC/ISA
24 Hills Rd
UK - CAMBRIDGE, CB2 1JP

Tel: +44/223-323010
Fax: +44/223-359779

Participants	Country	Role
STC/STL	*UK*	*M*
AEG/MODCOMP	*D*	*P*
SEPT	*F*	*P*
SIEMENS	*D*	*P*
BRITISH TELECOM	*UK*	*A*
DEC	*B*	*A*
ICL	*UK*	*A*
ELLEMTEL	*S*	*A*
GEC-MARCONI	*UK*	*A*
GEC-PLESSEY TELECOMMS	*UK*	*A*
PATRAS CTI	*GR*	*A*
HEWLETT PACKARD	*UK*	*A*
PHILIPS	*NL*	*A*
INFORMATION TECHNOLOGY	*UK*	*A*
APM	*UK*	*A*
NEWCASTLE UNIVERSITY	*UK*	*A*
CHORUS SYSTEMES	*F*	*A*

Start Date: 01-MAR-89

Duration: 48 months

TOOLS FOR OBJECT-BASED INTEGRATED ADMINISTRATIVE SYSTEMS (TOBIASI)

PROJECT NUMBER: 2294

TOBIASI is a set of integrated and portable tools (ie. a workbench) aimed at helping and simplifying the administration of a large number of heterogeneous machines and networks. The use of an object-oriented approach allows a uniform description, in abstract terms, of facilities, equipment, operations, human-human interactions, and so on, without specifying organizational solution or connectivity details. In addition, as international standards are not very developed in this field, the promotion of their definition will be undertaken by TOBIASI.

The objectives of TOBIASI are twofold: the development of a common methodology based on an object-oriented model, and the definition and implementation of a workbench to support system and management activities.

TOBIASI is implemented on top of the UNIX and PCTE systems, but is not dependent on these environments and is open to integration with existing commercial products. It is envisaged that considerable efficiency improvements will be achieved by using TOBIASI system administrators to deal with complex distributed systems, and that TOBIASI will also enhance the overall dependability of system management processes. The system management domain represents a significant market, as yet completely unexplored. In TOBIASI, new and advanced technologies (eg. the objected-oriented approach, knowledge-based systems, graphics facilities, etc.) are used to increase the capacity of a system manager to manage and control the hardware and software components of hundreds of interconnected computers.

The project consortium is interested in the work because system complexity is growing and hence LAN and WAN connections are being used more intensively. There is a need to support this increased complexity, which TOBIASI will achieve.The results of the work will also lead to:

- better use of available computing resources
- reductions in system administration time and management costs, leading to increased competitiveness
- reductions in the skill and experience required of the system manager, due to the use of knowledge-based administration systems.

Industrial outcomes will take the form of:

- a well-defined line of products running on different operating systems
- the definition of standard guidelines for the development of a new generation of products
- the promotion of standards in this hitherto neglected area.

Contact Point

Mr. L. Stefanelli
INTECS International s.a.
R & D Department
Avenue Rogier 385 *Tel: +32/2-7355571*
B - 1030 BRUSSELS *Fax: +32/2-7348117*

Participants	**Country**	**Role**
INTECS INTERNATIONAL S.A.	*B*	*M*
GIE EMERAUDE	*F*	*P*
UNIVERSITY OF NEWCASTLE	*UK*	*P*
INTRASOFT	*GR*	*P*
PLANET	*GR*	*P*

Start Date: 20-MAR-89 *Duration: 36 months*

TRANSLATOR'S WORKBENCH (TWB)

PROJECT NUMBER: 2315

The Translator's Workbench (TWB) aims to develop and integrate a set of computer-based tools for ODA-compatible, multilingual text processing for the professional translator, which will ensure a grammatically and terminologically correct and consistent conversion of documents to and from a number of EC languages, for example English, German and Spanish. These tools include lexical, spelling and grammar checkers, text-processing utilities, remote-access utilities, and semi-automatic translation help facilities, all within an integrated framework.

The project has a good mix of large and small companies, IT users and producers, industry and universities. It is planned for three years, resulting in a first prototype by the end of 1990, and the final demonstrator by the end of 1991.

TWB will deliver up-to-date and competitive results in the UNIX environment, conform to international standards, and be capable of serving as a basis for future developments in the area of advanced text processing and computer-aided translation.

The partners have identified a number of common industrial interests, which can be summarized by the following three specific areas where they expect immediate effects on actual products:

- Multilingual Text Processing

  Simultaneous processing of different languages requires addressing such diverse issues as the simultaneous representation of different alphabets, and the provision of language checkers, such as spelling, grammar and style checkers, for the pre- and post-processing of texts written in different languages. Multilingual text processing, including semi-automatic translation help (for the fast pre-translation of texts), will be a key product for the professional office of the 1990s.

- Document Processing

  Technical writing in the documentation area is a growing market. In particular, in the field of product documentation, well designed and complete manuals need to be available for all languages within a very short time of the product itself becoming available. This involves the integration of large and frequently changing multimedia lexica for the fast extraction of terminological information for the non-technical expert.

- Remote Access to Machine Translation Systems

  Although machine translation systems of reasonable quality are already available on the market, they require special hardware and maintenance that are too expensive for the average professional user. Hence they need to be made more accessible. The possibility of accessing such systems through electronic mail networks will help to meet and to develop the potential of this market.

Contact Point

Dr. G. Heyer
TA TRIUMPH-ADLER AG
Hundingstr. 11 b
D-8500 NUREMBERG

Tel: +49/911-3226088
Tlx: 623295
Fax: +49/911-3226422

Participants	**Country**	**Role**
TA TRIUMPH-ADLER	*D*	*M*
SIEMENS	*D*	*P*
SIEMENS	*E*	*P*
MERCEDES BENZ	*D*	*P*
UNIVERSITY OF SURREY	*GB*	*A*
UNIVERSITAT POLITECHNICA DE CATALUNYA	*E*	*A*
UNIVERSITY OF HEIDELBERG	*D*	*A*
L-CUBE INFORMATION SYSTEMS	*GR*	*S*
UNIVERSITY OF STUTTGART	*D*	*S*
FRAUNHOFER GESELLSCHAFT	*D*	*A*

Start Date: 01-APR-89 *Duration: 36 months*

IT SUPPORT FOR EMERGENCY MANAGEMENT (ISEM)

PROJECT NUMBER: 2322

Project ISEM aims to develop an integrated information system capable of supporting the complex, dynamic, distributed decision-making associated with the management of emergencies. The focus will be on the definition of a system architecture, and the development of an application generator and tools to support the complete system life-cycle.

The components of such a system are by and large already available in the form of database systems, knowledge-based systems and communications technology. A suitable system architecture for integration of these diverse technologies is, however, not available; and neither are software tools for application generation and for the support of a system throughout its lifecycle. Special attention must be paid to tools supporting all aspects of management in relation to a system.

The support of emergency management was chosen as a specific application area in order to target the project properly. This area spans the management of accidents in hazardous technical industries as well as of emergencies in the service industry. To some extent the integrated information system can be thought as a C3I (Command, Control, Communication and Intelligent System) for a civilian organisation. It is needed to handle rare but potentially severe events.

The development will be driven by the requirement identified by emergency organisations in two very different industries, though care will be taken to ensure that the results will be easily transferrable and adaptable to other organisations.

Specific outcomes from the project will include two demonstrations of systems based on the defined architecture and conducted in experimental environments. Other results include well-documented software packages, end-user and system-manager training programmes, guidelines for further system improvements and plans for the introduction of the system into the market. The results will also provide a basis for validation trials in real-world environments.

The main objective of this project is to describe architectures and generate a set of accompanying software tools for an integrated information system to support complex, dynamic, distributed decision-making in large organisations, and to demonstrate the functionality of a full-scale system for emergency management. This kind of decision support system is not available today, but it is felt that information technology has reached a level of maturity where it is realistic and feasible to develop it. The development will, however, need extensive precompetitive R&D work and the successful completion of the project will mean an important advance for integrated information systems.

In addition, the project will lead to advances in the following areas:

- The exploration, development and description of architectures for decision support systems suited for emergency management of rare but severe events in large organisations. This implies application-oriented R&D work at the frontier of group decision support systems development, as well as system science considerations of organisational control structures. Only very general recommendations are available at present for a suitable architecture. Thus this aspect of the work on the project represents an interesting conceptual advance directly usable by system designers.

- The development of tools supporting system specification and design, knowledge acquisition, system development and maintenance throughout the complete system lifecycle. The collection of tools will be considered in the context of an application generator. The tools and the application generator are the tangible expressions of the architecture. It is expected that the system will show interesting applications and integrations of a number of advanced information-processing products. The project will provide a good basis for turning existing general tools into a variety of new products meeting the demand for more specific or higher-level functionality.

Other concrete project outcomes include:

- The design, implementation, testing and evaluation of two demonstration systems.

- The demonstration of the operation and maintenance of the decision support system. As the systems which constitute the areas of focus for the project are expected to have long lifecycles, system support and maintenance will be important. They will thus provide a rich testing ground for system management tools.

- The development of guidelines and strategies for the proper use of the project results (architectures and software tools embedded in the application generator) in a variety of industrial sectors. Judging from public debates as well as international conferences, this application domain is currently receiving a great deal of interest. This area of project work will facilitate the appropriate and timely exploitation of the results obtained.

Contact Point

Dr. Verner Andersen
RISO National Laboratory
P.O. Box 49
DK-400 ROSKILDE

Tel: +45/42-371212
Tlx: 43116
Fax: +45/42-360609

Participants	**Country**	**Role**
RISO NATIONAL LABORATORY	*DK*	*M*
SCAITECH A/S	*DK*	*P*
ADV/ORGA F.A. MEYER AG	*D*	*P*
TECNICAS REUNIDAS, S.A	*E*	*P*
VTT	*SF*	*P*
TECNATOM, S.A	*E*	*P*
JTAS	*DK*	*S*
UITESA	*E*	*S*
GRS	*D*	*S*
STUDSVIK NUCLEAR	*S*	*S*
ENEA	*I*	*S*
IGC	*E*	*S*
SCK-CEN	*B*	*S*

Start Date: 01-JAN-89

Duration: 36 months

PILOTING OF THE OFFICE DOCUMENT ARCHITECTURE (PODA-2)

PROJECT NUMBER: 2374

The overall objective of the project is to advance the application of the Office Document Architecture (ODA) standard to multimedia document handling in the context of multivendor systems, and to support the rapid development of ODA-based products that will benefit the whole Community. The result will be the practical exploitation, extension, refinement and promotion of ODA. Document handling is seen to cover creation, imaging, amendment, filing, distribution and access operations.

The project will complete the definition of a comprehensive ODA architecture sufficient to satisfy the needs of various office systems applications.

The work will be based on other ESPRIT projects including INCA (Integrated Network Architecture for Office Communication) and particularly on PODA (Piloting the Office Document Architecture) from which PODA-2 will ensure a smooth continuation.

The project consists of two work-packages, each in turn composed of a number of tasks. These work-packages are :

- ODA Interworking

  Through public demonstrations to show that ODA provides effective interworking between currently available products.

- ODA Advancement

  To develop a comprehensive system architecture, interfaces, protocols and kernel functions for advanced office systems applications based on ODA.

The final phase of the Interworking work package will concentrate on demonstrating the results of the Advancement work package.

There are three key elements in the approach to the project:

- Multivendor interworking will be the methodology used to realise the technical developments within the project.

- All the project tasks are aimed at increasing the effective application of the ODA standard, in particular, and of multimedia document handling standards, in general.

- The project will act as a centre of expertise for technical liaison with related activities. Wide and efficient dissemination of information will be regarded as vital.

Contact Point

Mr. J.A. Nelson
ICL
Lovelace Road
UK - BRACKNELL RG12 4SN

Tel: +44/344-424842 x2439
Tlx: 22971
Fax: +44/344-487832

Participants	**Country**	**Role**
ICL	*UK*	*M*
OLIVETTI	*I*	*P*
NIXDORF	*D*	*P*
IBM DEUTSCHLAND	*D*	*P*
BRITISH TELECOMMUNICATIONS PLC	*UK*	*P*
OCE-NEDERLAND	*NL*	*P*
TITN	*F*	*P*
BULL	*F*	*P*
SIEMENS	*D*	*P*
UCL	*UK*	*A*

Start Date: 01-JAN-89

Duration: 30 months

ELUSIVE OFFICE (ELO)

PROJECT NUMBER: 2382

The economies of developed countries are already showing an established trend of being based upon office work, and this trend is likely to become even more important in the future. Office work is in turn becoming increasingly dependent upon information technology and information systems support. Advances in information technology mean that the style of office work is changing rapidly, and that support for office workers who routinely work away from company offices is becoming necessary. This project addresses the problems of this class of worker. European companies need to be aware of the trends in office work, and to be able to take advantage of developments such as the Elusive Office (ELO).

Office work is changing in a number of ways. It is becoming dispersed, both in time and in geographic location, and is also frequently mobile, so that truly portable equipment and good communications are essential. In addition, the impact of international markets with differing time zone problems is significant. There is thus a need for an integrated information system, where integration is seen to take a number of forms:

- integration among applications available to the office worker without the need to re-key information
- integration between the personal workstation and the company's central data sources
- integration among separate mobile workers (for the exchange of information)
- integrated access to data sources external to the company.

This wide range of integration requirements is to be addressed by the ELO project.

The proposed ELO system has a number of components which are highly adaptable to specific ELO environments:

- hardware with sophisticated communications capabilities
- generic software tools for easy generation of integrated applications, with special consideration given to security requirements
- software for applications specific to a particular ELO
- computer-based learning and supportware for ease of use and ease of management.

In the course of the project, the ELO system will be implemented in demonstrator form in real working environments. Adherence to the principles of modularity and integration in the design of both hardware and software will be a central aspect of the project. This will enable ELO systems to be implemented easily and effectively

in many of today's office environments and in a wide spectrum of future Elusive Offices. Wide applicability will be further aided by the specific recommendations which will emerge for standards development in areas as diverse as cellular radio terminal equipment and computer-based learning tools.

The results of the ELO project will be an ELO hardware and communications technology demonstrator and a highly integrated set of software and tools, enabling close communication among applications on the mobile workstation, between workstation and the central computing services, and also among mobile workers. The framework method of integration provides a flexible, extensible and adaptable system sensitive to changing user requirements. These features will be of major benefit to European IT suppliers and user companies.

Contact Point

Mr. W.B. Korte
Empirica
Kaiserstr. 29 - 31
D-5300 Bonn 1

Tel: +49/228-210070
Tlx: 5212689
Fax: +49/228-210279

Participants	**Country**	**Role**
EMPIRICA	*D*	*M*
SEL AG	*D*	*P*
RUTHERFORD APPLETON LAB.	*UK*	*P*
CLS	*D*	*P*
ÖVA VERSICHERUNGEN	*D*	*A*
REALACE LTD.	*IRL*	*A*
FRAUNHOFER GESELLSCHAFT	*D*	*P*
HEPTACON LTD	*UK*	*S*
NEPTUNE FREIGHT LTD	*IRL*	*S*
OTTERBECK	*D*	*S*
BONNSCRIPT	*D*	*S*

Start Date: 09-JAN-89

Duration: 48 months

PRIMARY RATE ISDN OSI OFFICE FACILITIES (PROOF)

PROJECT NUMBER: 2404

The aim of the PROOF project is to evolve Primary Rate ISDN (PRISDN) support for Open Systems information services in the office environment. This support will be analogous to that which is currently supplied by local area networks (LANs) and packet-switched wide area networks in the context of the Open Systems Interconnection Environment (OSIE).

To accomplish its objective the project will, within the context of such OSI standards (CCITT, ISO, etc.) as are appropriate:

- enhance the primary rate capabilities of a currently available PABX to achieve ISDN circuit bandwidths of greater than 64 Kb/s;

- develop a gateway which will use these PABX capabilities to interconnect OSI office LANs, terminals and servers via PRISDN

- add a primary rate interface to a UNIX server.

The gateway will connect the ISDN PABX to an Ethernet (IEEE 802.3) LAN, with potential for future connection to other local and packet-switched wide-area networks. Together, gateways and PABX will aim to make the most efficient use of available bandwidth.

Two important applications, messaging and document handling services, will be superimposed on the new infrastructure to demonstrate its effectiveness in the office environment. These applications in turn will require the use of evolving OSI services, including authentication and security services, distributed directories, and network management. They will make demanding use of the underlying networks and are expected to uncover many problems in the use of the concatenated network services.

The project will culminate in a demonstration of these office applications and supporting services running on Ethernet LANs connected to one another via gateways and the PRISDN PABX. This OSI environment will be extended to an external server and workstations connected to one of the gateways via the ISDN PABX.

The results of the project will serve both the industrial and academic communities, and will be immediately exploitable by the partners. The knowledge gained is to be applied in developing commercial products for the international market as appropriate to the business interests of each of the individual partners. These products will be an ISDN PABX, a PRISDN gateway and OSI directory, and security software. The results will also be disseminated throughout the European community by participation in standards committees and conferences, and by publishing papers.

Contact Point

Mr. B. Patel
3 Net Ltd
Ringway House
Bell Road
Daneshill
UK - BASINGSTOKE RG24 0QG, HANTS

Tel: +44/256-843311 x230
Tlx: 8950511
Fax: +44/256-840429

Participants	**Country**	**Role**
3 NET LTD	*UK*	*M*
NIXDORF COMPUTER AG	*D*	*P*
SYSTEM WIZARDS SRL	*I*	*P*
UNIVERSITY COLLEGE LONDON	*UK*	*P*

Start Date: 01-JAN-89

Duration: 48 months

HOME SYSTEMS (HOME)

PROJECT NUMBER: 2431

Home systems applications are emerging as an important market sector. Communications and control standards for a systems approach have to be extended and further developed. These standards will allow for the use of multi-brand and multi-application products in family residences, and take account of extensions to cover small business and service premises.

European industries and organisations realise that the efforts involved go beyond individual capabilities. This project enable the sharing of R&D resources to provide further advances in this area and will take joint responsibility for the standards to be proposed.

The intended target markets include the consumer electronics, white goods, brown goods, lighting, telecommunications and installation sectors. The convergence of these different sectors will create new opportunities and added value to current products. An evolutionary approach, supported by architectural integrity, will therefore be followed.

The objectives of the Home Systems project are:

- to propose standards suitable for bringing products onto the market which can be used in multi-brand and multi-applications home systems, with extensions to cover small business and service premises

- to analyse the wiring infrastructure, with special emphasis on bus-integrated installation, requirements, and installation support

- to validate and demonstrate the proposals made

- to provide draft home and building specifications to relevant parties.

The current state of the art is characterised by the fact that though in the market only single-brand applications are visible, preparations are being made internationally for a multi-applications systems approach. Preliminary proposals for standards to support such a development have been prepared in Japan and the US, and also in Europe within the Eureka 84 IHS project. However, it is obvious that further advances are necessary and the present ESPRIT Home Systems project aims to achieve them.

The main outcomes of the project will be:

- user requirement specifications and scenarios for the "Home and Building of the Future"

- proposed Home Systems standards

- validation results

- a draft installation guide and best-practice recommendation

- relevant multi-brand and multi-application demonstrations.

The outcomes of the project will provide a platform for the individual participants to augment their share in an evolving systems-driven market. This includes the extension of existing products, combinations of such products on a multivendor basis, and the development of completely new applications made possible by the evolving standards.

In particular, the link between typical Home Systems appliances and public telecommunication services will be further developed. The use of the power distribution systems as a service carrier will be clarified.

All partners aim at the industrialisation of new possibilities in the entertainment, education, convenience, comfort and security markets through an integrated approach.

Contact Point

Dr. L.E. Zegers
Philips International B.V.
NL - SWA 809 Eindhoven

Tel: +31/40-734311
Tlx: 35000
Fax: +31/40-732037

Participants	Country	Role
PHILIPS INTERNATIONAL B.V.	*NL*	*M*
ABB	*D*	*P*
AEG	*D*	*P*
BRITISH TELECOM	*UK*	*P*
GEC	*UK*	*P*
LEGRAND SA	*F*	*P*
PHILIPS COMPONENTS	*UK*	*P*
SIEMENS	*D*	*P*
THOMSON GRAND PUBLIC	*F*	*P*
THORN EMI	*UK*	*P*
ZELTRON	*I*	*P*
ALCATEL STANDARD ELECTRICA S.A.	*E*	*A*
BANG & OLUFSEN	*DK*	*A*
HONEYWELL EUROPE S.A.	*B*	*A*
INFRATEST INDUSTRIA	*D*	*A*
JYSK TELEFON (JTAS)	*DK*	*A*
UNIVERSITY OF BRISTOL	*UK*	*A*
BASSINI TICINO SPA	*I*	*A*
DOMINO-STUDI E RICHERCHE PER L'EDILIZIA E L'ABITARE S.R.L.	*I*	*A*
IKERLAN	*E*	*A*
PIRELLI INDUSTRIE S.P.A.	*I*	*A*
SELECO S.P.A.	*I*	*A*
AEG KABELWERKE	*D*	*S*
BUSCH-JAEGER-ELECTRO GMBH	*D*	*S*
ELECTROLUX MECATRONIK	*S*	*S*
CENTRE REGIONAL INNOV./TRANSFER DE TECHNOLOGIES ELECTR./OPTIQUE	*F*	*S*

Start Date: 16-JAN-89

Duration: 24 months

LARGE-IMAGE TERMINALS (LIT)

PROJECT NUMBER: 2455

The partners in this project perceive the need for programmable, large-screen video displays, suitable for use in a wide variety of applications including advertising, teleconferencing, notice boards, point-of-sale terminals and map displays. The performance requirements for such devices may be summarised as:

- a large-screen image in a compact system cabinet

- facilities to allow the user to interact easily with the system via, for example, touch screens.

The main aim of this project is to produce a demonstrator which fits these requirements.

Back-projection of liquid crystal displays is the technology chosen for the display. Development work on this aspect of the system will centre on producing high-resolution LCDs and an ultra-compact, distortion-free projection system, which is expected to be lighter and less bulky than conventional projection CRT systems. The technology required to implement the interactive screen itself will be defined after human factors studies in the early phases of the programme.

The intention is to design the system architecture such that it will be possible to integrate a remote link at a later stage. Two working units will be produced: one to serve as a prototype feasibility demonstrator, designed to be as close as possible to a final product aimed at the advertising market; and the other to be used for assessment purposes.

An important feature of the project is the use of human-computer interaction methodologies throughout, to optimise the user friendliness and versatility of the system, and to minimise future iterations in the product design.

The range of potential applications for these types of terminals can be expected to be widened with the use of remote communication links (not planned in this phase) such as radio, ISDN, mains-borne, infrared and telephone. A significant market is expected to develop in the next 10 years for these remotely programmable terminals. For advertising alone, the European market for large-image terminals would appear to be very significant, when one considers that the UK advertising market was worth at least 5 billion pounds sterling in 1986, of which the advertising hoarding business was in excess of 200 million pounds sterling.

Contact Point

Dr. M.A. Carter
THORN EMI Central Research Laboratories
Dawley Road
UK - HAYES UB3 1HH, MIDDLESEX

Tel: +44/1-8486436
Tlx: 934135
Fax: +44/1-8486565

Participants	**Country**	**Role**
THORN EMI	*UK*	*M*
SEL	*D*	*P*
NOKIA GRAETZ	*D*	*P*
HERIOT-WATT UNIVERSITY	*UK*	*P*

Start Date: 23-JAN-89

Duration: 36 months

APPLICATION-RELATED GRAPHICS IN OSI STANDARDS (ARGOSI)

PROJECT NUMBER: 2463

The project arose out of the observation that graphics, OSI and other standards are generally being developed in isolation, and that insufficient attention is being paid to the special needs of applications whose requirements span several standards. As distributed computing becomes the norm, the requirements for interworking between graphics and networking standards becomes more acute.

ARGOSI acknowledges the work that already exists in standardisation bodies. The project will provide a forum in which European input to the development of graphics standards can be coordinated, requirements for future standards can be ascertained, and information on usage can be colated. Participants in the project will engage in national body and ISO standardisation activities specifically related to the harmonisation of graphics and networking standards.

This will enhance the European contribution and influence in these areas, and will strengthen the position of the industrial partners in the consortium in terms of their ability to offer commercial products, both at the infrastructure and at the applications levels, which are soundly based on international standards. The project expects to organise a number of workshops on graphics and networking to solicit a broad spectrum of inputs.

The project is application driven, in that a wide range of applications will be classified in terms of their needs in terms of graphics and networking and other required services. The extent to which these can be satisfied by existing or emerging standards will be assessed. Recommendations to standards bodies will then ensue.

The project also has a strong practical flavour and will construct one major demonstration of graphics and networking services for a carefully chosen realistic prototype application. The demonstrator will be implemented on UNIX-based workstations to allow for easy dissemination of the results amongst the partners and other computer users. It is expected that the implementations of graphics and networking standards (enhanced where necessary to establish interworking) developed in the project will emerge as commercial products. The results will also be fed into the standardisation process.

Project duration is 3 years, and twelve partners are involved, from a number of Community countries. The partners are all familiar with the relevant standards and have all made major contributions to standardisation activities. The consortium is well-balanced between industry, academia, and small and large organisations.

The geographical distribution of the partners is an important consideration in the project. A public OSI network exists in four of the five countries represented and the fifth should soon have such a facility in place.

ARGOSI will use these public facilities for the demonstrator across the different countries and this will be a useful experience and experiment in communication between the member states represented.

Contact Point

Mr. M. Vernay
THOMSON - CSF
160 Bld. de Valmy
B.P. 82
F - 92704 COLOMBES CEDEX

Tel: +33/147-603000
Tlx: 204780
Fax: +33/147-603357

Participants	**Country**	**Role**
THOMSON-CSF-CIMSA-SINTRA	*F*	*M*
INRIA ROCQUENCOURT	*F*	*P*
HITEC	*GR*	*P*
GMD	*D*	*P*
TECSIEL S.P.A.	*I*	*P*
COSI-CONSORZIO PER L'OSI IN ITALIA	*I*	*P*
RUTHERFORD APPLETON LABORATORIES	*UK*	*P*
GESI S.R.L.	*I*	*A*
LASERSCAN LABORATORIES LTD	*UK*	*A*
UNIVERSITY OF EAST ANGLIA	*UK*	*A*
FRAUNHOFER GESELLSCHAFT	*D*	*A*
GTS-GRAL	*D*	*A*
SELENIA S.P.A.	*I*	*S*

Start Date: 01-MAR-89 *Duration: 36 months*

KNOWLEDGE WORKERS INTELLIGENTLY COLLECTING/COORDINATING/CONSULTING KNOWLEDGE (KWICK)

PROJECT NUMBER: 2466

KWICK will provide scientific and technical knowledge workers with an environment aimed at improving the productivity and quality of their work. Based on a distributed client-server architecture, integrating AI and hypermedia technologies, KWICK will provide easy access to information and knowledge resources, computational resources and support services.

KWICK will be based on and will comply with international standards like UNIX, OSI, ODA and the OSF Core UEC user interface. In the KWICK architecture, the user will be assisted by "intelligent agents". A set of server packages will be accessible in the user nodes on workstations connected to a range of networks linked to hosts. The main server packages of KWICK are the Hypermedia Document Server, Statistical and Numerical Computation Packages, the Inference Engine and the Theorem Prover. These will mainly run at the host level. User nodes will coordinate the user's activities through a suitable KWICK user interface. The KWICK or user-developed "intelligent agents" will supervise users, user nodes, and servers. The user will be able to define and develop new agents with the aid of existing agents and servers and using powerful object-oriented tools. Agents such as librarians, information experts, mathematical supervisors, cataloguing advisors and document quality monitors will enhance the speed of development and improve the quality of user-developed agents.

Although today high-quality stand-alone tools for knowledge workers do exist, the development of a unified environment integrating hypermedia and AI technologies is still in its infancy. The need to improve researchers' and knowledge workers' productivity is the context for KWICK. The recent move of the NeXT company in providing a very advanced set of tools for higher education on a single workstation indicates the direction in which the competition is going. Universities, industry, R&D laboratories, documentation centres and publishers will be the main markets. With the decrease in workstation costs, a large educational market will also become of interest for KWICK products. Moreover, KWICK will have a spin-off into more general-purpose office automation systems.

The technical focus of the project will be the technology of intelligent agents (design and development of new agents, composition of agents) able to operate on hypermedia and multimedia objects and to support users and user nodes in an integrated distributed environment, providing the services of remote as well as local servers.

The final results will include the above-mentioned servers and intelligent agents, with the user interface offering the integrated environment. Intermediate subsystems will spin off during this three-year project through a realistic prototyping approach.

Providing an open tool to a wide market (as described above), KWICK has a strong exploitation potential. The partners will consider the project spin-offs for industrialisation as soon as they are available. This will certainly be the best way to

monitor the situation with respect to competition and market reaction. At the end of the project the partners will have various possibilities open to them for exploiting the integrated results of the project.

Contact Point

Mr. A. Cicu
BULL ITALIA
Via Laboratori Olivetti
I-20010 PREGNANA MILANESE (MI)

Tel: +39/2-93368264
Tlx: 332522
Fax: +39/2-93368456

Participants	Country	Name
BULL S.A.	*I*	*M*
UNIVERSITY OF GLASGOW	*UK*	*A*
TECOGRAF SOFTWARE	*I*	*P*
CNRS	*F*	*A*
ADV/ORGA	*D*	*P*
AIS	*B*	*A*
IIRIAM	*F*	*P*
ELSEVIER	*NL*	*A*
UNIVERSITA DI MILANO	*I*	*A*
CEC-JRC ISPRA	*I*	*A*
ESPASA CALPE	*E*	*A*
NTUA	*GR*	*A*
ELSA SOFTWARE	*F*	*S*
MVID	*NL*	*S*
OFFICE WORKSTATIONS	*UK*	*S*

Start Date: 01-MAR-89 *Duration: 36 months*

BANK 92 (BANK 92)

PROJECT NUMBER: 2476

This project addresses the distributed and departmental requirements of the European banking environment after harmonisation in 1992. BANK 92 is a strategic project, lasting 3 years, in the field of systems for information-based organizations (area III.2.4.1 of the 1988 Workplan).

The goal is to allow any application package developed according to the BANK 92 standards to be easily ported to any system that has implemented the BANK 92 environment. The advantages of this approach are twofold:

- application packages developed independently by different software vendors can coexist and operate in the same BANK 92 environment

- additions or replacements to an existing hardware system, to improve performance or efficiency, can be offered by hardware vendors without affecting existing application packages.

The state of the art of advanced technology and the potential contribution of other related ESPRIT I and ESPRIT II projects will be evaluated. Areas addressed by this project activity include UNIX-based servers with workstations, a standard communication architecture (OSI), local and wide-area network services, database facilities (SQL), fault tolerance and high-level security, as well as window-based presentation and knowledge-based systems (KBS).

The name for the project, BANK 92, clearly identifies that one of the main targets is to develop banking applications directly addressing the issues related to the Single European Act.

The banking community is amongst the first to be affected by regulatory changes. By maintaining close links with the European banking community at all stages of the work, BANK 92 will enable the consortium members to meet new requirements as they evolve. Furthermore, a very ambitious objective for the BANK 92 project will be to try to define a set of European standards for banking applications.

Deliverables for this project will be a financial information systems architecture with special emphasis on:

- standardised (nucleus and user) interfaces
- concurrent parallel development, which will be demonstrated and integrated
- distributed and fault-tolerant system features
- distributed development and run-time tools
- application-level interworking of workstations and servers
- a sample application, as specified by the associated banking partners.

All the partners are interested in banking and share a common view of the importance of providing a basis for the development and integration of banking and distributed applications. The consortium is composed of different kinds of participants with varied approaches to the exploitation of the project results:

- Partners with manufacturing interests will actively promote the new standards and the new methodology in the marketplace, thereby creating an environment from which bankers and software houses will derive major benefits.
- Software houses will exploit both the know-how acquired by their specialists in terms of banking application architecture, software development standards, etc., and the products resulting from the research. Once the prototype banking applications are installed and running, further development of hardware-independent software packages for the banking community may start immediately.
- Alerted to the new developments, the banks which are associate partners will enhance their own competitiveness in the harmonised market after 1992.

Contact Point

Mr. G. Puig
BULL SPAIN S.A.
Arturo Soria 107
E - 28043 MADRID

Tel: +34/1-4169218
Tlx: 27435
Fax: +34/1-4169957

Participants	Country	Role
BULL	*E*	*M*
IPACRI	*I*	*P*
PRISMA	*I*	*P*
IKOSS	*D*	*P*
ARCOS CONSEIL	*F*	*P*
COMPUTER LOGIC	*GR*	*P*
CAP GEMINI SOGETI	*F*	*P*
ENTEL S.A.	*E*	*P*
ICL	*UK*	*P*
COMPUTER TECHNOLOGY INSTITUTE	*GR*	*P*
BANCO DE SABADEL	*E*	*A*
CAJA DE AHORROS DEL MEDITERRANEO	*E*	*A*
UNIBANQUE	*F*	*A*
CAJA INSULAR DE AHORROS DE CANARIAS	*E*	*A*
CREDITO ITALIANO	*I*	*A*
BANCO HERRERO	*E*	*A*
THOMSON - CSF	*F*	*A*
INESC	*P*	*A*
MT BANK	*GR*	*S*

Start Date: 28-FEB-89 *Duration: 36 months*

THE SPIRIT-I WORKSTATION (SPIRIT)

PROJECT NUMBER: 2484

The SPIRIT workstation project aims to design and build a high-performance, technical workstation to support computationally demanding activities in computer-aided engineering, image processing, graphical interaction, knowledge-based systems, modelling and simulation, and the development of advanced applications software. The industrial partners intend to market a commercial product based on the prototypes developed within the project, and expect to establish a position of dominance in the high-performance end of the European technical workstation market by the mid-1990s.

The workstation will use a small-scale multi-processor design, based around a central very high-speed memory system and using data rates capable of transmitting real-time video or providing real-time 3-D graphical interaction. General-purpose processors (chosen early in the project from the leading industry-standard processors) will be used, as well as a high-performance AI processor. The software base will include an industry-standard UNIX system, augmented with object-oriented programming environments and AI languages, particularly PROLOG, all capable of integration with networking facilities. The system software will be implemented with state-of-the-art software technology which includes an operating system kernel suitable for multiprocessor and distributed working.

To achieve the wide range of capabilities envisaged, without causing unnecessary costs for applications with different technical requirements, the hardware architecture chosen is modular, with high performance in three particular areas: 2-D and 3-D graphics, AI languages, and image processing, each achieved with special-purpose hardware subsystems that could be omitted from any particular machine. On the other hand, sharing development and software costs means that the workstation as a whole will be cheaper to develop than many specialised machines directed at narrower market segments.

The project is founded on the cooperation of industrial partners across national boundaries, bringing together four groups in four different countries, each contributing excellence in different areas of workstation design, image processing, system software, graphics hardware, and AI language hardware.

A fundamental outcome of the SPIRIT workstation project will be to enable European industry to achieve at least parity with non-European competition at the high-performance end of the workstation market. This will not only provide a good position for progressing to more advanced products in the later 1990s, but will also provide a base to support the migration of high-end technology to lower-cost machines throughout the 1990s.

Specific areas of industrialisation include:

- A general-purpose technical workstation, with workstation products derived from the SPIRIT I prototype marketed through the existing channels available to the industrial partners.

- Specialised technical workstations, where, for a number of specific applications requiring high-performance dedicated subsystems, complete solutions will be generated by the industrial and academic partners, possibly involving additional companies external to the SPIRIT I project.

- Specialised subsystems, multiprocessor operating system and graphics software, with hardware and software components marketed individually as OEM products.

Contact Point

Mr. D. Strehmel
Kontron Electronik
Breslauer Str. 2
D - 8057 Eching

Tel: +49/8931-901489
Tlx: 522122
Fax: +49/8931-901311

Participants	**Country**	**Role**
KONTRON ELECTRONIK	*D*	*M*
CAPTION	*F*	*P*
QUEEN MARY COLLEGE	*UK*	*P*
ASSOCIATED COMPUTER EXPERT	*NL*	*P*
BRITISH AEROSPACE	*UK*	*P*
UNIVERSITÄT TUBINGEN	*D*	*P*
UNIVERSITY OF SUSSEX	*UK*	*P*
LOGIC PROGRAMMING	*UK*	*S*
LPA	*UK*	*S*
EPSILON	*D*	*S*

Start Date: 05-DEC-88 *Duration: 48 months*

CD-ROM WORKBENCH (CDR)

PROJECT NUMBER: 2499

Optical devices for data storage are an extremely promising area in information technology, allowing editors and publishers to compile and distribute very large databases (information banks) in a very cost-effective way. Editors are defined here as those who know how to present information to end-users. Providing information implies using multimedia information such as text, graphics, and audio, coupled with easy-to-use, advanced interactive retrieval systems.

The growing need for new types of applications software that allow the seamless integration of information into standard applications can be met only with great difficulty by the software industry. The lack of suitable development environments and efficient tools for read-only media is seen as one of the main obstacles.

Though the technology is available, editors and the software developers are in urgent need of an integrated workbench (a development environment of tools and methodologies based on commonly used standards) which allows the use of optical media in a cost- and functionality-competitive fashion.

This project aims to develop an advanced, flexible workbench for fast and cheap development of a range of CD-ROM applications, meeting the needs of information banks and databases and intended for use as an integral part of the professional workstations of the 1990s.

The workbench will be designed with an open architecture and clearly separated layers and modules, to allow for future extension. It will be based on a number of international and industry standards, to ensure the broadest range of applications, and will provide an integrated set of tools for the most important activities in the CD-ROM production process.

The project will encompass development of one or two real-life applications, from the point of view of the workstation of the 1990s, to test the viability of the project and to demonstrate how CD-ROM can be used in the future. The partners expect the following industrial benefits from the project:

- All partners are active in the field of optical media and/or large databases. The project will provide with state-of-the-art knowledge of important aspects of the technology, and therefore improve the competitiveness of their products.

- Software modules developed by a partner will be included in that partner's products.

- Specific deals between partners will allow them to include in their products other software modules resulting from the project work.

- The partners will be able to license the software developed under the project, with the associated hardware, if appropriate, to publishers and content providers to allow them to carry out their projects in-house.

- The partners will be able to license the software to other software houses and service bureaus.

Contact person

Mr. M. den Brok
ELEKTROSON BV
Stationstraat 1a
NL - 5281 GA BOXTEL

Tel: +31/4116-76444
Fax: +31/4116-77411

Participants	**Country**	**Role**
ELEKTROSON BV	*NL*	*M*
CLARINET LTD	*UK*	*P*
TEXTWARE A/S	*DK*	*P*
ACT SYSTEMES	*F*	*P*
NIJMEGEN UNIVERSITY	*NL*	*P*

Start Date: 15-FEB-89

Duration: 36 months

INTELLIGENT AREA COMMUNICATION AND INFORMATION SYSTEM (IACIS)

PROJECT NUMBER: 2512

The project aims to provide a system suited to meet the communication and information needs of "intelligent areas" supporting large information-based organisations (eg. business or commercial centres, ports, airports, etc.). These areas show urgent needs for a total solution specifically oriented to cost savings in system installation and maintenance, and capable of ensuring straightforward interworking of heterogeneous user subsystems.

The key objectives are the definition, design, development and testing, both in the laboratory and in the real environment, of a system capable of solving the problems of these emerging markets for information technology applications. Innovative solutions proposed in the LION (Local Integrated Optical Network) project, under development during the first ESPRIT phase, will be advantageously considered and an upgraded version of the nodes will be developed. The goal of settling demonstrators representative of real user requirements dictates a need to select very complex environments, such as seaport areas (ie. Genova, Barcelona, Le Havre and Lisboa) and large events (ie. the Olympic Games), as these complex domains will facilitate the assessment of the system as a whole.

Integrated service LANs (ISLNs) represent the newest generation of local area networks for attaining service integration in the enterprise of the future. In this field the state-of-the-art is represented by laboratory prototypes of fibre-optic distributed networks working at speeds around 100 Mbit/s (eg. LION, Metrocore). These systems are capable of supporting a wide range of information services (message handling systems, file transfer, electronic data interchange, network management, data base tools, etc.), at present in a standardisation or experimentation phase, and are required by applications aimed at large organisations.

The awareness of the potential market for multiservice networks has led quite recently to study and standardisation activities worldwide: noticeable examples of this trend are the Fibre Distributed Data Interface (FDDI-II) and the Distributed Queue Dual Bus (DQDB) proposals. By 1995, the intended applications sectors (business and commercial centres, campuses, hospitals, teleports and service-intensive areas) will foster for ISLNs of this kind a market of several thousand nodes in Western Europe alone.

The technical novelty of the project comes from its definition and implementation, through the adoption of the newest international standards, of an integrated intelligent environment, based on the most advanced technologies, such as fibre optics, VLSI circuits and artificial intelligence techniques.

The project extends over four years, and will deliver the following main results:

- an optical-fibre-based, 140 Mbit/s communication susbsystem, with a fault-tolerant topology and a multiple access protocol exploiting hybrid switching techniques to provide both circuit and packet communication

- gateways to public and private networks, such as ISDN, Ethernet, Token Bus and Token Ring

- user-equipment interfaces for voice, video and data traffic

- network information services, such as message handling systems, directory, file transfer, network management and document exchange tools

- application information services, including distributed database, natural language interface, security system, videotex and application generator tools

- applications for seaport area automation.

A significant and balanced participation of manufacturers, users, operators, consultants and system integrators will guarantee appropriate and wide-ranging exploitation of results. Project planning by the consortium has identified a number of areas of activity, at both the development and marketing levels, including:

- development on an industrial basis of the network infrastructure and of network and application information services

- commitment to the usage of the entire system by the seaport companies involved

- efforts towards international standardisation bodies in the fields of communication subsystems, and information and support services.

Contact Point

Mr. Fausto Fernandez Sanchez
TELEFONICA
Cooperación Internacional *Tel: +34/1-2332110*
c/ Beatriz de Bobadilla 3, Planta 9 *Tlx: 46032*
E - 28040 MADRID *Fax: +34/1-2337975*

Participants	Country	Role
TELEFONICA	*E*	*M*
INESC	*P*	*P*
BULL	*F*	*P*
TECNO T & G	*E*	*P*
SYD SYNERGIE	*F*	*P*
CSELT	*I*	*P*
SYNERGIA	*I*	*P*
SERVICIO DE GESTION TECNOLOGICA	*E*	*A*
ENTEL	*E*	*A*
HONEYWELL BULL ITALY	*I*	*A*
LGMI	*F*	*A*
OSITEL	*F*	*A*
PRISMA	*I*	*A*
SECRE	*F*	*A*
SIRTI	*I*	*A*
SISTEMI E TELEMATICA	*I*	*A*
UNIVERSIDAD POLITECNICA DE MADRID	*E*	*A*
TELEVAS	*I*	*A*
UNIVERSITY OF STUTTGART	*D*	*S*
STOLLMANN	*D*	*S*
SISMET	*P*	*S*
AUTONOMOUS PORT OF BARCELONA	*E*	*S*
APL	*P*	*S*

Start Date: 10-APR-89 *Duration: 36 months*

GENERAL DISTRIBUTED ARCHITECTURE FOR UNIFIED COMMUNICATIONS IN HETEROGENEOUS OSI ENVIRONMENTS (GAUCHO)

PROJECT NUMBER: 2563

The GAUCHO project aims to provide an integrated environment for the use of OSI communication services by existing DP applications.

The OSI services considered in the GAUCHO project are the communications services File Transfer, Access and Management (FTAM) and Message Handling (X.400), the OSI directory service and the OSI management facilities. It is a main goal of GAUCHO to bring these services to the dominant industrial and commercial DP environments at the same time as new standards are established.

In general, products supporting OSI services have not yet been integrated into the basic system services of commercial DP systems. The basic OSI standards for the upper layers of the OSI model have only recently reached a stable stage, and products implementing early versions of OSI standards like FTAM or X.400 provide stand-alone functions that are not usually integrated into local operating system services.

The outcomes envisaged for GAUCHO will be achieved in two phases. Phase 1 (the first 18 months) will analyse the requirements of user and network service providers and provide detailed insights into the OSI, VAN (Value Added Network) and EDI market requirements within Europe. It will also develop an architecture concept for integrated OSI service environments and a common engineering methodology for service implementation. The effectiveness of this concept will be demonstrated by an OSI sample application (OSI-FTAM), chosen as a result of current market demands, and provided with the necessary underlying OSI communication services by the end of month 18. To validate the usefulness and effectiveness of the integrated OSI service environment provided by GAUCHO, an EDI application will be prototyped. Thus Phase 1 will give a well-rounded survey of OSI and EDI market requirements, and provide a fundamental common architecture and basic application and communication services.

Phase 2 (months 19 to 48) will use the results of Phase 1 to prototype the target-independent architecture in a European OSI network consisting of different public and private networks and a number of representative target DP environments. It aims to validate the approach adopted and to facilitate subsequent industrialisation by the industrial partners. The project will choose as target systems both centralised mainframe systems and distributed LAN systems with workstations.

The intended exploitation by the various GAUCHO partners has four aspects:

- Products

  Because of the system-independent nature of the development results of GAUCHO, all partners will have a good basis for the development of further OSI and EDI communication tools for distributed DP systems. OSI/EDI communication tools (hardware and software) will be one of the most important DP services in the near future.

- Tools

  During the course of the project several tools for the software development and management of international projects will be defined, implemented and developed. All these tools can be part of a toolset for later development projects.

- Experience

  All partners in the GAUCHO project will gain experience in the development of OSI communication tools and the management of international projects. This experience will be used directly in development projects and consultancy activities with their customers.

- Market

  The GAUCHO project aims to implement a system independent integrated OSI and EDI environment. Such an environment will have at least the whole European business community as potential customers.

Contact Point

Mr. Jan Bruun
Project Management Consultants
17 Square Ambiorix *Tel: +32/2-7338357*
B - 1040 BRUSSELS *Fax: +32/2-7338869*

Participants	**Country**	**Role**
ADV/ORGA F.A. MEYER AG	*D*	*M*
RC COMPUTER A/S	*DK*	*P*
DANNET A/S	*DK*	*P*
FISCHER & LORENZ LTD	*GB*	*P*
PROJECT MANAGEMENT CONSULTANTS A/S	*DK*	*P*
UNIVERSIDAD POLITECNICA DE MADRID	*E*	*P*
TELEFONICA SISTEMAS S.A.	*E*	*P*

Start Date: 16-JAN-89 *Duration: 18 months*

EUROPEAN WORKSTATION (EWS)

PROJECT NUMBER: 2569

Impressive development in distributed systems indicate that in the 1990s workstations will play an even more crucial role than they do now in enhancing the productivity of engineers and scientists. At present, the market for such products is dominated by US companies, and Japan shows growing interest in competing in this area. Europe lags significantly behind. The EuroWorkStation (EWS) project aims to provide a competitive European response by the 1990s: the industrial partners within the EWS project are committed to bringing EWS machines to the market.

EWS is based upon an open modular architecture. Modularity is provided at three different levels: shared memory, communication bus and local area networks. This hierarchy allows appropriate trade-offs to be made between cost and performance. Shared memory is used for high performance communications such as, for example, numerical applications where scalar and vector processing interfere. A communication bus is used for more autonomous coprocessors, where special efforts are invested in message-based communication mechanisms.

Until recently, workstations were based on off-the-shelf 32-bit microprocessors. In 1987, RISC technology made its way from superminicomputers to workstations: the Sun-4 is probably the best-known such basic workstation, with Silicon Graphics, for example, providing 3-D graphics capabilities. RISC architectures now have the lead in performance for CPUs.

To be competitive in the 1990s, research and development projects need to move one step further. High performance special-purpose hardware will soon be available as a part of scientific workstations (coprocessors) as well as in the form of back-end multiprocessor machines. In both cases large amounts of data are produced and have to be presented to and manipulated by the user. 3-D and 4-D (ie. animated) colour graphics are an appropriate mechanism to this end.

The EWS project proposes to introduce the LIW concept at the workstation level. This concept is an extension of the RISC principles since it can increase the number of instructions per cycle. Moreover, such techniques are very much in use for microcode purposes in current supercomputers and accelerators (FPS, NUMERICS, etc.).

Performance gains can be achieved by two main independent measures :

- a reduction in cycle times in proportion to finer feature sizes, with associated lower gate delays

- special (parallel) architectures tailored to a relatively small range of applications.

RISC and possibly VLIW approaches limit the design effort involved in producing these custom architectures. If a modular workstation provides a standard coprocessor communication system (CCS), performance can easily be boosted by adding special coprocessor boards according to the needs of the user. All that

is required from the coprocessor is adherence to the CCS standard; its internal architecture can be derived from and optimised for the application area.

The OS of the workstation needs to be distributed to allow uniform and efficient sharing of the specific resources provided by the specialized coprocessor boards. Since the OS which serves as a basis for the EWS is designed to support task distribution over a LAN, it needs to be especially optimised to take advantage of the closer coupling of the heterogeneous hardware components within the workstation provided by the system bus. The OS will therefore be based on a message-passing service (the Coprocessor Communication System (CCS)), taking advantage of the facilities provided by the hardware bus (Multibus II) and providing interprocess communication facilities (IPC) for easy cooperation of user processes being executed on the various components of the workstation. The EWS workstation will comply with existing communication standards (OSI and INTERNET). File sharing, remote execution and printing, and access to other equipment and sites will be provided.

European cooperation in the EWS project is expected to bring together an international task force to develop a European workstation including new coprocessors, operating system features and a coprocessor communication system and, as final goal, the prototype of a high performance technical workstation architecture. Integration into an established product line is planned. The results of the EWS project will provide a sound basis for short-term product developments and market introduction.

As a major IT manufacturer in Europe, Siemens sells a wide range of data-processing hardware and software products. In order to extend this range, high performance technical workstations and coprocessors, as well as system and application support, are of central interest. GIPSI-2 expects tangible results from the EWS project to develop its future workstation products. The project should deliver a usable prototype of a vectorizer, which Bull plans to transform into an industrial product. Chorus Systemes plans to integrate the results of the project into its product line, and especially the optimised low-level communication system. Grupo APD will incorporate the developments made within EWS into their main product, after completing the necessary steps to progress from a prototype software package to a final product.

Contact Point

Dr. P. Muller-Stoy
Siemens AG 2T 2TI SYS
Ottohahn Ring 6
D - 8000 MUNICH

Tel: +49/89-63646750
Tlx: 521090
Fax: +49/89-63645450

Participants	**Country**	**Role**
SIEMENS	*D*	*M*
GIPSI-2	*F*	*P*
BULL	*F*	*P*
FHG AGD	*D*	*P*
GRUPO APD	*E*	*P*
RUTHERFORD APPLETON LABS	*UK*	*P*
BRUNEL UNIVERSITY	*UK*	*A*
INRIA	*F*	*A*
INESC	*P*	*A*
CHORUS SYSTEMES	*F*	*A*
ZGDV	*D*	*S*

Start Date: 01-JAN-89

Duration: 24 months

ADVANCED DISPLAY OPTIMISATION TOOLS (ADOT)

PROJECT NUMBER: 2638

The ADOT consortium consists of six parties, representing major users of displays, related system designers, a major display manufacturer and leading visual perception academic institutions.

The aim of the three-year work programme is to research and develop design tools for the optimisation of advanced display performance at the visual-display interface in IT products. This work is needed because there is a lack of acceptable quantitative display design criteria. The design tools, in the form of a computer program for a desk-top workstation, will consist of a database, mathematical models and metrics, evaluation methods and guidelines. Together with simulators, these utilities will assist the visual interface designer in:

- optimising display parameters with due regard to visual performance and the environment

- specifying the requirements for future advanced displays

- comparing display types on a consistent basis to make the best use of existing and potential display technologies.

Flat-panel display (FPD) manufacturers are currently faced with the problem of producing high resolution, high brightness, large format displays capable of full-colour imagery and complex symbology. In order to optimise display characteristics it is necessary to understand the relationship between the specification of the physical output from a display and the effects of such a specification on human vision.

The scope of the programme is purposely restricted to specific visual tasks such as the perception of symbology on complex, textured backgrounds typical of digital mapping and 3-D animation for simulation, and the manipulation of displayed text for office systems. The proposed work plan has three main work areas:

- Colour and Motion Perception

  Experiments will be carried out to provide guidelines for quantifying chromatic image quality, emphasising the spatial artefacts of flat panel displays, the optimum combination of parameters required to perceive continuous motion, and the development of a colour space for luminous displays which can represent correctly the ease with which high-contrast information can be seen.

- Development of Design Tools

  Quantitative design criteria and guidelines will be developed from the results of the first work area. This will involve a systematic process of data reduction necessary for the formulation of metrics. These will be implemented in a computer program which will also be capable of emulating some physical characteristics for selected display technologies. The work will use the results and simulator from ESPRIT project 1593.

- Demonstrators

  Five demonstrations will form the major deliverable items and will show how the results of the project can be used to solve practical display problems facing the Community. These demonstrations will be carried out on a range of sophisticated existing workstations.

The tools developed will be essential for the accurate specification of future displays, allowing development in this area to proceed more rapidly and cheaply than could otherwise have been possible. In part, this will have been facilitated by the joint development of acceptable design criteria between display manufacturer, systems designer and user, as represented by the consortium and the international standing of its members. The use of a common design basis will be an important asset in the development of a European FPD market by promoting greater homogeneity of display characteristics and acceptable user requirements.

The partners will use the design tool for their own numerous applications where coloured graphic and symbolic information is to be displayed. This will involve the use of flat-panel displays in many IT products, including workstations, to facilitate human-computer interaction, and simulators. Markets of particular interest are those for advanced information displays to assist command and control systems for aerospace, naval and land vehicles, including driver training, together with document handling systems for the office and workplace.

Contact Point

Mr. Peter L. Phillips
BRITISH AEROSPACE P.L.C.
Sowerby Research Centre FPC 267
P.O. Box No 5
Filton
UK - BRISTOL BS12 7QW

Tel: +44/272-366259
Tlx: 449452
Fax: +44/272-692055
Ekm: Steven Searle SRC

Participants	**Country**	**Role**
BRITISH AEROSPACE	*UK*	*M*
CITY UNIVERSITY	*UK*	*P*
OCE-NEDERLAND BV	*NL*	*P*
SOGITEC INDUSTRIES	*F*	*P*
TNO RESEARCH INSTITUTE	*NL*	*P*

Start Date: 01-MAR-89

Duration: 36 months

VISUAL ARTS SYSTEMS FOR ARCHIVING AND RETRIEVAL OF IMAGES (VASARI)

PROJECT NUMBER: 2649

The VASARI Project aims at opening the way for the European IT industry to achieve a dominating position in an important world niche market of the 1990s: the artistic image processing market. By clearly demonstrating the feasibility and benefits of high resolution and high quality digital image processing techniques, the VASARI project aims to provide a major stimulus to the European IT industry.

The 30-month project is user-driven and concentrates on three important application domains:

- colour change measurement and control of paintings
- painting transportation damage assessment
- computer-aided learning in the arts field.

Focus on the problems associated with work in these domains ensures a practical orientation to the main project effort, which is to specify and build global artistic image processing prototype systems for the acquisition, storage and manipulation of high-resolution images in the three application areas. But although the prototype will be developed with an eye on the specific needs of the arts field, it should also have applicability in other fields such as geography and crystallography.

The main direct outcome of this project should be a major follow-up programme involving major European IT companies and aimed at extending the R&D carried out. The goal would be to develop industrial stage prototypes of artistic image processing systems for exploitation in the mid-1990s, capitalising on Europe's strong natural advantage and cultural history in the arts.

Contact Point

Dr. J.R. Hemsley
BRAMEUR LTD.
237 High Street
UK -Aldershot, Hants GU11 1TJ
Tel: +44/252-313437
Fax: +44/252-225880

Participants	Country	Code
BRAMEUR LTD	*UK*	*M*
BIRKBECK COLLEGE - UNIVERSITY OF LONDON	*UK*	*P*
TUEV - MUNICH	*D*	*P*
THOMSON INFORMATIQUE	*F*	*P*
BAYERISCHE STAATSGEMALDESAMMLUNGEN	*D*	*P*
EIKON	*I*	*A*
DIRECTION DES MUSEES DE FRANCE	*F*	*A*
NATIONAL GALLERY	*UK*	*P*
ENST	*F*	*S*
SYSECA	*F*	*S*

Start Date: 03-JUL-89 *Duration: 30 months*

MULTIPOINT INTERACTIVE AUDIOVISUAL SYSTEM (MIAS)

PROJECT NUMBER: 2684

MIAS is a project in the field of multipoint audiovisual telecommunications. Until recently, the various telecommunications services have used different networks and equipment. Thus text might be sent by telex, and the spoken word by telephone, with little attempt to combine these services. Thanks to digital transmission and switching, we can expect to see in the future a variety of audiovisual services which combine sound communication, pictures and text in a variety of ways. So that equipment can interwork, however, it is important that a standard framework be provided which describes how the signals are combined and controlled. This framework is generally known as the conversational audiovisual service infrastructure.

The main objective of MIAS is the further development of this signal and protocol infrastructure, building on the results already achieved in this area by the preceding ESPRIT project, MIAC. The adoption of such an infrastructure as a European and world-wide standard will enable the successful introduction of terminals and services based on these concepts.

This objective will be achieved by developing the audiovisual infrastructure and incorporating it in a range of demonstration terminals and network facilities. These will be used for the simultaneous communication of speech, moving pictures and telematic information between users at two or more widely separated locations, via the emerging ISDN. A number of demonstrator terminals will be produced, suitable for further development into product form; these will be made available for human factors evaluation and for use by PTTs and the CEC. The demonstration itself will be of a multipoint multimedia system with visual and office system aids and will additionally show interworking between different types of terminal. It will demonstrate the potential facilities which can be offered and show the synergy which can be produced between office tasks, videoconferencing and videotelephony. Transmission costs will be minimised by choosing the minimum bit rate needed for each particular facility.

An important feature of the MIAS project is the development of the multipoint aspects of this type of communication. With many companies operating between diverse sites there is an increasing user need for simultaneous interactive communications facilities involving more than two locations. Whereas the MIAC project prepared the groundwork using a single 64 kbit/s channel for audiographic conferencing, MIAS will make use of both the ISDN and higher bit-rate systems to provide a whole range of compatible multipoint facilities including videoconferencing. Since most telecommunications systems were designed for point-to-point operation, the multipoint operation of such services introduces new technical problems, which the partners will be working to solve.

Exploitation of the project results will be achieved by the partners developing a variety of products in conformance with the standard. As the partners will be at the forefront of the standardisation process, they will be in an advantageous position to make immediate use of the standards agreed. This route to exploitation has been used most successfully in the past in related fields, where European standards have been subsequently adopted worldwide, with consequent benefits for product exploitation. In particular, it will enable European companies and PTTs to offer a full multipoint service coincident with the availability of terminals and the ISDN.

Contact Point

W.J. Clark
BT RESEARCH LABS
Martlesham Heath
UK - IPSWICH IP5 7RE

Tel: +44/473-642006
Tlx: 988811
Fax: +44/473-643791

Participants	**Country**	**Role**
BRITISH TELECOMMUNICATION PLC	*UK*	*M*
CIT-ALCATEL	*F*	*P*
AMPER	*E*	*P*
CNET	*F*	*P*
CSELT	*I*	*P*
TELEFONICA CTNE	*E*	*P*
DNL	*NL*	*P*

Start Date: 01-FEB-89

Duration: 24 months

MORE INFORMATION?

If you require more information, please contact:

COMMISSION OF THE EUROPEAN COMMUNITIES

DGXIII/A2

Telecommunications, Information Industries and Innovation
ESPRIT INFORMATION
200 Rue de la Loi
B-1049 Brussels

Tel: +32 2 235 16 03
Fax: +32 2 235 38 21
Tlx: 21877 COMEU B

or

COMMISSION OF THE EUROPEAN COMMUNITIES

DG XIII/E5

Telecommunications, Information Industries and Innovation
Ref: ESPRIT
200 Rue de la Loi
B-1049 Brussels

Tel: +32 2 235 09 90
Fax: +32 2 236 27 23
Tlx: 21877 COMEU B