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THE COMPUTER SOCIETY OF ZIMBABWE

by Mr. Geoff Fairall *

Zimbabwe's computer "industry" was born in 1960 with the arrival of a first-generation computer, which was installed at the Government Treasury Department. Four years later, there was a sufficient number of installations in the region to warrant holding a Central African computer-users' conference. But it was only in August 1974 that the Computer Society was formed, with an initial membership of 150.

Members were drawn from commerce, industry, government and university, with a wide variety of computer-related occupations. This broadly based membership structure has persisted, with the advantage of promoting close communications between the various skill areas in the information processing industry,

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* representative of the Computer Society of Zimbabwe to IFIP

IFIP TASK FORCE ON MICROPROCESSOR CARDS (SMART CARDS)

The microprocessor card (also called the "smart card") is a device, frequently the size of a conventional credit card, that contains integrated circuit chips. These cards can be used to perform a variety of computer-related tasks in areas such as financial transactions and personal database activities. It has been predicted that by 1993, over 200 million cards will be produced annually. IFIP's interest in this area dates back to 1987, when the conference "Smart Card 2000" was held in Vienna, sponsored by the Technical Committee on Security and Protection in Information Processing Systems (TC11). The activity continued under commercial auspices, but no permanent, scientific activity exists in this area at present.

In March, during the **IFIP** Technical Assembly (TA) meeting that preceded the Council meeting in Barcelona, Prof. Vincent Cordonnier (F) presented a committee report on the microprocessor card and the role **IFIP** might play in this new field of information processing. The report was well received, and the TA requested *Prof. Cordonnier* to lead a Task Force charged with initiating activities in this area and planning how **IFIP** should organize such activities in the future. Following are sections of the original committee report.

History

Although the main patents are over ten years old, the real technical and commercial activities related to microprocessor cards started only in 1984-1985. At that time, several manufacturers started offering a certain number of products that were reliable and reasonably priced and aimed at a limited number of applications. These can be called the first-generation microprocessor cards. The first users were Telecommunication Administrations in Europe, some Social Security Administrations, and a few professional groups — e.g., banking and insurance — and there were some limited experiments (student cards, health cards, and city-transport-fare cards).

These experimental applications proved both the great interest in the device and the functional limitations of the first-generation cards. That led to the development of a second generation. The major areas of technical improvement are memory size, sophisticated data management, processing speed, data security, and the capability for a given card to handle new, not yet fully-defined, applications. This was the first step toward the definition of a

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Prof. *Angel Alvarez,* IFIP trustee and Spanish representative to IFIP's General Assembly, was born in 1947 in Cistierna, Spain. He holds an Industrial Engineering degree from the Technical University of Madrid (1969), a Master of Computer Science from the University of Southern California (1974), and a Doctorate in Industrial Engineering from the Technical University of Madrid (1980).

From 1969 to 1972, he worked as a control engineer in industry, in Madrid. He attended USC from 1972 to 1977, thanks to a Fulbright-Hays grant. As a software expert in Beverly Hills from 1973 to 1977, he had the opportunity to consult for many aerospace firms in the Southern California area.

His university career started in 1977, after he returned from the U.S. He was at the Facultad de Informatica de Madrid until 1987, first as an Assistant Professor, and later as an Associate Professor. Currently, he is an Associate Professor in the Department of Telematics Engineering of the Technical University of Madrid. His fields of interest are mainly in the software area, in which he has lectured and conducted experimental research in operating systems, distributed systems, and real-time programming. In addition, his special interest in real-time programming led him, in 1987, to become the founding president of Ada-Spain, an association currently including some 500 individual members.

Prof. Alvarez's involvement with IFIP started in 1986, when he was appointed representative from Spain to the General Assembly. Previously, he was a member of the Board at FESI, the Spanish Federation of Informatics Societies, representing ATI, the largest member society. In IFIP, he currently chairs both the Site Evaluation and the Congress Guidelines committees. He was elected trustee in 1988.

He enjoys music, movies, and literature — fiction in particular. Together with his wife Lorraine Wise, also a computer specialist, and their son Daniel, six years old, he is always looking for opportunities to tour around the countryside and taste the local cultures.

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smart card as a general-purpose tool in the field of data processing.

These new developments started in 1987-1988 and resulted in the current availability of some original products, extending the domains of application of the card. The estimated number of smart cards produced in 1990 is over 70 million. It is likely that this number will be multiplied by three before 1993. But the most significant development is the requirement for more powerful components, especially because of the increasing number of portable data files being used. While in 1990, 91% of the microprocessor cards were used for financial transaction applications, it is expected that in 1993, only 50% will be so used and that 25% will be used for applications involving portable databases.

The major technical issues involved are:

- physical standards
- micro-chip design
- communication interface and protocols
- external devices
- data security
- software problems
- application development techniques
- integration into large information systems
- ethical and social issues

Of course, this list of issues is not complete, but it clearly indicates that the card raises key problems in many vital areas of informatics.

Security

Until now, cards offered security as a result of the applications being strongly encapsulated. No doubt, more ambitious cards or applications will require new concepts and new techniques. For example, a multi-application health card will be used by physicians, nurses, hospital administration and services, social security, emergency services, etc. Much of the stored data must be shared by more than one user — but, of course, not all of it. A complex security scheme has to be provided.

A big security issue is the proof that the bearer of the card is the correct one. Personal Identification Numbers (PINs) are frequently used with banking cards and other similar applications. The future microprocessor card will improve the quality of the proof and the security level by using one or more biometric identification schemes. Those schemes must be dynamic, to prevent "aging" of initial measurements.

Right now, programs are stored in a ROM, but microprocessor cards could be flexible enough to allow the owner to "import" new applications himself or take copies from his bank, company, or hospital. Then, the security problem focuses not only on data but also on code. As everyone knows, viruses can cause great damages to PCs or mainframes. But what about a virus in a million banking cards? Future microprocessor cards must be able to protect their data files and programs with on-card security virus-control hardware or ROM software, to prevent any modification or loss.

IFIP's Role

Many existing IFIP Technical Committees and Working Groups are directly concerned with some of the issues raised by the card. By its nature, its technology, or the tools it uses, the card concept cuts across their scope. The time is probably right for IFIP to take the complete measure of the microprocessor-card field along the themes developed in this report and others.

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but the disadvantage of attempting to meet the professional and educational needs of so many disparate groups.

The current membership comprises:

120 Members
190 Associate Members
400 Affiliate Members
20 Student Members
200 Institutional Members

The two original chapters based in Harare and Bulawayo continue to cater for the members in the two main cities, but attempts to form chapters in smaller centres have not been successful so far. This is viewed with some concern, as there is an increasing amount of training and education taking place in smaller locations, where the input and influence of the Society could be in the national interest.

A Secretariat has been established in Harare, which acts as the focal point for communications within the Society.

The Constitution of the Society sets out the aims, which principally focus on the intention to educate and inform members of the Society as well as members of the public in matters pertaining to information processing. In keeping with these aims, the Society has developed a regular program of events including:

- Monthly talks or discussion forums arranged by the chapter committees for members and interested persons, providing a regular meeting place and social contacts.
- An annual residential "Summer School" especially for Society members.
- Annual Information Processing Management Workshops, also residential, organised by the Harare Chapter committee. These workshops provide high-level training for information processing managers.
- Annual public seminars aimed at businessmen and government officials.

From time to time, the Society also collaborates with other organisations and government to hold regional workshops.

Members of the Society were responsible for the early introduction of formal computer education at the technical colleges in Harare and Bulawayo, initially providing the necessary lecturers and examiners. Later, these national diploma courses were progressively taken over by the colleges themselves, and the Society's role is now purely an advisory one.

Almost since inception, both chapters have been active in secondary schools, supporting teacher education and computer clubs and, more recently, being represented on committees seeking to formalise the introduction of computer education in schools. This is a comparatively new feature in Zimbabwe's educational system, with extremely few schools possessing computer equipment.

Most post-school computer training is provided by private organisations, and, in an endeavour to promote quality training and protect the public from unethical practices, a scheme was introduced in 1988 whereby training establishments are invited to seek accreditation to the Society on a voluntary basis. At present, only the establishments are accredited and not, as yet, the courses offered.

As a result of its involvement at a national level, the Society already enjoys significant recognition, and its activities are limited only by the voluntary nature of its membership.

Since 1987, the Society has been a full member of **IFIP.** It is also formally affiliated to the British Computer Society and the Association for Computing Machinery (ACM) in the U.S.A.

The Society has been the main promoter of the new, regional confederation, Africa Regional Computer Confederation (ARCC), which will begin operating later this year. ARCC is already planning a major regional event for 1992, to be held either in Mocambique or Botswana. It is hoped that more societies from neighbouring countries will join the group, thus making it more viable and effective. The Society considers the international and regional avenues opened up by these affiliations to be an important factor in its efforts to advance and improve the information processing industry in Zimbabwe and the region. ■

IFIP PUBLICATIONS AVAILABLE

New **IFIP** workers should be aware of the availability of the following **IFIP** publications from the **IFIP** Secretariat:

- Information Bulletin
- Statutes and Bylaws
- Standing Orders
- *What Is **IFIP?***
- 6-Year Plan (list of planned **IFIP** events)
- WG Chairman's Handbook
- Event Approval Guidelines
- Policy on Working Conferences
- Publications Policy
- Guidelines for Editors of **IFIP** Working Conference Proceedings

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Kindly submit material for the *Newsletter* three months before the publication date.
Please send the following **IFIP** information directly to the Secretariat: announcements of conferences, workshops, and other meetings; calls for papers; appointments to committees and other positions; and changes of address. The Secretariat is the clearinghouse for all such information; it will forward it to the *Newsletter.*

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HIGH-SPEED NETWORKING

WG6.4 Holds Conference in Berlin

The Third IFIP conference on "High Speed Networking" was held 18-22 March 1991 in Berlin. Sponsored by the Working Group on Local Computer Networks (WG6.4), this conference attracted 225 participants from 23 countries to discuss various aspects of interconnecting computers with links capable of transmitting data at very high speeds. *Prof. Andrë Danthine (B)* and *Prof. Otto Spaniol (D)* were chairmen of the International Program Committee, and *Mr. Volker* Tschammer *(D)* was chairman of the Organizing Committee.

We found that the four invited papers gave an interesting perspective of the major concerns and concepts in the field of high-speed networks today. Selections from these papers follow.

The first invited paper, by *Dr. Paul* Green (USA), was entitled "Exploiting Photonic Technology for Gigabit Computer Networks."* It discussed the future of fiber-optic communication and the state of the art in that field. Following are selections from the introduction:

Fiber Optics

> Fiber-optic communication is only twenty-five years old, but it would be difficult to exaggerate the impact it has already had on all branches of information transmission, from spans of a few meters to intercontinental distances. This strange technology, involving, of all things, the transmission of messages as pulses of light along a thread of glass, is effectively taking over the role of guided transmission by copper and, to a modest extent, the role of unguided, free-space radio and infrared transmission.
>
> And yet, if one looks **a bit** more closely **at** how this supposedly revolutionary technology has been used to date, one comes away with a sense of vast, unexploited opportunities. The bandwidth is ten orders of magnitude greater than that of phone lines (30,000 GHz versus 3 KHz), and the bit error rate can also be ten orders of magnitude better (10^{-15} compared to 10^{-5}). When one combines these numbers with the great potential cost reductions, it is so clear that fiber is so much more promising than anything communication engineers have ever had to play with before that it seems that much more can be done with photonic communication than is being done today.
>
> One sometimes gets the impression that the only real applications that have been found for this remarkable medium are those that substitute fiber for copper within the framework of some existing architectures. The performance is improved, the cost goes down, but the system is basically what it was before fiber optics came along.
>
> One can define three generations of lightwave networks as follows:
>
> 1. Fiber not used.
>
> 2. Fiber used in traditional architectures. Examples include Fiber Distributed Data Interface (FDDI) and Dual Queue Dual Bus (DQDB). These substitute fiber for copper but make only minor changes in the topology.
>
> 3. Fiber used for its unique properties. Here one asks, "How can the nonclassical properties of fibers be employed to meet the needs of emerging applications, by taking new approaches?" For example, how can one make use of the ten orders of magnitude improvement in error rate and bandwidth?
>
> Of course, the answer depends on what problem one is trying to solve with the network. As this symposium so amply demonstrates, there is emerging, as we approach the end of the century, an entirely new set of gigabit applications. These applications are quite varied, depending in part on whether the physical topology is simply a point-to-point link, a point-to-multipoint structure, or a full network.
>
> The most prominent link application is as a long-haul common-carrier trunk. Such trunks already handle more than a gigabit per second of traffic. How do we upgrade this for the day when *each user* wants a gigabit?
>
> Point-to-multipoint structures, one degree more complex topologically, are expected to provide "fiber to the home" or "fiber to the office," carrying the multiple bitstreams of High-Definition TV, digital audio, and other emerging applications.
>
> At the level of networks, the gigabit applications are appearing first in the local environment of LANs (local-area networks) and MANs (metropolitan-area networks). Already, there is an urgent requirement in university and other research environments for supercomputer support of hundreds or thousands of high-performance workstations with live-motion color graphics.

Dr. Green went on to discuss how to share the fiber capacity among the nodes, topologies, technologies, protocols, network control, and interconnection. He mentioned a prototype third-generation network, called "Rainbow," being developed. He concluded as follows:

> The state of today's lightwave technology is such that LANs and MANs providing 1 Gb/s sustained capacity for each of 1000 nodes will be practical within three to five years, certainly for circuit-switching, and probably for packet-switching. If the opportunity is exploited with imagination, the positive effect on network architectures and on applications to be supported will be profound.

The second invited paper, "The Evolution of XTP"* by *Dr. Greg Chesson* (USA), discussed the Xpress Transfer Protocol (XTP), a new communication protocol designed to exploit new protocol features, such as reliable multicast, seletive retransmission, and parametric addressing in a design suitable for VLSI implementation and 10 to 1000 megabit/s media. The design of XTP has been going on for three years, based on work done in the 1970s and 1980s. The bulk of the paper was devoted to the Protocol Engine VLSI architecture. The introduction to the paper indicated the significance of computer networks to the field of information processing:

Significance of Networks

> The quantity of network and protocol research can be measured by observing the number of publications in the area. In the 1960s and the early 1970s, most of the papers published in the biennial ACM SIGOPS Proceedings (Association for Computing Machinery Special Interest Group on Operating Systems) were devoted to operating

* © IFIP

system topics like paging, process control, and file management. By the 1980s, the balance changed, so that most of the papers presented some aspect of networking in the context of operating systems.

The third invited paper was "Design and Use of High-Speed Networks in Multimedia Applications"* by ***Dr. Andy Hopper*** (GB). The paper dealt with video and audio display and recording media interconnected by high-speed networks. The introduction began as follows:

Multimedia Systems

When considering multimedia systems, it is important that one look at both the different networks and different devices in use. The devices vary from simple, portable units to high-quality displays and provide different levels of quality of service to the user. A systems approach is required that combines optimum use of the networking infrastructures with the multimedia devices.

Mr. Hopper proceeded to describe the type of applications possible with various combinations of devices and network capacity, as well as a prototype system, "Pandora," with an experimental workstation and experimental applications. Here are further quotations from the paper:

Pandora experience suggests that in a large enough group, a user may use the two-way video phones 25 times in an 8-hour working day, with each call lasting an average of 3 minutes. For video-mail applications, it is likely that the same user will generate 25 video-mail messages of 30 seconds each, and that these will be looked at an average of 35 times. This is slightly more than the average number of text mail files produced today, but in comparison, video mail is considerably faster to generate (if not view).

For video-mail applications, further compression can be applied if the files are to be sent to places where a high-speed network is not available. It is interesting to note that, if we allow a user to retain 100 video-mail files of high quality, the capacity of the file server is 1.2 Terabytes for the system under consideration. It may be useful to do this only if on-line search techniques for video files are developed that permit easy retrieval of video. In the mean time, the size of the file server can be much reduced by using virtual memory techniques and mass storage like digital audio tape (DAT).

The multimedia applications described above make it clear that the bandwidth being provided by new networks will have no difficulty in finding an application.

The final invited paper, "B-ISDN and the OSI Protocol Reference Model"* by ***Martin*** De Prycker, ***Robert*** Peschi, and ***Thierry Van Landegem*** (all from Belgium), proposed a mapping of the Broadband Integrated Services Digital Network (B-ISDN) protocol reference model onto the OSI (Open Systems Interconnection) one. The introduction contained some generally informative material:

Broadband ISDN

Today there are plenty of telecommunications networks, very heterogeneous in nature and service-specific: consider for instance the case of telephony, telex, cable TV, etc.

Beside obvious political and commercial reasons, each network was introduced to support a well-identified and specific application in an optimised way. Unfortunately, in the past, technology was not able to offer a common networking solution for the whole applications spectrum.

The first telecommunication network was exclusively tuned for voice, from its introduction through all evolution steps. When the need for long-haul data transfer arose, a dedicated data network naturally followed its own parallel way. On their side, LANs, supporting local data transport, followed another way, and so on.

A first push towards network integration came with the Narrowband ISDN (N-ISDN), able to integrate voice, data and low-grade video (64 Kbit/s to 2 Mbit/s) on the digital voice network. However, the achieved integration, even if it does represent a positive step, is limited in its ambitions. The N-ISDN is not suited to offer faster services (e.g., broadcast video or very high-speed data transfer for LAN interconnection). Rather, N-ISDN can be seen as the most intelligent way to exploit the last generation voice networks in terms of cost efficiency and service offering.

If we envisage a universal network, it must be able to provide a large number of services. Therefore, the transfer mode for this universal network cannot be designed specifically for one service. There is a large range of services, with an estimated bit rate of a few bit/s up to some hundreds of Mbit/s. Also the holding times vary from seconds up to hours.

Clearly the need for a more flexible network, faster and smarter, still holds. This is the target of the B-ISDN.

These papers, as well as 20 others, can be found in the Conference proceedings, edited by Professors ***Danthine*** and Spaniol and just published by Elsevier/North-Holland.

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[The following entry was inadvertently omitted from the "TC6 Snapshot" on page 7 of the March 1991 ***IFIP*** *Newsletter.]*

WG6.4 Co-Chair.: Prof. Guy Pujolle
Position: Head of MASI Laboratory
Employer: University Pierre and Marie Curie
Location: Paris

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COUNCIL OF EUROPEAN PROFESSIONAL INFORMATICS SOCIETIES (CEPIS)

*by Mr. Aage Melbye (DK) **

[We print this article because of the interest **IFIP** has in CEPIS, as demonstrated by the discussions held during the March Council meeting in Barcelona (see the June 1991 ***IFIP** Newsletter,* page 6). The article appeared in the first issue of the magazine *Informatika 12* early this year and has ' been edited for the *Newsletter.* — Ed.]

CEPIS is the acronym for the Council of European Professional Informatics Societies. This new organisation has been formally constituted as a result of discussions between a number of informatics societies in Europe during the last two years

The creation of CEPIS stems from the convergence of different developments in Europe such as:

• The European General Directive on mutual recognition of professional qualifications between member states.

• Increasing interest throughout Europe on legal aspects impacting or impacted by informatics, such as computer misuse, data protection, and software copyright

• Growing concern to expand the opportunities for informatics professionals from different countries to cooperate on issues of common interest across Europe, especially in light of the Single Market

• Concern to ensure that European institutions, e.g., the European Commission, the European Parliament, and the Council of Europe, have available to them the best sources of independent professional knowledge in the field of informatics

History

Following informal contacts between some of the major European informatics societies, the British Computer Society (BCS) invited the Chief Officers from all the societies in the European Community to a meeting in London in November 1988. As a result, a number of specific areas of interest that could benefit from close cooperation were identified. It was decided not to formalise the group, but to meet again at different places at six-month intervals.

In September 1989, it was decided to form the group into a Council and to notify the European Commission of the formation and mission of CEPIS, paraphrased as:

> To provide a coordinated European voice that is able to represent the views of European informatics professionals on major issues to European institutions, both by invitation and at the initiative of CEPIS

In October 1990, a provisional draft Constitution was presented, and the final CEPIS Constitution was adopted in April 1991 by the following 14 European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Spain, Switzerland, and United Kingdom. Since then, Hungary has been accepted as a Full Member and Poland as an Associate Member.

Achievements

A major achievement has been the consensus regarding the Constitution. This includes the main objectives of CEPIS which, briefly stated, are:

• To promote the common interests of the national informatics communities of Europe

• To contribute to the development of European legislation in the light of the continuing evolution of informatics

• To stimulate the use of informatics for facilitating the European communications infrastructure

Full membership of CEPIS is open to national professional informatics societies, or national groups of such societies, with the restriction that there shall be only one Full Member for each member state in the Council of Europe. Other membership categories include Associate Membership, (for countries that are applicant states to the Council of Europe), and Affiliate Membership (for other international organisations in support of cooperative relations).

Another major achievement has been the establishment of four pan-European Task Forces to address particular issues of importance:

• *Professional Issues* (led by the British Computer Society): for harmonising professional development and qualifications, and raising the standards of informatics education and training across Europe. Work is progressing on the development of an accepted European Informatics Skills Structure, and this has attracted significant financial support from the European Commission.

• *Legal Issues* (led by the Nederlands Genootschap voor Informatica): for assembling a European inventory of national legislation on Computer Misuse and Data Protection

• *Technical Issues* (led by the Irish Computer Society): for establishing stronger links between CEPIS member societies in the areas of reciprocal membership, conferences, Special Interest Groups, and publications

... *Social Issues* (led by the Osterreichische Computer Gesellschaft): initially for expanding European cooperation on informatics aid to the disabled

Additional Task Forces are under consideration.

Challenges

The main challenge for an organization such as CEPIS is the opportunity to enhance the evolution of the informatics profession in Europe.

Some may argue that informatics is not yet established as a profession; many of those employed today in informatics have not received an extensive formal education in the subject; those who have benefited from such an education reflect many different backgrounds and widely differing perceptions as to the most relevant kind of formal education that should be required for today's informatics professional; the terminology applied in informatics is not as consistent as may be found in more mature disciplines; even the term "informatics" is not universally accepted; those working in the informatics area do not have the same influence on their working conditions as may be found in the more well established professions such as medical, legal and other fields.

How this profession evolves will depend, among other things, on how well the professional informatics societies succeed in offering attractive services and how well they are able to cooperate across geographical, organisational and other boundaries. But that is one of the challenges that CEPIS will be able to address.

* Danish representative to CEPIS and IFIP, and IFIP treasurer

IFIP Working Group 5.11 on Technology for the Environment

In 1990 in Buenos Aires, IFIP's Technical Assembly proposed new activities associated with the relationship of information and ecology, which would involve cooperation between the Technical Committees on Computer Applications in Technology (TC5) and Relationship between Computers and Society (TC9). Because this field is beyond the usual scope of TC5, it has been difficult to recruit new members for a proposed Working Group (WG). As a result, TC5 has taken the somewhat unusual step of issuing the following Call for Members.

Motivation

A healthy and safe environment is becoming a prevalent aspiration of industrialized countries. The problem is assuming a cultural and political proportion that was unthinkable till a few years ago. Emotional response to potentially dangerous country-wide or world-wide "natural" events has developed a defensive mentality responsible for terms such as "territorial protection," "soil defense," "ecology preservation," and "environmental challenge." The essential objective consists in finding the correct synthesis between natural values and technological progress: What is needed is a productive dialectic between environment conservation and the injection of innovative technologies favoring development, changes, and new life methodologies.

Informatics and related technologies can play an active role in this context, providing the basic tools and systems architectures for active monitoring, environment modeling and simulation, territory mapping, spatial and temporal evolutionary forecasts, and decision-providing systems.

The involvement of TC5

TC5, as a whole, is active in many of the required technological areas, namely computer graphics, knowledge-based systems, sensors and real-time control, user-interface, computer architectures, multidisciplinary systems, etc. It seems therefore natural that a WG will be established to address the "environment" subject. Because of the heavy involvement of the human being, both as the subject and the object, joint activities with TC9 are desirable. Specific collaborations are moreover foreseeable with other **IFIP** TCs (e.g., TC2 on Software: Theory and Practice and TC6 on Data Communication) and Affiliate Members (e.g., Very Large Data Bases Endowment [VLDB]) and with the **IFIP** Member societies.

Aims and Scopes

A comprehensive list of objectives and topics has been drafted by TC9 for its WG (called "Informatics and the Environment"). It has been agreed with the TC9 Chairman that the aims and scopes of the two WGs should be similar, TC5 taking care mostly of the technological aspects and TC9 emphasizing the social aspects. Specific WG5.11 Scope and Aims are as follows:

SCOPE

To investigate existing methods and applications of Computer-Aided technologies to environmental engineering, to exchange ideas and information on current developments of the subject matter, and to advance the issues raised through publications, conferences, and other means.

AIMS

The scope will be realized by focusing on important sub-areas that will be addressed through specialized TC5 Working Conferences. The sub-areas include, but are not limited to

- Mapping systems
- Protection of cultural and artistic heritage
- Environment protection (air, water, land)
- Hazardous waste treatment
- Facilities design and management
- Public utilities networking

Scheduled Activities

A joint TC5—TC9 workshop has been scheduled for September 1992 in Madrid, as part of the **IFIP** World Congress.

Suggested names of candidates may be sent to the TC5 chairman at the address below or conveyed to him through other **IFIP** officers or representatives.

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WG13.1 SCOPE AND AIMS

In March in Barcelona, the **IFIP** Technical Assembly approved the following Scope and Aims for the first Working Group of Technical Committee 13 on Human-Computer Interaction (HCI).

WG13.1: Education in HCI and HCI Curriculum

AIMS:

- Enhance international collaboration in disseminating knowledge about this rapidly developing and important subject
- Improve HCI education at all levels of higher education
- Coordinate and unite efforts to enhance the development of HCI curricula
- Recommend fundamental structures for curricula and course materials and for their adaptation to various national educational systems
- Advance international recognition of qualifications in this field
- Promote the teaching of HCI

SCOPE AND TASKS

The Working Group will build upon existing work in **IFIP** Member countries to include:

- Evaluation of the needs of industry to enhance the qualifications in HCI, based upon societal objectives to improve the work environment
- Collation of existing curricula, course literature and other relevant materials developed by Member societies or by institutions that are contributing to their work
- International exchange of information about curricular aspects of HCI and their further development
- Design of recommendations and guidelines for HCI curricula at different levels of higher education, and the adaptation of the guidelines to the cultural situation within which the respective education system is based

In developing its work, WG13.1 is expected to cooperate appropriately with TC3 (Education) and its relevant Working Groups.

To Organizers **of IFIP** Conferences:
Please send several copies of your Calls for Papers to the **IFIP** Secretariat, in order that the staff may be able to handle queries.

IFIP TECHNICAL COMMITTEE 3: EDUCATION

How should you use computers in the classroom when the classroom is the dirt under the banyan tree? What do you do with a single computer in a school? The former question was recently addressed to *Dir. Peter Boilerslev (DK),* chairman of IFIP's Technical Committee on Education (TC3). The latter question was the title of a conference held by TC3 in Bulgaria in 1989. These questions illustrate the complexity of the issues faced by TC3. Not only does TC3 deal with the pedagogical and technological aspects of computers and education, but it considers economic, social, political, psychological, and other aspects as well.

The immense scope of TC3 (teaching about informatics to computer professionals, computer technicians, and others; using computers to teach; teacher training; and other topics) is demonstrated by the diversity of backgrounds of the people who participate in TC3 activities. University professors, elementary school teachers, designers of educational software, and many other professionals attend TC3 conferences, belong to its Working Groups (WGs), and follow its activities. You don't have to be on the faculty of a world-class university to have an interest or competence in many aspects of TC3's work. This contributes to the richness of TC3's work but creates a problem at the same time: financing TC3 events that all interested parties can attend. Public school teachers, in particular, find it nearly impossible to get funds to support their attendance at technical conferences. They often pay their own transportation, accommodations, and conference registration expenses, which limits the distance they can travel. People from developing countries, who can benefit greatly from participation in TC3 activities, are faced with similar financial problems. TC3 attempts to alleviate these difficulties by charging very low registration fees and arranging inexpensive accommodations for conferences attended by those with funding difficulties.

TC3 was founded in 1963, under the chairmanship of *Prof. Richard Buckingham (GB).* TC3's original intent was to develop curricula for university computer courses, to certify such courses, to provide guidelines for teacher training, and to run six-month courses for teachers from developing countries. The stress has always been on the educational aspects of informatics; technological matters play a secondary role.

In later years, a major contribution by TC3 was the Modular Curriculum for Informatics, developed in behalf of Unesco. Produced in the early 1980s, this model syllabus was translated into many languages and widely distributed by Unesco.

Clearly, TC3 has evolved significantly since its founding in 1963. At the beginning, it was primarily concerned with concrete, practical work in education. Now it is looking for new, theoretical areas to investigate. This is reflected in the current TC3 Scope and Aims "...to identify new needs and areas for educational activities in information processing." WG3.3, for one example, originally worked on Computer-Aided Instruction (CAI) but is now called Research on Education Applications of Information Technologies, representing a far broader scope.

The activities of TC3 are truly international, and its members come from around the globe. In a recent conversation with this reporter, *Dir. Bollerslev* and the prior TC3 chairman, *Prof. Wilfried Brauer,* noted with pride that a representative from the Virgin Islands is at virtually every conference, as is the corresponding member from Iceland. They said that the first **IFIP** event ever held in Iceland (at which the president of Iceland greeted the delegates), was sponsored by TC3.

TC3 has sponsored five World Conferences on Computers in Education, which attract large numbers of participants — 2300 at the most recent WCCE in Australia in 1990. (By comparison, 1600 people attended **IFIP** Congress '89 in San Francisco.) The next WCCE will be in Birmingham, U.K. in 1995.

The Working Group on Informatics Education at the Secondary Level (WG3.1) has always tried to be on the forefront in its field. Its initial work concentrated on education about algorithms and logic used in computer programs. Now WG3.1 is concerned with using the computer as a tool both in the educational process and for the teacher.

WG3.2, Informatics Education at the University Level, is at the leading edge in its field. It is concerned with university education in informatics for both computer scientists and non-computer-professionals. It deals with education about both computers and the use of computers. It asks how to use the latest hardware and software (including artificial intelligence techniques). One question being asked is how much (if anything) do we need to teach users about computers if the software is good enough (user friendly, etc.).

WG3.3 on Research on Education Applications of Information Technologies, which was re-constituted in 1988, concentrates on research issues regarding the use of computers for teaching (by an instructor, to impart desired knowledge) and for learning (by the student, to acquire information). The psychological aspects are a major interest of WG3.3

WG3.4 on Vocational Education and Training deals with the practical application of computers to teaching and learning in a vocational education environment. The WG is also concerned with the certification of graduates of schools of computer-related vocations.

WG3.5 on Informatics in Elementary Education (elementary schooling is for children up to about age 12) deals, for the most part, with the integration of the use of computers into the teaching of existing subjects in elementary schools. These teachers face difficulties with finding funds and being released from school in order to attend **IFIP** conferences and meetings, as well as with the **IFIP** rule that conferences be held in English.

WG3.6 on Distance Learning (Open Universities, correspondence schools, and others) deals with a variety of issues: application of computers in distance-learning institutions, use of computer and communication technology to educate at a distance, education about informatics through distance-learning institutions, and other issues. Many exciting possibilities exist — e.g., combining CAI techniques and teleteaching, video conferencing, and computer conferencing. This work is clearly on the forefront of educational techniques.

What future activities are in the works for TC3? There are several issues with which TC3 is concerned at present. For example, in order to encourage the training of women in informatics fields, it has been proposed that the technical education of girls and boys be segregated. Since in many cultures

continued on page 13

IFIP TC3

Determines new needs for educational activities related to information processing, by analyzing technology and the world. Is concerned with education about information processing (at all grade levels) and with the use of information processing to teach. Prepares model curricula and standards for accreditation. Has especial interests in informatics and education in developing countries.

TC3 Chairman: Director Peter Bollerslev
Position: Director of Center for Applied **Informatics** in Teacher Education
Employer: Ministry of Education
Location: Copenhagen
Interests: educational, psychological, and pedagogical aspects of informatics; teacher education in mathematics and informatics

TC3 Vice-Chairman: Professor Robert Aiken
Position: Professor, Computer Science Department
Employer: Temple University
Location: Philadelphia
Interests: artificial intelligence (especially applied to education), intelligent tutoring systems, curriculum development, teacher (re)training, computers and society

TC3 Secretary: **Mr. Brian Samways**
Director of ISS Training Centre
Employer: Birmingham **City** Council, Education Department
Location: Birmingham, U.K.
Interests: computing in schools and colleges, professional development of personnel, accreditation, writing, lecturing, research in use of laser disks in schools

TC3 Vice-Chair.: Prof. Dr. Rita deCaluwe
Position: University Professor, head of Computer Science Laboratory
Employer: State University of Ghent
Location: Ghent, Belgium
Interests: education of computer scientists, database and expert systems engineering using fuzzy logic

Working Group 3.1: Informatics Education at the Secondary Level Studies the teaching of informatics in secondary schools, and the necessary teacher education. Also studies the impacts of informatics on education in other subjects and on educational organization.

WG3.1 Chairman: Mr. Tom J. van Weed
Position: Dean of the Undergraduate School of Informatics
Employer: University of Nijmegen
Location: Nijmegen, The Netherlands
Interests: informatics education at the university level, education in software engineering, educational organization

Working Group 3.2: Informatics Education at the University Level Works on curricula development and on the impact of computers on university education in all disciplines.

WG3.2 Chairman: Prof. Bernard Levrat
Position: **Director of** Computing Services
Employer: University of Geneva
Location: Geneva
Interests: computing, networks, man-machine communication, CAI, computers and society

Working **Group 3.3: Research on Education Applications of Information Technologies** Identifies issues and priorities for research, and stimulates research in the application of science (computer, psychological, and educational) to education.

WG3.3 Chairman: Professor Robert Lewis
Position: Coordinator of IT in Education Research
Employer: Univ. of Lancaster
Location: Lancaster, U.K.
Interests: computer-mediated cooperative learning in children and for the professional, continuing education, barriers to innovation

Working Group 3.4: Vocational Education and Training Deals with curricula, methodology, planning, requirements, future needs, qualifications, accreditation regarding education and training of Information Technology professionals and advanced end-users.

WG3.4 Chairman: Dr. Ben Zion Barta
Position: Chief Inspector on Computers in Education
Employer: Israel Ministry of Education and Culture
Location: **Jerusalem**
Interests: general, national policies for Computers in Educational Systems, with special interest in education of Information Technology professionals and end-users

Working Group 3.5: Informatics in Elementary Education Studies all aspects of computer application in elementary schools.

WG3.5 Chairman: Mr. Erling Schmidt
Position: Inspector for Educational Computing
Employer: **Municipal Authority of Aalborg**
Location: Aalborg, Denmark
Interests: curriculum development, research in education, cross-curriculum use of computers, in-service training of teachers

Working Group 3.6: Distance Learning Promotes distance learning for teaching informatics in open universities and for post-graduate courses.

WG.3.G. Chairman: Mr. Gyözö Kovacs
Position: Director, Senior Consultant, Board Member
Employer: SZAMALK Computing Applications and Service Co.
Location: Budapest
Interests: distance learning, new educational technologies, multimedia systems, computer history and business

"ONE-OF-A-KIND" PRODUCTION

The International Working Conference on "New Approaches towards 'One-of-a-Kind' Production" will focus on the problems and potential of one-of-a-kind production — i.e., made-to-order production of nonstandard products. The development needs in project management, product design, engineering, and production system design will be emphasized. The Conference, sponsored by IFIP's Working Group on Computer Aided Production Management (WG5.7), will be held 12-14 November 1991 in Bremen, Germany.

Today's trend towards customized products and complete solutions is reflected in an increasing product complexity as well as in a constant expansion of product range and variety. The decreasing product life cycle leads to ever shorter innovation periods, and increased product range leads to more complex operational procedures. How can planning and control be carried out for time and cost optimum under these conditions?

In the extreme case, one-of-a-kind products have to be designed and manufactured correctly on the first attempt. For this, production equipment and systems have to be designed for an ever broader product range. Suitable planning and organization become integral starting points, in order to utilize computers for the design and manufacturing of one-of-a-kind products.

The final results of a multinational, collaborative research project of seven members of WG5.7 will be presented at the Conference. The project, entitled "Towards an Integrated Theory for Design, Production, and Production Management of Complex, One-of-a-Kind Products in the Factory of the Future (FOF)," is aimed at the integration of various scientific disciplines involved in the design of production systems and is limited to one-of-a-kind production. It is a basic research project in the ESPRIT program launched by the Commission of the European Communities.

For further information, please contact the Conference chairman:

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GROUP ON CONTINUOUS COMPUTATIONAL COMPLEXITY HOLDS FIRST MEETING

*by Prof. Joseph Traub (USA) **

The **IFIP** Study Group on Continuous Algorithms and Complexity held its first meeting at Schloss Dagstuhl, near Saarbrucken, Germany, during the week of April 15. The Study Group is part of the **IFIP** Specialist Group on Foundations of Computer Science (see the article on page 9 of the June 1990 ***IFIP** Newsletter).* Thirty-six researchers from Austria, China, Germany, Italy, Poland, U.S.A., and U.S.S.R. attended the meeting.

This rapidly growing field studies optimal algorithms for the solution of continuous mathematical problems that often arise in science and engineering. (By complexity, we mean the intrinsic difficulty of the problems.) Examples of the problems studied include ordinary and partial differential equations, continuous optimization, multivariate integration and approximation, matrix multiplication, and systems of polynomial equations.

Thirty-one talks were presented at the meeting. Among the theoretical topics covered were

- Models of Parallel Computation
- Average Case Complexity of Multivariate Problems
- Complexity of Ill-Posed Problems
- Complexity of Monte Carlo Solution of Integral Equations
- Optimal Solution of Multidimensional Problems
- Complexity of the Symbolic Solution of Differential Equations
- Average Errors of Global Optimization and Zero Finding
- Complexity of Integration
- Complexity of Operator Equations

Among the application topics were

- Computational Transport Theory
- Use of Randomization to Solve Large Eigenvalue Problems
- Signal Processing with Noisy Data
- Complexity of Robust Stability
- Fractal Encoding of Images

Prof. *Joseph Traub* (USA) was elected chairman of the Study Group; Prof. *Arthur Werschulz* (USA) was chosen as secretary. The Study Group discussed future meetings, including the possibility of activities in conjunction with **IFIP** Congress '92 (in Madrid in September).

It was also decided to start an electronic conferencing system for people interested in continuous algorithms and complexity. Prof. *Werschulz* has implemented such a system, called CAC-NET, based on NA-NET, a system used by numerical analysts. To receive information on CAC-NET, including information on how to join, send e-mail to the Internet address cac.help@cs.columbia.edu. If you have questions or comments, send e-mail to cacnet@cs.columbia.edu. Bitnet subscribers should consult their local e-mail specialists to determine how to communicate with CAC-NET. One may also write to

Professor Arthur Werschulz
Computer Science Department
Columbia University
New York, NY 10027, U.S.A. ■

* chairman of Study Group on Continuous Algorithms and Complexity

PROF. SIDNEY MICHAELSON

Sidney Michaelson, founding member of **IFIP's** Working Group on Very Large Scale Integration (WG10.5), died on February 21st at the age of 65.

In 1966, he became the University of Edinburgh's first Professor and Head of the Department of Computer Science, which he built into one of the foremost departments in the world.

Sidney served on many committees in the University and outside, and he played a leading role in establishing and maintaining professionalism within the British Computer Society.

Within **IFIP,** he was known for his interest in VLSI. In 1981 he organised a conference on VLSI in Edinburgh and was an active member of a Task Force that proposed the establishment of WG 10.5 to the **IFIP** General Assembly. In 1986 his contribution to **IFIP** was recognised with the award of a "Silver Core." Due to Sidney's imaginative leadership, WG10.5 has grown to be one of the most successful WGs in **IFIP.** The VLSI series of conferences, which he has bequeathed to **IFIP,** stands as a fitting memorial.

Prof. Roland Ibbett
TC10 correspondent for
***IFIP** Newsletter*

NEW IFIP PUBLICATIONS FROM NORTH-HOLLAND

Collaborative Work, Social Communications and Information Systems

Proceedings of the IFIP TC8 Conference, Helsinki, Hanasaari, Finland, 27-29 August 1991

edited by R. Stamper, P. Kerola, R. Lee *and* K. Lyytinen

1991 xvi + 385 pages
Price: US $ 100.00 / Dfl. 195.00
ISBN 0-444-89211-7

Computer Applications in Production and Engineering

Proceedings of the Fourth International IFIP TC5 Conference on Integration Aspects, CAPE '91, Bordeaux, France, 10-12 September 1991

edited by G. Doumeingts, J. Browne *and* M. Tomjlanovich

1991 xiv + 788 pages
Price: US $ 141.00 / Dfl. 275.00
ISBN 0-444-89159-5

Fractals in the Fundamental and Applied Sciences

Proceedings of the First IFIP Conference on Fractals in the Fundamental and Applied Sciences, Lisbon, Portugal, 6-8 June 1990

edited by H.-0. Peitgen, J.M. Henriques *and* L.F. Penedo

1991 xii + 462 pages
Price: US $ 113.00 / Dfl. 220.00
ISBN 0-444-88757

High Speed Networking, III

Proceedings pf the IFIP TC6/WG6.4 Third International Conference, Berlin, Germany, 18-22 March 1991

edited by 0. Spaniol *and* A. Danthine

1991 x + 328 pages
Price: US $ 89.50 / Dfl. 175.00
ISBN 0-444-89197-8

Intelligent CAD, III

Selected and Reviewed Papers and Reports from the IFIP TC5 Third International Workshop, Osaka, Japan, 26-29 September 1989

edited by H. Yoshikawa, F. Arbab
managing editor: T. Tomiyama

1991 xiii + 350 pages
Price: US $ 97.50 / Dfl. 190.00
ISBN 0-444-89172-2

Knowledge, Information and Medical Education

Selected papers *from the IMIA International Conference, Prague, Czechoslovakia, 3-7 September 1990*

edited by J.H. van Bemmel *and* J. Zvárová

1991 xiv + 462 pages
Price: US $ 107.50 / Dfl. 210.00
ISBN 0-444-88902-7

The Object Oriented Approach in Information Systems

Proceedings of the IFIP TC8/ WG8.1 Working Conference, Quebec City, Canada, 28-31 October 1991

edited by E van Assche, B. Moulin *and* C. Rolland

1991 x + 432 pages
Price: US $ 107.50 / Dfl. 210.00
ISBN 0-444-89209-5

Protocol Test Systems, III

Proceedings of the IFIP TC6 Third International Symposium, McLean, VA, USA, 30 October -1 November 1990

edited by I. Davidson *and* D.M. Litwack

1991 x + 462 pages
Price: US $ 110.50 / Dfl. 215.00
ISBN 0-444-89177-3

Support Functionality in the Office Environment

Proceedings of the IFIP TC8/WG8 3/WG8.4 Working Conference, Canterbury, Kent, UK, 9-12 September 1991

edited by A.A. Verrijn-Stuart, P. Hammersley *and* H.G. Sol

1991 iv + 240 pages
Price: US $ 79.50 / Dfl. 155.00
ISBN 0-444-89223-0

Telematics in Medicine

Proceedings of the IMIA Working Conference, Rotterdam, The Netherlands, 18-21 November 1990

edited by J.S. Duisterhout, A. Hasman *and* R. Salamon

1991 488 pages
Price: US $ 110.50 / Dfl. 215.00
ISBN 0-444-89015-7

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CHANGES IN IFIP

NEW APPOINTMENTS

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M. Granbastian (F)
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succeeding G. Philokypru
I. Kerner (D)
succeeding W. Brauer
and D. Schubert
I. Stanchev (BG)
succeeding B. Sendov

TC6: Prof.Hu Dao-Yuan (PRC)

WG6.1:
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P. Kritzinger (ZA)
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G. Koch (I)
J. Meditch (USA)
R.A. Mohler (USA)
N. Telksnys (Lithuania)

WG10.5:
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TC11: Mr. G. Eizenberg (F)

WG11.3:
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J. McDermid (GB)
M. Morgenstern (USA)
L. Notargiacomo (USA)
E. Sibley (USA)
B. Thuraisingham (USA)
V. Varadharajan (GB*)
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G. Barth **(D)**
Prof. J.-G. Ganascia (F)
E. Hollnagel (DK)
B. Lepape (B)
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CORRECTIONS

TC6 vice-chairman: Prof. Dr. 0. Spaniol
e-mail: spaniol
@rwthinf.informatik.rwth-aachen.de

Mr. P. van den Besselaar is secretary of WG9.1 (not WG9.2) ■

TC3 continued from page 9

women are discouraged from technical careers, educating them in separate classes might permit women to receive the appropriate encouragement to enter such careers. Another issue is how to keep TC3 integrated with the other **IFIP** TCs.

Since education is a concern of all TCs, how should this component of TC3 that is orthogonal to the other TCs be organized?

But *Dir. Bollerslev* believes that the main concern of TC3, at present, should be greater involvement with developing countries. Although TC3 frequently holds events in developing countries (e.g., a seminar on Information Technology and Training was held in Zimbabwe preceding the 1991 **IFIP** General Assembly), Bollerslev feels that a concerted effort to become more active in developing countries in Latin America, Africa, and Asia is essential. We look forward to seeing the flowering of this effort. ■

FUTURE IFIP MEETINGS

GENERAL ASSEMBLY AND COUNCIL (and related meetings)

TC2	14-15 Aug 92	Ellivuori, Finland
WG2.1	late 91 or early 92	Rio de Janeiro
	Sep 92	Germany
WG2.2	Mar 92 (with State-of-the-Art Seminar)	Bombay
WG2.3	29 Sep 91	Pouilly-en-Auxois, France
WG2.4	Sep 91	Victoria, British Columbia
WG2.5	mid Sep 91 (with conf.)	Karlsruhe, Germany
WG2.6	Oct 91	Vienna
WG2.7	Sep 91	Le Sappey en Chartreuse, France
	Aug 92 (with conf.)	Ellivuori, Finland
WG2.8		Santa Fe, New Mexico
TC3	5-6 Sep 92 (before IFIP Congress '92)	Madrid
	Jan 93	Mexico
	28-29 Aug 93	Birmingham, U.K.
	26-27 Aug 94	Hamburg
	22-29 Jul 95	Birmingham, U.K.
TC5	8 Sep 91 (with CAPE conf.)	Bordeaux
WG5.7	11 Nov 91	Bremen, Germany
TC6	22-23 Nov 91 (with COMTAP conf.)	Port Stephens, Australia
	20-21 Mar 92	Helsinki
	24-25 Sep 92	Nice
	Mar 93 (with conf.)	Capetown
	15-16 Oct 93	Sofia
WG6.1	19-22 Nov 91 (with FORTE 9lconf.)	Sydney
WG6.5	22 May 92 (with conf.)	Vancouver, Canada
TC7	2 Sep 91 (with conf.)	Zurich
TC8	5-6 Sep 92 (before IFIP Congress '92)	Madrid
WG8.1	1 Nov 91 (with conf.)	Quebec City
	13-15 Apr 92 (with conf.)	Alexandria, Egypt
WG8.2	15 Dec 91	New York
WG8.3	10-12 Sep 91 (with conf.)	Canterbury, U.K.
WG8.4	10-12 Sep 91 (joint meeting)	Canterbury, U.K.
TC9	5-6 Sep 91 (with IFIP Congress '92)	Madrid
WG9.6	12 Oct 91	Bergen aan Zee, Netherlands
	7 Mar 92	U.K. or Brussels
TC10	7 Jan 92	Lyngby, Denmark
	8-10 Sep 92 (with IFIP Congress '92)	Madrid
WG10.4	Feb 92	Hawaii
	10-13 Jul 92	Cap Cod, Massachusetts
	Feb 93	Captiva, Florida
	Jun 93	Toulouse region, France
TC13	6 Sep 91 (after HCI 91 conf.)	Stuttgart

* Some meetings are scheduled in conjunction with Working Conferences, for which the conference dates are listed.

Will TC and WG chairmen kindly keep the Secretariat advised of the dates and locations of their future administrative meetings and also send a copy of the minutes to the Secretariat.

CALLS FOR PAPERS

Seventh IFAC/IFIP/IFORS/IMACS/ISPE Symp. on Information Control Problems in Manufacturing Technology — INCOM'92
25-28 May 92, Toronto
papers due: 30 Aug 91
contact: Mrs. Nicole Leger
INCOM '92
National Research Council Canada
Montreal Road
Ottawa, Ontario, Canada K1A 0R6
tel: 1 (613) 993-9431
fax: 1 (613) 957-9828
telex: 053-3145

TC12 Working Conf. on Low Quality Information (LQI)
11-13 Mar 92, Montpellier, France
papers due: 15 Sep 91
contact: Laurent Siklossy
Postbus 71710
NL-1008 DE Amsterdam, Holland

WG5.3 Conf. PROLAMAT'92
24-26 Jun 92, Tokyo
abstracts due: 30 Sep 91
contact: Conference Secretariat — PROLAMAT'92
c/o Japan Society of Precision Engineering
Ceramics Building, Hyakunin-Cho 2-22-17
Shinjuku-ku, Tokyo 169, Japan
tel: 81 (3) 3362 4030
fax: 81 (3) 3367 0994

TC6 Intl. Conf. on Information Networks and Data Communication — INDC-92
16-19 Mar 92, near Helsinki
papers due: 1 Oct 91
contact: Martti Tienari
Univ. of Helsinki
Teollisuuskatu 23
SF-00510 Helsinki, Finland
tel: 358 (0) 708 4175
fax: 358 (0) 708 4441
telex: 122 785 tsk SF
e-mail: tienari@cs.helsinki.fi

Seventh World Congress on Medical Informatics — MEDINFO 92
6-10 Sep 92, Geneva
papers due: 15 Nov 91
contact: MEDINFO 92 Administrative Office
Symporg SA
108, route de Frontenex
CH-1208 Geneva, Switzerland
tel: 41 (22) 786 37 44
fax: 41 (22) 786 40 80 ■

Editor's New E-mail Address

Please note that the Internet e-mail address of the ***IFIP*** *Newsletter* editor has been changed. The new address is

rosenj@watson.ibm.com

National Abbreviations Used in Newsletter

AUS Australia
B Belgium
BG Bulgaria
CDN Canada
CH Switzerland
D Germany
DK Denmark
E Spain
F France
GB United Kingdom
GR Greece
Italy
IND India
IRL Ireland
J Japan
N Norway
NL The Netherlands
P Portugal
PRC China
SEARCC South East Asia Regional Computer Confederation
SF Finland
USA U.S.A.
WRN Nigeria
ZA South Africa

CORRECTION

The article "Technology Transfer to Latin America" on page 7 of the June 1991 ***IFIP*** *Newsletter* contained a statement of conference goals written by the Organizing Committee. The author wishes it noted that this does not represent the views of the International Program Committee. ■

CALENDAR OF EVENTS

(continued from page 16)

Event	Date	Location	Sponsored by
Work. Conf. on *Information System Concepts — Improving the Understanding — ISCO*	13-15 Apr 92	Alexandria, Egypt	WG8.1
Seventh Symp. on *Information and Control Problems in Manufacturing — INCOM '92*	25-28 May 92	Toronto	IFAC/ TC5
Eighth Intl. Conf. on *Computer Security — IFIP/SEC'92*	27-29 May 92	Singapore	TC11
Conf. on *Measurement & Modelling of Computer Systems — SIGMETRICS 92*	1-5 Jun 92	Newport, Rhode Island	ACM SIGMETRICS/ IFIP TC7.3
Fifth Symp. on *Man-Machine Systems*	9-11 Jun 92	The Hague	IFAC/ WG5.2/10
Work. Conf. on *The Portable Office I: Microprocessor Cards as Elements of Distributed Offices*	9-11 Jun 92	Ottawa	IFIP WG8.4
Eighth Intl. Conf. on *Software for Discrete Manufacturing — PROLAMAT '92*	24-26 Jun 92	Tokyo	WG5.3/ IFAC JSPE IPSJ
Work. Conf. on *Professional Development of Information Technology Professionals*	1–? Jul 92	Singapore	WG3.4/ Sing. Comp. Soc.
Fifth Work. Conf. on *Engineering for Human-Computer Interaction*	*10-14* Aug 92	Ellivuori, Finland	WG2.7
Seventh Conf. on *Dynamic Modelling of National Economies*	18-20 Aug 92	Beijing	IFAC/IFORS IIASA IFIP
Eleventh IAPR Intl. Conf. on *Pattern Recognition*	30 Aug-3 Sep 92	The Hague	IAPR
Seventh World Congress on *Medical Informatics — MEDINFO '92*	6-10 Sep 92	Geneva	IMIA
IFIP Congress '92 — Twelfth World Computer Congress	***7-11*** Sep 92	Madrid	IFIP
Work. Conf. on *Dependable Computing for Critical Applications — DDCA* 3	14-16 Sep 91	Mondello, Sicily	IFIP WG 10.4/ TC11, IEEE CS TC on FTC, EWICS TC7
ICCC '92	27 Sep-2 Oct 92	Genoa	ICCC
Workshop on *Geometric Modelling*	31 Dec 92–?	Budapest	TC5
Conf. on *Feature Modelling and Recognition for CAD/CAM Systems*	31 Jan–? 93	Valenciennes, France	WG5.3/ AFCET
Work. Conf. on *Computational Techniques of Stochastic Programming*	1–? Feb 93	Seregelyes, Hungary	WG7.7/ IFAC
Workshop on *Knowledge Based Hybrid Systems in Manufacturing*	1–? Apr 93	Genoa	WG5.3
Ninth Intl. Conf. on *Computer Security — **IFIP/SEC'93***	***1–?*** May 93	Canada	TC11
Intl. Conf. on *Teleteaching '93*	14-18 Jun 93	Trondheim, Norway	TC3
Work. Conf. on *Computer-Based Training and Hypermedia in Vocational Education*	1–? Jul 93	Soest, Germany	WG3.4
VLSI '93	31 Jul–? 93	Grenoble	WG10.5
Work. Conf. on *Statistical Aspects of Stochastic Programming*	31 Jul–? 93	Prague	WG7.7
Thirteenth Intl. Joint Conf. on *Artificial Intelligence — Ii CA II **'93***	29 Aug-3 Sep 93	Chambery, France	IJCAII
Workshop on *Large Scale Stochastic Programs: Applications and Solutions*	*1–?* Oct 93	Yalta	WG7.7
Conf. on *Network Information Processing Systems*	12-14 Oct 93	Sofia	TC6/Bulg. Acad. of Sciences
IFAC World Congress '93	31 Dec 93–?	Sydney	IFAC
Workshop on ***Stochastic Methods and Global Optimization***	1–? Mar 94	Lithuania	WG7.7
IFIP Congress '94 — Thirteenth World Computer Congress	29 Aug-2 Sep 94	Hamburg	IFIP
Workshop on *Expert Systems in Computer Integrated Manufacturing*	31 Dec 94–?	Kiev	WG5.3
World Conf. on *Computers in Education — WCCE '95*	24–? Jul 95	United Kingdom	TC3/BCS
Thirteenth *IFAC World Congress*	31 Dec 96–?	San Francisco	IFAC

Please see page 14 for schedule of IFIP administrative meetings.
The IFIP Secretariat can furnish details of most of the events listed.

CALENDAR OF EVENTS

Event	Date	Location	Sponsored by
Intl. Conf. on *Computers in Automation of Shipyard Operations — ICCAS '91*	1–? Sep 91	Rio de Janeiro	WG5.6
Fifteenth Conf. on *System Modelling and Optimization*	2-6 Sep 91	Zurich	TC7/ AFCET IFORS OeGOR SVI/FSI SVOR/ASRO
Fourth Intl. Conf. on *Human Computer Interaction — HCI'91*	2-6 Sep 91	Stuttgart	IAO/Purdue Univ. **IFIP** TC13
Seventeenth Organizing Committee *Very Large Databases — VLDB '91*	3-6 Sep 91	Barcelona	VLDB
Workshop on *Support Functionality in the Office Environment*	9-12 Sep 91	Canterbury, U.K.	WG8.3/WG8.4
Fourth Organizing Committee *Computer Application in Production and Engineering — CAPE '91*	*10-12* Sep 91	Bordeaux	TC5
Fourth Work. Conf. on *Reliability and Optimization of Structural Systems*	11-13 Sep 91	Munich	WG7.5
Conf. on *Information Technology for Advanced Manufacturing Systems — ITAMS '91*	17-19 Sep 91	Nanjing, Jiangsu, China	WG5.3
Work. Conf. on *Programming Environments for High-Level Scientific Problem-Solving*	23-27 Sep 91	Karlsruhe, Germany	WG2.5
Intl. Conf. on *CAD/Computer Graphics — CAD/GRAPHICS 91*	30 Sep–? 91	Hangzhow, China	Chinese Comp. Fed./ WG5.10
Fourth Work. Conf. on *Intelligent CAD IV — INTCAD '91*	30 Sep-3 Oct 91	Columbus, Ohio	WG5.2/ ACM SIGART
Second Work. Conf. on *Visual Database Systems*	30 Sep-3 Oct 91	Budapest	WG2.6
Work. Conf. on *Informatics at the University Level: Teaching Advanced Subjects in the Future*	3-5 Oct 91	Zurich	WG3.2/UNESCO, ACM
Work. Conf. on *Shaping Organizations and Shaping Technology — SOST '91*	8-9 Oct 91	Adelaide	TC9/ ACS
Intl. Conf. on *Open Distributed Processing — IWODP*	8-10 Oct 91	Berlin	TC6/IIR, GMD-FOCUS
Second Workshop on *Distributed Databases in Real-Time Control*	9-13 Oct 91	Rydzyna, Poland	IFAC/ WG5.4
Purdue Intl. Workshop on *Industrial Computer Systems*	21-24 Oct 91	West Lafayette, Indiana	WG5.4/ Purdue
Work. Conf. on *The Object Oriented Approach in Information Systems — 00A*	28-31 Oct 91	Quebec	WG8.1
Intl. Work. Conf. on *Database Security*	4-7 Nov 91	Shepherdstown, W. Va.	**IFIP** WG11.3
Work. Conf. on *New Approaches Towards "One-of-a-Kind" Production*	12-14 Nov 91	Bremen	WG5.7/BIBA & Directorate General X111–CEC
Intl. Workshop on *Relationship between Synthesis, Test and Verification*	*15-16* Nov 91	Berkeley, California	WG10.5
Fourth Intl. Conf. on *Formal Description Techniques — FORTE '91*	19-22 Nov 91	Sydney	WG6.1
Work. Conf. on *Process Planning for Complex Machining with AI-Methods*	27-29 Nov 91	Dresden	WG5.3
Twelfth Annual Intl. Conf. on *Information Systems — ICIS'91*	16-18 Dec 91	New York	ICIS/SIM, TIMS, ACM, **IFIP** TC8
Intl. Workshop on *Designing Correct Circuits — DCC '92*	6-8 Jan 92	Lyngby, Denmark	**IFIP** WG10.5/WG10.2
Work. Conf. on *Stochastic Programming: Stability and Numerical Methods*	*1–?* Mar 92	Wendisch-Rietz, Ger.	WG7.7/ Humboldt Univ.
Work. Conf. on *Low Quality Information Processing*	11-13 Mar 92	Montpellier, France	CRIM/WG12.3 INRIA, USTL
Fourth Intl. Conf. on *Information Networks and Data Communication — INDC '92*	16-19 Mar 92	Espoo, Helsinki	TC6
Work. Conf. on *Configurable Distributed Systems — WCDS .*	25-27 Mar 92	London	IEE/ **IFIP** WG2.4, U.S. Naval Office Research Eur.
Intl. Work. Conf. on *Information-Decision-Action Systems in Complex Organizations*	6-8 Apr 92	Oxford	IEE/ **IFIP** WG8.3
Purdue Intl. Workshop on *Industrial Computer Systems*	6-9 Apr 92	West Lafayette, Indiana	WG5.4/ Purdue
Work. Conf. on *Stochastic Optimization: The State of the Art*	12-19 Apr 92	Havana	WG7.7/ Univ. of Havana

(continued on page 15)

IFIP Congress '92 — 12th World Computer Congress	7-11 Sep 92	Madrid	**IFIP**
IFIP Congress '94 — 13th World Computer Congress	29 Aug-2 Sep 94	Hamburg	**IFIP**

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